SCHOOL OF MEDICINE

Proposal to Establish a School of Medicine

at the University of California, Riverside

March 4, 2008

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EXECUTIVE SUMMARY

The University of California, Riverside (UCR) intends to establish a School of Medicine that will open in fall 2012. The medical school will develop innovations in research, education, and health care delivery and will improve the quality and availability of health care in Inland Southern California. It also will give special attention to the needs of the medically underserved in the region, building upon UCR's existing record of excellence and diversity. An important foundation for the medical school is the existing UCR/UCLA Thomas Haider Program in Biomedical Sciences (UCR/UCLA Program), which provides the first two years of medical school to students at UCR, who then go on to the David Geffen School of Medicine at UCLA to complete their medical degrees.

The Need

With serious physician shortfalls projected at the national, state, and regional levels, the need for a UCR medical school is well documented. National studies suggest countrywide shortfalls of at least 100,000 physicians over the coming decade.[1] By 2015, the statewide supply of physicians will be an estimated 16 percent less than projected demand – some 17,000 physicians. In the rapidly growing and diverse Inland Southern California region, the shortfall is projected to be as high as 53 percent.[2] Based on this need, the University of California Advisory Council on Future Growth in the Health Professions recommended to the Board of Regents in 2006 that there be a 34 percent increase in UC medical student enrollment by 2020, with a comparable increase in medical resident enrollment.[3] In its final report, issued in January 2007, the Council recommended that this growth be accomplished by increasing enrollments at existing schools and by planning for at least one new UC school of medicine that would graduate its first class by no later than 2020.[4]

Responding to the Need

To help meet this projected need, the UCR School of Medicine requires an upfront investment by the state of California of $100 million in operating funds during the start-up and growth phases. In addition, UCR will seek state assistance in funding a significant portion of the $500 million in instructional and research facilities that will be required to support the school. The medical school is projected to become self-sustaining in 2021, with an annual operating budget of $87 million (in 2006-07 dollars), not including clinical revenue and expense.

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[1] *Key Physician Data by State*, Association of American Medical Colleges Center for Workforce Studies Report, November 2007

[2] *A Report to: The Office of Health Affairs, University of California*; Presentation, Edward Salsberg, Center for Health Workforce Studies at Albany, State University of New York, December 2003

[3] http://www.university ofcalifornia.edu/regents/minutes/2006/edpol1106.pdf

[4] *A Compelling Case for Growth, Special Report of the Advisory Council on Future Growth in the Health Professions*, January 2007, http://www.ucop.edu/healthaffairs/FINAL%20Report%20January%202007.pdf

Mission

The mission of the UCR School of Medicine is to improve the health of the people of California and, especially, to serve Inland Southern California by training a diverse workforce of physicians and by developing innovative research and health care delivery programs that will improve the health of the medically underserved in the region and become models to be emulated throughout the state and nation.

Vision

The vision of the UCR School of Medicine is to:

- Educate and retain a diverse physician workforce needed to help address the underserved patient care needs of the people of California and, in particular, the Inland Southern California region;
- Develop a platform for an expanded biomedical health and clinical sciences research program to advance knowledge in the medical sciences;
- Recruit a diverse student body and faculty that reflect the demographics of California; and
- Contribute to the region by enhancing the clinical delivery system through relationships with community hospitals, physicians, and other providers, as well as attracting and training new physicians.

Goals

To fulfill the mission and vision, the following goals are set forth:

- **To establish a premier school of medicine:** ranking in the top 50 for research and primary care, as do the existing UC medical schools; preparing graduates for distinguished careers in clinical practice, teaching, research, and public service;
- **To build the school upon the highest quality basic, applied, and clinical research:** being competitive for funding from the National Institutes for Health; attentive to research themes that align with the NIH "roadmap;" and
- **To develop an innovative health care delivery system for Inland Southern California that will serve as a model for the nation:** providing expanded health care in this medically underserved region in a novel program that will be emulated elsewhere.

The Model

The innovative model developed for the UCR School of Medicine combines a strong research foundation with a distributed clinical education system. The model will expose students and residents to the practice of medicine in a variety of healthcare settings and populations while, at the same time, instilling an understanding of the role of research in improving medical treatment and drawing upon current and future research strengths at UCR.

Research-Based Foundation – The UCR School of Medicine will be research-based. This is essential to providing a high quality educational experience for students, improving health care delivery to the region, and distinguishing the school. From the outset, UCR aims to become a national leader in biomedical sciences and health care research. Already the campus has a base of approximately 100 faculty conducting research in health-related fields. The school will expand the current research base at UCR through recruitment and retention of nationally respected faculty in the clinical and basic sciences and development of advanced infrastructure to support the research enterprise. Expanded basic science research will be accompanied by robust clinical and health services research emphasizing population health, preventive medicine, and development of scientific knowledge to spur innovations in health care delivery.

Potential research priorities for the School of Medicine include areas of relevance to the state and region, such as cardiovascular diseases, diabetes and metabolic syndrome, emerging infectious diseases, neurodegenerative diseases, and health services research. The business model projects that the research enterprise will be self-sustaining by 2021. (See Part III, Chapter VI for a complete description of the research enterprise and associated costs.)

Distributed Clinical System – The UCR School of Medicine will utilize a distributed clinical system—one which is both consistent with the proposed mission and, at the same time, socially and economically advantageous. Rather than construct its own hospital, UCR will partner with regional hospitals, clinics, and providers for its clinical programs. A distributed model will allow the UCR medical school to train students in a variety of healthcare settings and populations throughout the Inland Southern California region. Because data show that physicians tend to practice where they do their residencies,[5] over time this approach will result in greater access to health care for a broader base of a diverse and currently underserved population. At the same time, the distributed model allows for leveraging existing healthcare resources by partnering with regional hospitals and clinics.

UCR is well aware of the responsibilities for assuring the highest standards of care in all clinical and/or hospital facilities with which it will operate or affiliate. It is also understood that there are particular challenges in assuring quality of care in a distributed clinical model. For these reasons it will be incumbent upon the dean to appoint a quality control officer at the very outset of the school's establishment.

UCR Assets

UCR has a number of existing assets that will be brought to bear on the School of Medicine. They include:

UCR/UCLA Program – This program, in existence for more than 30 years, provides a solid foundation upon which to build, including an existing curriculum, accredited by the Liaison Committee on Medical Education (LCME); an educational infrastructure for the first two years of medical education; and an experienced biomedical sciences faculty that delivers this curriculum in collaboration with local clinicians.

[5] Rosenthal T.C., McGuigan M., Osborne J. 1997. "One-two residency tracks in family practice: Are they getting the job done?" Family Medicine 30:90-3.

Research – Over the past decade, organized mammalian-based research initiatives at UCR have provided research networking opportunities, enhanced the awareness of ongoing research across departments and colleges, spurred successful equipment and graduate training grants, and resulted in the formation of successful new centers. UCR faculty members work on a variety of human diseases, systems, and health-care delivery issues that can serve as the basis for a well-rounded medical school research enterprise. These research efforts are supported by a variety of existing, highly specialized research and instrumentation facilities.

Diversity – *U.S. News and World Report* ranks UCR third in the nation among public research universities for the diversity of its undergraduate population.[6] In 2006, UCR was third among the nine UC general campuses in the percentage of underrepresented minority faculty, with 9 percent. Since 2005, underrepresented minority students have comprised approximately 25 percent of the UCR/UCLA Program enrollment. In addition, the pipeline programs associated with the UCR/UCLA Program (FastStart and the Medical Scholars Program) have had marked success, with underrepresented minorities comprising approximately 60 percent of participants. These programs are described in Part III, Chapter III.

Endorsements – A distinguished External Advisory Board, made up of deans, former deans, and other experts representing UC San Francisco, Harvard Medical School, University of Minnesota, Duke University, UCLA, and the Association of American Medical Schools (AAMC) helped to craft a distinctive academic vision for the medical school. The curriculum has been endorsed by deans of the existing UC medical schools (Appendix H). In addition, the UCR School of Medicine has widespread community support, generating more than 50 resolutions and letters of support from local businesses, community groups, medical associations, and government.

Economic Impact – UCR's economic impact on the state of California is more than $900 million[7], with nearly 70 percent of that impact in Riverside and San Bernardino counties. The addition of a medical school will stimulate additional positive benefits through the creation of new jobs, direct spending by the medical school for goods and services, and generation of additional tax revenue. While the magnitude cannot yet be forecast, national data suggest that Inland Southern California would experience a measurable boost in economic development by the presence of a medical school. According to a recent AAMC report, every dollar spent by a medical school or teaching hospital indirectly generates an additional $1.30 when it is "re-spent" on other businesses or individuals, resulting in a total impact of $2.30 per dollar.[8]

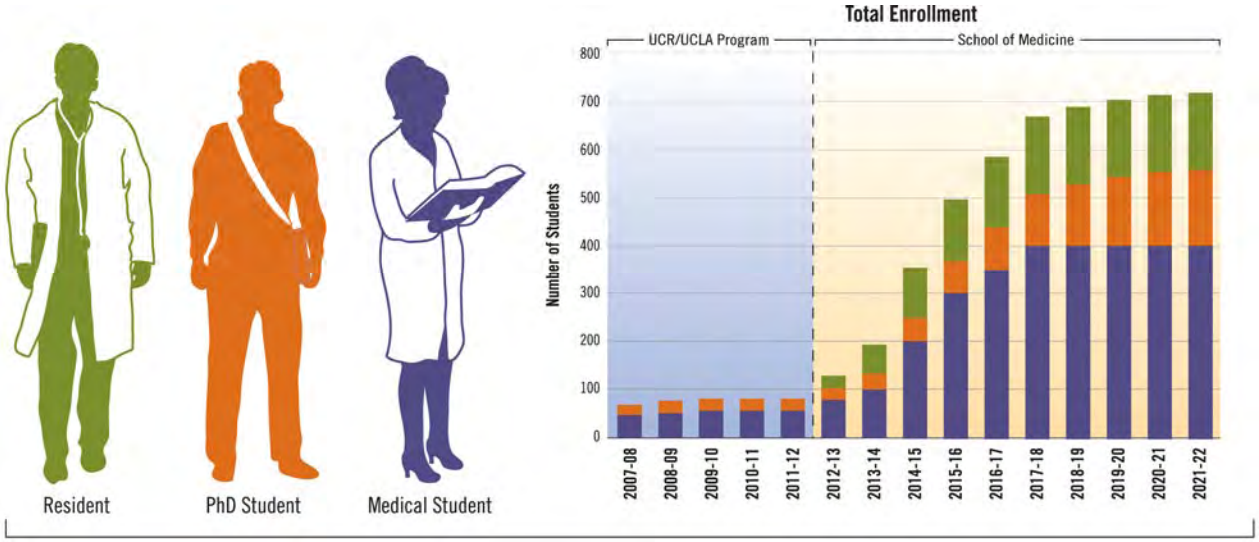
Key Elements of the School of Medicine

Student Enrollment – The first class of students in the UCR School of Medicine will matriculate in fall 2012 with a class size of 50. Enrollment will ramp up to 100 students per class by academic year 2017-18, to a total medical student body of 400 students. In that timeframe, core postgraduate medical education programs (residencies) will grow to 160. Ultimately, UCR plans to expand postgraduate training into other, more specialized training programs and to double or triple the size of the program. To support the research enterprise and

[6] *America's Best Colleges, 2008, Campus Diversity: National Universities*
[7] http://www.impact.ucr.edu/
[8] Tripp Umbach (2006), *The Economic Impact of AAMC Member Medical Schools and Teaching Hospitals, 2005* (Washington, DC: Association of American Medical College, 2007)

to help meet state and national needs for technically trained scientists and engineers, the medical school plans to incrementally increase enrollment of academic graduate students to 160 by 2021-22. The projected enrollment profile for medical students, graduate academic (Ph.D.) students, and residents is shown in Figure i. (See Part III, Chapter I.)

Figure i. Student Enrollment



Faculty – Faculty recruitment will begin prior to the opening of the medical school in order to develop provider affiliations, undertake accreditation initiatives, develop curricular programs, and initiate the research enterprise. At build-out, the medical school will have 138 faculty FTE, based on projected student enrollment and current state-supported student/faculty ratios of 3.5:1 for M.D. students, 18.7:1 for Ph.D. students, and 10:1 for interns and residents. Because some of the 138 FTE will be partial appointments, this will translate into many more individuals. To support the research mission described, the medical school plans to recruit four senior research leaders, who will quickly establish a visible and robust platform for the research enterprise. By 2021, total faculty salaries and benefits will reach $25 million, exclusive of the faculty clinical practice plan, and will represent 29 percent of the total operating budget. (See Part III, Chapter II.)

Diversity – Achieving diversity among its faculty and student body is crucial to the success of the School of Medicine and the attainment of its mission. Consistent with recommendations of various national organizations, such as the AAMC and the Josiah Macy, Jr. Foundation, the school aspires to achieve structural diversity that serves the population of the state of California. The campus further recognizes the need to enhance the educational experience of its students by exposing them to diverse experiences, people, and ideas. This is in harmony with the UC Board of Regents' affirmation in September 2007 that diversity is fundamental to UC's mission and integral to achieving excellence. Since 2005, approximately 25 percent of the matriculating students in the UCR/UCLA Program have self-identified as underrepresented minorities. The UCR School of Medicine will strive to meet or increase the diversity that the UCR/UCLA Program has achieved in the past few years. Graduate student diversity has been identified by the Board of Regents as one of four critical areas for maintaining academic excellence. In accordance with guidelines from the UC Office of the President, the medical school will develop

criteria for decisions on medical and doctoral student admissions and financial support that demonstrate prospective students' contribution to UCR's diversity mission.

Affirmative Action – In accordance with federal regulations, UCR will develop annual placement goals for faculty and postdoctoral scholars. By definition, placement goals are reasonable, attainable objectives that are used to measure progress toward achieving equal employment opportunities. In appointing faculty and postdoctoral scholars, the UCR School of Medicine will consider faculty contributions to diversity and equal opportunity.

Funds have been identified to support the medical school's commitment to diversity and affirmative action. At maturity, nearly $4 million of ongoing operating costs and $15 million of strategic investments have been identified to support faculty recruitment and the following programs and activities.

Pipeline Programs –

- **Haider Program:** This revamped program will matriculate 24 UCR undergraduates each year into the School of Medicine, helping to solidify the pipeline from the Inland Southern California community to UCR, from there to the medical school, and then to potential residencies and eventual practice in Inland Southern California.
- **Health Sciences Partnership (HSP) Program:** The HSP program involves one-on-one or small group counseling and mentoring from UCR science students to disadvantaged 9^{th}-12^{th} grade high school students who are currently enrolled in Health Academy Programs in Inland Southern California.
- **FastStart:** FastStart is an intensive five-week summer residential learning experience designed for incoming UCR freshmen who aspire to medical and other science-based careers. The program's goal is to increase the number of disadvantaged students who pursue health-related careers.
- **Medical Scholars Program (MSP):** MSP is designed to increase the diversity of students who succeed in their B.S. or B.A. training and achieve their goal of entering medical school or allied health disciplines. Throughout the four years, UCR faculty and staff provide individualized student counseling, with attention to academic, career, and personal advising.
- **Postbaccalaureate Program (Postbac):** Postbac has as its goal the recruitment of disadvantaged students with B.S./B.A. degrees who dream of becoming physicians to serve underserved populations, but who need individualized academic and mentorship support to become competitive medical school applicants.

Support Services –

- **Dean's Office and Staff:** The dean's office will include staff and faculty with specific responsibilities for addressing the diversity needs of the medical school. Of note is the position of senior associate dean of diversity, outreach, and community partnerships.
- **Scholarship Funds:** Specific scholarships funded by student fees will be allocated to support the financial needs, and thus reduce the debt burden of economically disadvantaged students. Additional private scholarships will be targeted through fundraising efforts, with an initial target of $10 million in funding.
- **Grants:** Resources have been identified to support the pursuit of grants and awards that fund programs for student retention.

- **Community Involvement in Clinical Education and Training:** Community service projects and community-based clinical training are required in the third and fourth years of the medical education curriculum. These programs will expose UCR students to community health issues in this diverse and growing region.
- **PRIME Student Funding:** The medical school will continue to implement the state PRIME program through student enrollment. This UC wide program is designed to improve the health of underserved communities within the state by offering specialized education, training, and support for students pursuing medical careers focused on caring for the underserved.

Part III, Chapter III provides additional information on diversity and affirmative action.

Curriculum – The proposed curriculum is composed of the first two years of medical school currently offered by the UCR/UCLA Program and an innovative clinical education model for the last two years of medical school. Years 1 and 2, already accredited by LCME, provide a sequentially taught block-based, integrated approach to the science of human biology and disease. Normal human biology is integrated with disease processes and clinical skills, and instruction is driven by cases explored in small groups, laboratories, conferences, clinical skills workshops, and independent study settings. Longitudinal skills courses related to doctoring practices and physical examination will be conducted throughout the first two years.

The clinical years emphasize continuity-of-care experiences in which students are paired with primary care physicians, allowing them to follow patients over time. Students also will have clinical experiences with specialists, community service projects, and special medical academies. In Year 3, students will spend six months in clinical clerkships in which they will have medical-center based experiences, and six months in community-based clerkship experiences. Students will have a community service rotation with exposure to the delivery of medical care in this medically underserved and diverse region, as well as longitudinal courses such as doctoring, imaging, problem-based learning, and case-based education. In Year 4, students will choose to participate in one of four academies, which are societies of faculty and students sharing common career interests. Faculty will provide appropriate career advice and mentoring, coordinate longitudinal experiences, guide choices of electives, and oversee senior projects.

To support delivery of the curriculum, the faculty time required was analyzed based on the need for first- and second-year basic science teaching, and the third- and fourth-year clinical teaching. Associated faculty salaries will be paid through a combination of state funds and grant support. (See Part III, Chapter IV.)

Postgraduate Training Programs – Postgraduate training programs (also referred to as graduate medical education, or GME) will begin in July 2012, prior to the start of the medical student clerkship programs. Faculty leadership must be in place approximately two and a half years prior to the start of the initial residency class in order to establish programs and gain accreditation. Faculty necessary to support GME teaching will grow as the postgraduate training program expands; projections call for 29 faculty FTE by 2017. The medical school also will establish a GME office responsible for the administrative oversight and academic quality of UCR's residency programs. At maturity, the GME program is expected to operate at a break-even level. (See Part III, Chapter V.)

Clinical Enterprise – UCR examined four options for developing a clinical enterprise. They are: 1) hire on a per diem basis private practice physicians who have split employment at both UCR and a clinical setting; 2) develop a network of physicians (through buying practices of retiring physicians or expanding current practices) who represent multiple specialties; 3) establish a network of physicians who will be staffed on a part-time basis at a number of clinics within the community; and/or 4) establish a collaborative arrangement with local private and/or public hospitals where UCR faculty would be members of the medical center. Once the medical school is formally approved, UCR will develop one or more of these options. Until then, a break-even model for the clinical enterprise has been developed. (See Part III, Chapter VII.)

Administration and Support Services – Primary administrative responsibilities for the School of Medicine will reside in the dean's office. In addition, a number of central campus services will provide support to the school and, over time, may require augmentation in order to deliver these services. Operating costs for administration and support services directly related to the medical school are expected to ramp up from $3 million to $15 million annually over the 14-year period of this proposal. Specific needs include the following:

- **Dean's Office:** By 2021, the dean's office structure will have five senior associate deans, an associate dean, an assistant dean, faculty chairs, and staff. The founding dean of the school may elect to change the proposed structure and support model.
- **Medical School Library:** The library for the medical school will provide information and resource access to medical school faculty and students, primarily in the form of electronic resources and information technology. Funding will be allocated to a variety of expense items, with a specific focus on e-resources.
- **Support Services:** Between 2010 and 2022, additional medical school staff will be hired as needed in areas such as admissions, career counseling, personnel services, information management and technology (IT), library, departmental administrative support, and others, until support FTEs reach 122. This level of staffing is consistent with that of other UC medical schools.

Additional details may be found in Part III, Chapter VIII.

Operating Budget

An operating budget has been developed for the UCR School of Medicine, based on the characteristics described above. The operating budget plan projects revenues and expenses for a 14-year period, from 2008-09 through 2021-22. Projections are based on uninflated 2006-07 dollars and do not include clinical revenue and expense. The financial model for the medical school is described in two phases, leading to the point at which the school will be self-sustaining.

Start-up Phase (Fiscal Years 2008-09 through 2011-12) – This phase represents an initial period of investment in preparation for the first class of M.D. students and residents in fall 2012. These investments are necessary to develop the instructional and administrative infrastructure in advance of funding that eventually will be generated by student enrollment. This includes the recruitment of the founding dean, the basic administrative infrastructure, the recruitment of faculty, development of the research enterprise, and the establishment of postgraduate training

programs. Based on revenue and expense projections for this phase, a start-up investment by the state of $23 million is needed in this period. (See Table 18).

Growth Phase (Fiscal Years 2012-13 through 2019-20) – During this phase, the entire enrollment plan will be achieved, and the medical school infrastructure will expand to support that growth. In addition to enrollment, financial modeling assumptions include staffing requirements, non-salary expenses, and revenue funding. Additional state investment required for this period is $50 million. (See Table 19).

Break-even Operations (Beginning Fiscal Year 2020-21) – By fiscal year 2020-2021, the medical school will reach a level of self-sustaining operations of $87 million (excluding the incremental faculty practice plan compensation). At $25 million, enrollment-driven state funds comprise 33.6 percent of total revenue of $74 million. By this time, the school will have reached full build-out, with 138 faculty FTEs, 400 M.D. students, 155 Ph.D. students, and 160 postgraduate students.

The operating budget for the UCR School of Medicine may be found in Part IV, Chapter I.

Capital Program

Capital improvements for the medical school will be realized in two phases: the East Campus transition phase and the West Campus phase as shown in Figure ii. The transition phase anticipates the school opening in 2012, accommodating annual enrollment of 50 students per class and approximately 35 faculty. This will bridge the period between the opening of the school and projected enrollment growth, when additional facilities will be needed. Transition plans include equipping and renovating current Biomedical Sciences instructional and office space, constructing a new health sciences surge building, and enhancing a vivarium. These facilities will revert to the main campus once the West Campus phase is complete. Total capital costs for the East Campus transition phase are approximately $48 million, uninflated and in 2006-07 dollars.

The West Campus phase establishes the infrastructure and constructs new medical instruction and research facilities to be completed by 2015 on a 40-acre, dedicated site. This phase includes required infrastructure development and new construction. Initial facilities include a medical instruction and research building and a vivarium. The West Campus phase is projected to cost approximately $508 million. Timelines and costs are illustrated in Figure ii.

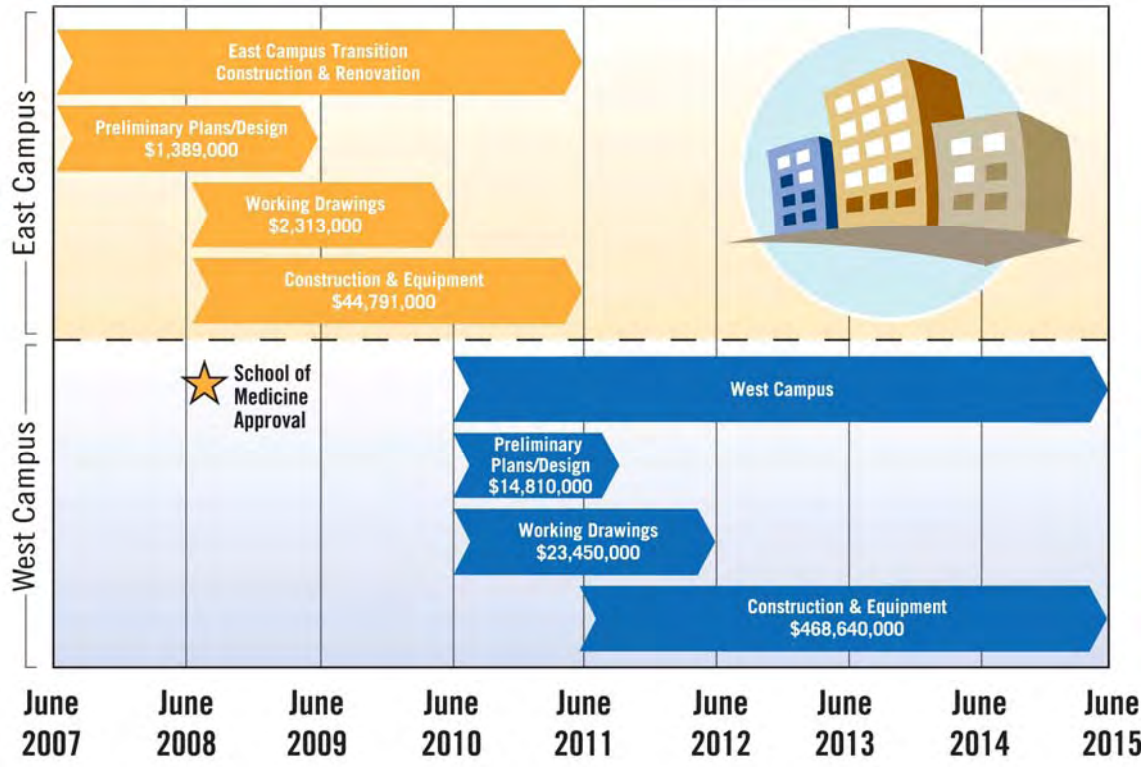
The University will look to the state for assistance in financing a significant portion of the capital program. Details on the capital program and infrastructure needs may be found in Part IV, Chapter II.

Development and Fundraising

Fundraising comprises a significant component of the financial model for the UCR School of Medicine. Funds generated through development efforts will supplement but not supplant the operating and capital support from the state of California. Even without final approval for the medical school, UCR already has raised approximately $30 million in gifts/pledges and endowments. Once approval is obtained, UCR will mount a 10-year capital campaign with a

target of $250 million. Based on benchmarks from comparable medical schools, UCR can expect to target ongoing support averaging $25 million annually. In the financial models for the school, projected fundraising amounts are shown as a reduction in total investments required. Development and fundraising are described in Part IV, Chapter III.

Figure ii. Capital Planning and Construction Timeline



* The first of the Medical Instruction and Research Buildings will be completed by 2014 to support the first incoming class of 100 students.

★ Milestone

State Investment

Even with this ambitious fundraising effort, the UCR School of Medicine will require additional investment by the state of California of $100 million for operations, above and beyond the enrollment driven state revenue projections. This investment will cover the $23 million shortfall in the start-up phase and the $50 million shortfall in the growth phase. In addition, the $100 million state investment will provide contingency and discretionary funds necessary to hire the founding dean and initial faculty. Just as the start of a new campus, the start of an enterprise the size and scope of a new medical school requires significant upfront resources for establishment and development of infrastructure and the hiring of faculty and staff. Once it reaches maturity, projected for 2020-21, the UCR medical school will become self-sustaining.

UCR requests the state investment in the form of $15 million per year for four years, beginning 2009-10, and the remainder at $10 million per year from 2013-14 through 2016-17. The state also will be asked to provide financing for a significant portion of the $500 million capital

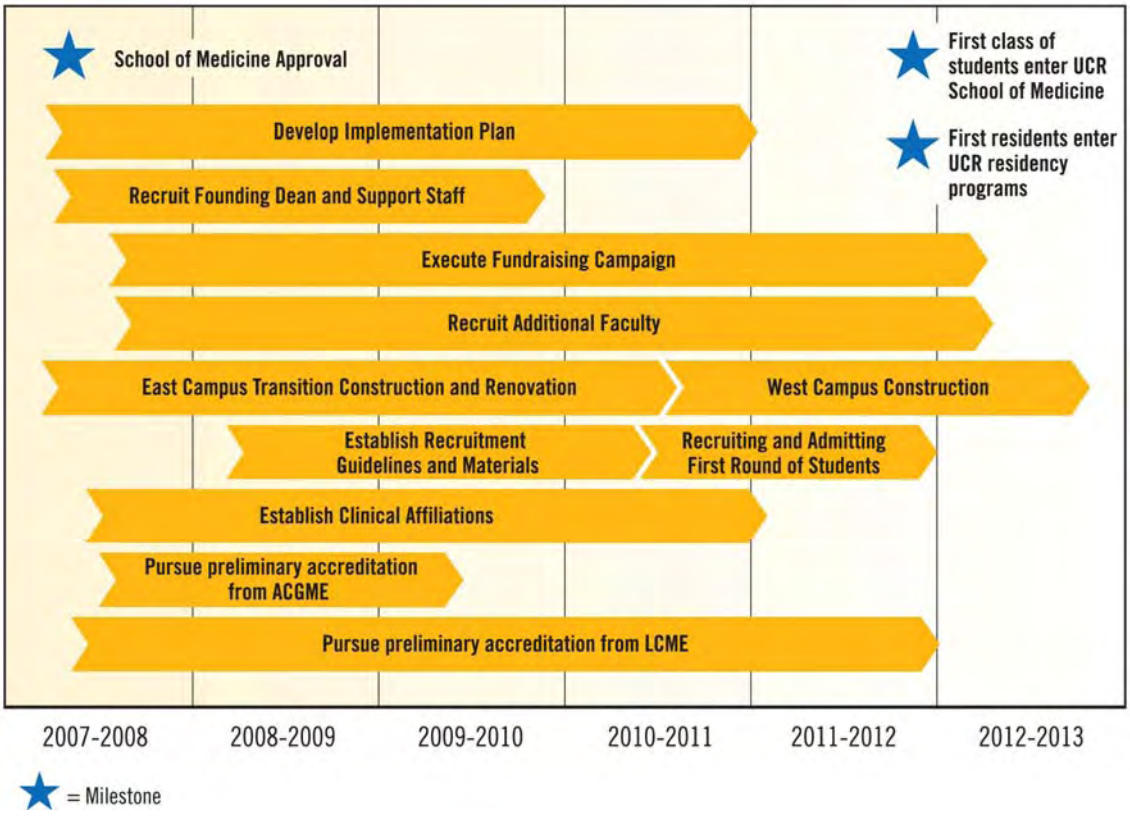
program for the medical school. These investments will help the UCR School of Medicine to fulfill its mission and thereby provide a much-needed service to the state of California.

Key Milestones

Figure iii illustrates a number of the critical milestones that must be met for the UCR School of Medicine to join the UC family of medical schools. Successful establishment of the school requires hiring the founding dean, recruiting diverse faculty and students; delivering the curriculum and postgraduate training programs; expanding basic science research, while building robust clinical and health services research programs; and developing the clinical enterprise. The medical school must obtain appropriate accreditations by the Liaison Committee on Medical Education and the Accreditation Council for Graduate Medical Education. (See Appendix A for descriptions of the accrediting and governing bodies for U.S. medical schools.) Infrastructure needs include development of the medical school administration and support services as well as near- and long-term capital facilities. In addition, UCR must leverage state, community, alumni, and economic relationships to accelerate fundraising and generate the initial resources necessary for launch of the school. In particular, UCR requires Regental approval for establishment of the School of Medicine so that the University of California may seek the upfront state investment that will be required.

With this state investment, the UCR School of Medicine will be well positioned to help meet the growing state and regional need for a highly trained and diverse physician workforce.

Figure iii. School of Medicine Key Milestones



PART I. HISTORY AND BACKGROUND

UCR/UCLA Thomas Haider Program in Biomedical Sciences

UCR's history in medical education dates to 1974, when the UCR/UCLA Program in Biomedical Sciences was established. In 1997 the program was named for Dr. Thomas T. Haider, a Riverside spine surgeon and longtime supporter of the program. Nearly 700 students have received their M.D. degrees during the program's 34-year history.

In 2003, in partnership with community leaders in medicine, business, education, and philanthropy, the program's mission was reshaped to emphasize preparing students for distinguished medical careers serving the healthcare needs of the underserved, inland, and rural populations. At the same time, elements of the program were restructured to broaden student access and success. Twenty-four UCR students are chosen each year to enter the UCR/UCLA Program. They complete the first two years of the medical school curriculum at UCR, where they are taught fundamental scientific principals by UCR professors and clinical skills by a team of approximately 80 clinical faculty who are community physicians and practitioners. Students then transfer to the David Geffen School of Medicine at UCLA to finish their M.D. degrees.

Efforts to Establish a Four-Year Medical School

Former UCR Chancellor France A. Córdova initiated planning for a four-year medical school in 2003, when she appointed a blue ribbon panel of renowned academics and education leaders to advise the campus in expanding medical education and health sciences research. The following year, a group of deans known as the Peck Panel – named for its chair, William Peck, former dean, Washington University School of Medicine – reviewed initial plans for a medical school and provided recommendations to guide further planning. An External Advisory Board was appointed in 2006 to help craft a distinctive academic vision for the medical school and to guide UCR throughout the planning process. The board is chaired by Haile Debas, former chancellor and dean emeritus (medicine) of UC San Francisco; other members are shown in Figure 1.

UCR's planning was driven, in part, by the work of the University wide Health Science Committee. Its assessment of California's healthcare workforce needs substantiated the need to increase enrollment at existing UC medical schools and to initiate planning for one or more new medical education programs in the University.

Development of a preliminary proposal to establish a medical school at UCR was guided both by forecasted workforce requirements and by the insights of these distinguished outside experts and UCR faculty, who developed a vision for expanding health sciences research. Among them was Robert D. Grey, now acting chancellor of UCR, who was appointed executive assistant to the chancellor for health affairs in 2005 to help expand the UCR/UCLA Program into a four-year medical school. The campus submitted a preliminary proposal to Office of the President in May 2006. In November of that year, the preliminary proposal received the endorsement of the UC Board of Regents. As acting chancellor, one of the five goals Dr. Grey has articulated for the campus during his tenure is securing Regental approval for the medical school.

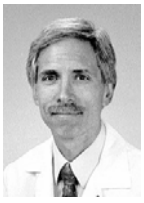
Figure 1. UCR School of Medicine External Advisory Board

Haile Debas, M.D. (Chair)
Executive Director, UCSF Global Health Sciences; Former Dean and former Chancellor, UCSF

Jordan J. Cohen, M.D.
Professor of Medicine and Public Health, George Washington University; Former President, Association of American Medical Colleges; former Dean, SUNY Stony Brook School of Medicine

David Hayes-Bautista, Ph.D.
Professor of Medicine and Director, Center for the Study of Latino Health and Culture, David Geffen School of Medicine, UCLA

Joseph Martin, M.D., Ph.D.
Former Dean of Faculty of Medicine, Harvard Medical School; former Dean and Chancellor, UCSF



Neil Parker, M.D.
Associate Professor of Medicine and Senior Associate Dean, David Geffen School of Medicine, UCLA

Deborah Powell, M.D.
Dean of the Medical School and Assistant Vice President for Clinical Sciences, University of Minnesota

Ralph Snyderman, M.D.
Chancellor Emeritus for Health Affairs, Duke University; President and CEO, Duke University Health System

Methodology

The Regents' action authorized UCR to proceed with final planning for the school. Subsequently, the campus appointed a vice provost for health affairs and an executive director of medical school planning. A proposed curriculum for the medical school was drafted by the curriculum planning committee of faculty and clinical instructors, in consultation with leading administrators in the David Geffen School of Medicine at UCLA.

In fall 2007, the campus launched a business planning effort, facilitated by Deloitte Consulting, involving more than 80 faculty, staff, medical and community leaders, campus administrators, and alumni on six work groups and a business modeling team. (See Appendix B for membership.) The six work groups were charged with developing specific components of the medical school: the administrative structure; facilities and capital planning; the research enterprise; academics; graduate medical education programs and the associated relationships with local medical facilities; and the clinical faculty requirements for teaching third and fourth year medical students. A Business Modeling and Design Team tested the planning assumptions developed by the work groups and developed the detailed financial pro forma. The entire process was overseen by the School of Medicine Executive Council, chaired by Acting Chancellor Grey.

Also appointed was a Chancellor's Community Advisory Board to provide a non-institutional perspective in the planning and implementation of a new medical school (Appendix B). This group, which continues in its advisory capacity, is made up of area physicians, hospital administrators, and other medical and health experts, as well as community and business leaders.

The methodology used throughout the business planning phase of proposal development included an in-depth analysis of the academic medical environment, an assessment of national and state trends, studies by the Association of American Medical Colleges (AAMC), and an overview of UC system-wide policies and procedures. In addition, recent studies by various accreditation bodies, the University of California, and others were used to assess the overall need for the UCR School of Medicine. In developing individual components of the medical school, UCR used as benchmarks the experience of other UC medical schools, as well as medical schools across the nation that employ a distributed clinical model.

The result of the comprehensive, inclusive planning effort is this formal proposal to establish a medical school at UC Riverside.

PART II. THE NEED

With serious physician shortfalls projected at the national, state, and regional levels, the need for new medical schools is well documented. Based on these needs, the University of California Office of Health Affairs issued a report in April 2005 calling for expanding enrollments at existing UC medical schools and planning for at least one new comprehensive educational program in medicine.[9] The UC Advisory Council on Future Growth in the Health Professions further recommended to the UC Board of Regents in 2006 that there be a 34 percent increase in UC medical student enrollment by 2020, with a comparable increase in medical resident enrollment.[10] In its final report, issued in January 2007, the Council recommended that this growth be accomplished by increasing enrollments at existing schools and by planning for at least one new UC school of medicine that would graduate its first class by no later than 2020.[11]

CHAPTER I. NATIONAL NEED

This need is experienced nationwide. Various studies suggest national shortfalls of at least 100,000 physicians over the coming decade. A January 2006 report of the Association of American Medical Colleges (AAMC) calls for a 30 percent expansion of enrollment in medical schools by 2015, through expansion of existing schools and development of new schools of medicine.[12] Such an expansion would lead to an additional 5,000 new medical students annually. This projected need is based on population growth, the aging of the population, and the concomitant aging of the physician workforce.

[9] *University of California Health Sciences Education: Workforce Needs and Enrollment Planning*, April 2005, http://www.ucop.edu/healthaffairs/reports/UC%20binder_final_9.1.pdf
[10] http://www.university ofcalifornia.edu/regents/minutes/2006/edpol1106.pdf
[11] *A Compelling Case for Growth, Special Report of the Advisory Council on Future Growth in the Health Professions*, January 2007, http://www.ucop.edu/healthaffairs/FINAL%20Report%20January%202007.pdf
[12] *Key Physician Data by State*, Association of American Medical Colleges Center for Workforce Studies Report, November 2007

CHAPTER II. STATEWIDE NEED

California is one of the states hardest hit. The Center for Health Workforce Studies estimates that by 2015, physician demand will outpace physician supply in the state by 4.7 to 15.9 percent.[13] As shown in Figure 2, two-thirds of California counties already have fewer than 80 generalist physicians per 100,000 population, the ratio considered by the Council on Graduate Medical Education (COGME) as optimal to meet public demand.[14]

The shortfall of specialists is expected to be particularly serious, exacerbated by: (1) growth in numbers of elderly Californians with chronic conditions, (2) advances in clinical research and biomedical technology, which expand the portfolio of specialty care, and (3) greater demand among consumers for specialized health care.[15]

Figure 2. Generalist Physicians per 100,000 Population, by County

NOTE: Council on Graduate Medical Education considers 80 per 100,000 to be optimal for generalist physicians; data source is AMA licensed datafile, May 2007.

[13] *California Physician Workforce: Supply and Demand through 2015*; Center for Health Workforce Studies, University at Albany, State University of New York, December 2004, pp ES-10, 61-68

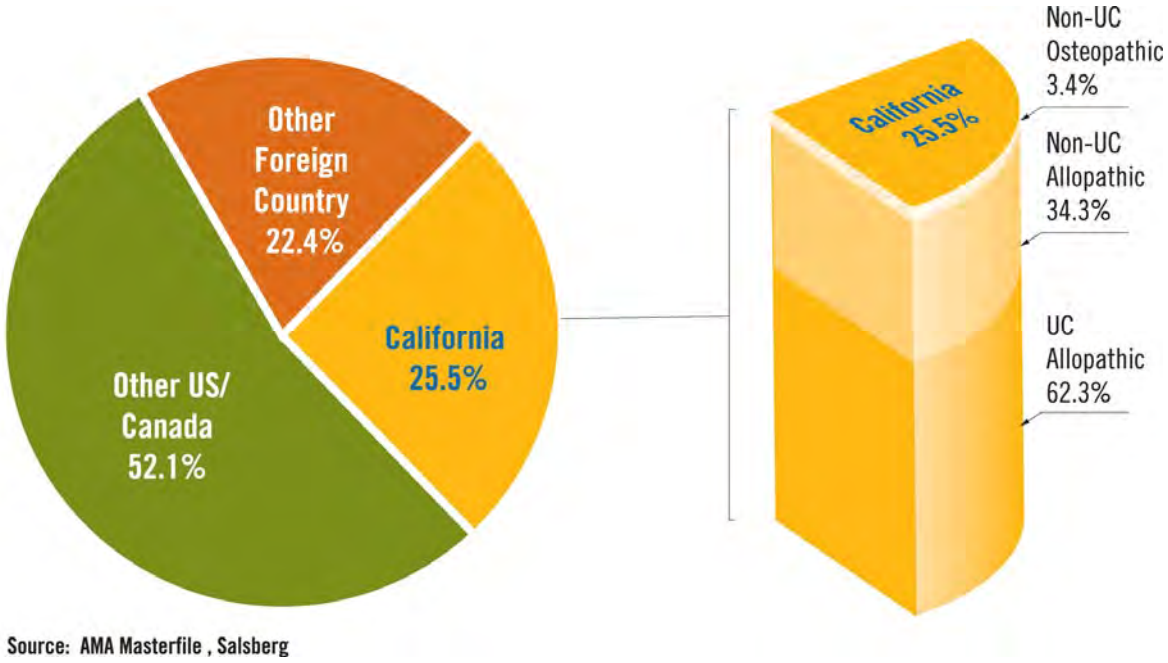
[14] *Is there a Doctor in the House: An Examination of the Physician Workforce in California Over the Past 25 Years*, University of California, Berkeley, June 2004, p. 12

[15] *Is there a Doctor in the House: Ibid*, p. 29

California Physicians Trained Out-of-State

These shortages are further complicated because California is dependent on other states and countries for medical school training. As shown in Figure 3, approximately 75 percent of California physicians received their medical training in other states or countries. Further, the Accrediting Council for Graduate Medical Education (ACGME) ranks California in the bottom half nationwide for physicians serving residencies and fellowships, the proportion of active physicians who attended medical school in the state, and the proportion of new allopathic students who matriculated in state schools in 2004.[16] This is particularly important because physicians—both generalists and specialists—tend to practice near the area in which they completed their residencies.[17] Retention is even greater, particularly in California, when a physician attends medical school and completes his or her residency in the state.[18]

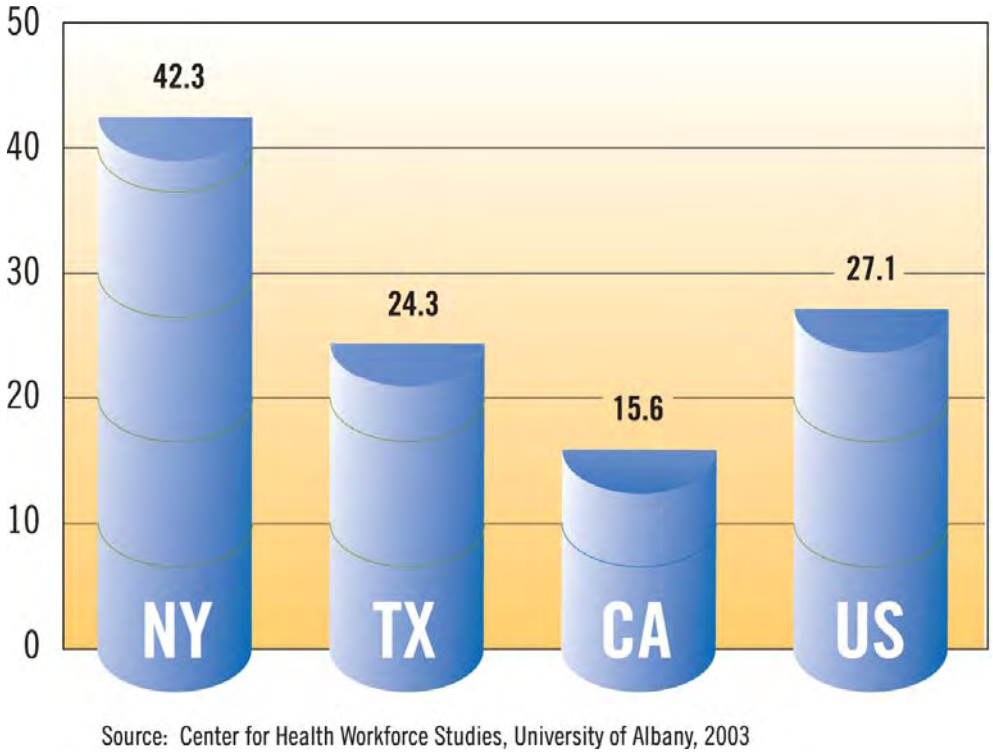
Figure 3. Location of Medical School Education of Active Patient Care Physicians in California, 2002



As Figure 4 indicates, California significantly lags the U.S. as a whole for medical school enrollment per 100,000 state citizens; according to the AAMC, the state ranks 39th in the nation. This, combined with a rapidly growing population and aging physician workforce, points to a serious physician shortfall over the next decade.

[16] *Key Physician Data by State*, Association of American Medical Colleges Center for Workforce Studies Report, January 2006
[17] *American Medical Association* licensed datafile of May 2007. Chicago, IL: American Medical Association
[18] Rosenthal, T.C., McGuigan, M. Anderson G. 2000. "Rural residency tracks in family practice: Graduate outcomes" Family Medicine 32: 174-7

Figure 4. Medical School Enrollment per 100,000 Population



Source: Center for Health Workforce Studies, University of Albany, 2003

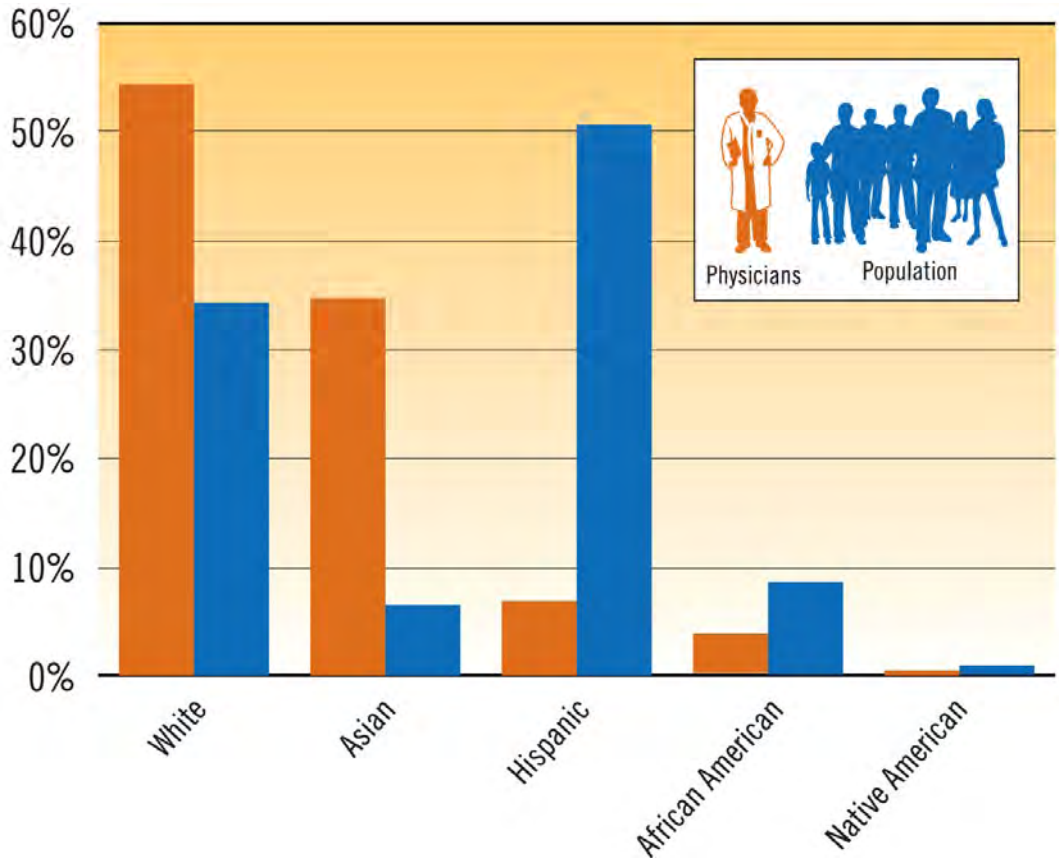
Ethnic Dimensions of Physician Demand

The lack of medical school seats and residencies is just one dimension of California's physician shortfall. The state's physicians do not reflect the ethnicity of the state's population. From 1978 to 2002, California's Hispanic population rose from 18 to 32 percent and Asian/Pacific Islander rose from 5 to 12 percent, while African American and Native American remained at 7 percent and 1 percent respectively.[19] By contrast, the majority (66 percent) of physicians in the state are non-Hispanic white, with 22 percent Asian/Pacific Islander, 4 percent Hispanic, and 3 percent African American.[20]

Sub-county areas with high percentages of African-Americans and Hispanics are more likely to have shortages of physicians.[21] The following figure compares the ethnicity of physicians in Inland Southern California to the region's population.

[19] *Is There a Doctor in the House: An Examination of the Physician Workforce in California Over the Past 25 Years*; University of California, Berkeley, June 2004, p. 29
[20] *California Physician Workforce: Supply and Demand through 2015*; Center for Health Workforce Studies, University at Albany, State University of New York, December 2004
[21] *Is There a Doctor in the House, Id.*, p. 45

Figure 5. Ethnicity of Physicians in Inland Southern California Compared to Population



CHAPTER III. REGIONAL NEED

Just as disparities in physician ethnicity relative to population vary from region to region, so too do physician supply and demand. The state's overall distribution has not changed significantly since the late 1970s: affluent, metropolitan counties have the highest ratios of physicians to population, while poor, rural areas have the lowest.[22] With 11 percent of the state's population (4,171,000 in 2007) and 20 percent of the state's geography, Inland Southern California (Riverside, San Bernardino, and Imperial counties) faces one of the most serious physician shortfalls in the state.

Impending Health Care Crisis in Inland Southern California

A report of the Center for Health Workforce Studies compared 10 geographical areas of California and concluded that Riverside and San Bernardino counties share with Merced and nearby counties the lowest ratio of active patient care physicians (including both generalists and specialists) in the state.[23] Due to its far greater population density, this represents a greater shortfall in actual numbers of physicians in the Inland Southern California region. UCR conducted a similar analysis using May 2007 data from the American Medical Association Physician Masterfile, and determined that Inland Southern California had 49 generalist physicians (far below the 80 optimum) and 74 specialist physicians per 100,000 people.[24]

Two recent studies have modeled physician supply and demand in Inland Southern California. Although the authors used different data, methods, and assumptions, they reached similar conclusions. Salsberg (2003) projected that from 2002 to 2015, physician demand in Riverside and San Bernardino counties will grow by 40 percent.[25] If physician supply is not responsive to changes in regional demand, these counties will experience a physician shortfall of 53 percent, or 1,141 physicians.[26]

More recently, RAND produced a report on physician supply and demand in Inland Southern California which noted that, if the status quo is maintained through 2020, physician supply will fall short of demand by 32 percent.[27] RAND attributed the shortfall primarily to the incredible regional population growth anticipated by the California Department of Finance.

Projected Population Growth in the Region

If the "Inland Empire" region of Riverside and San Bernardino counties were a state, its projected population growth would rank fourth in the nation, behind California as a whole,

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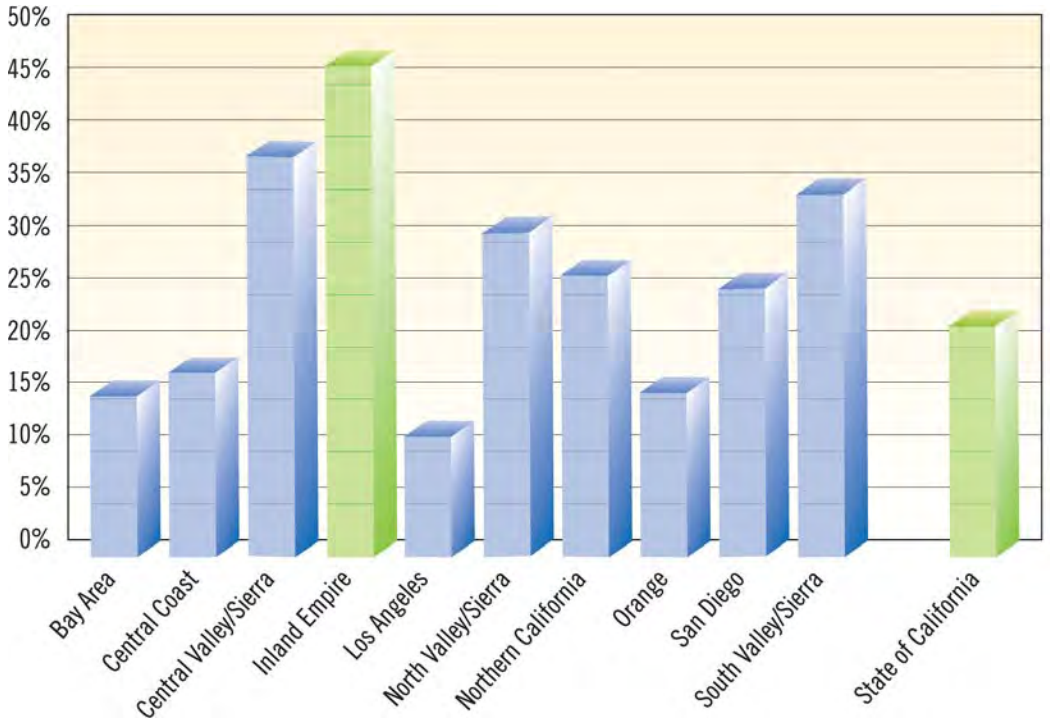
[22] *Is there a Doctor in the House Id.*, p.33
[23] *California Physician Workforce, Id.*
[24] Mason, B., & Gill, R. (2006). *Preliminary Proposal to Establish a School of Medicine at the University of California Riverside*. Unpublished proposal, University of California Riverside
[25] *A Report to: The Office of Health Affairs, University of California;* Presentation, Edward Salsberg, Center for Health Workforce Studies, University at Albany, State University of New York, December 2003
[26] *Ibid*.
[27] http://www.rand.org/pubs/technical_reports/2007/RAND_TR524.pdf

Texas, and Florida.[28] These two counties added more than 666,000 people between 1990 and 2000, an increase comparable to the entire population of Kern County. Between 2000 and 2015, this two-county region is expected to experience the highest population growth in the state, at 47.3 percent, or more than 1.5 million people.[29] Figure 6 shows the projected population growth in the state by region.

Figure 6. Percentage Population Growth by California Region, 2000 - 2015

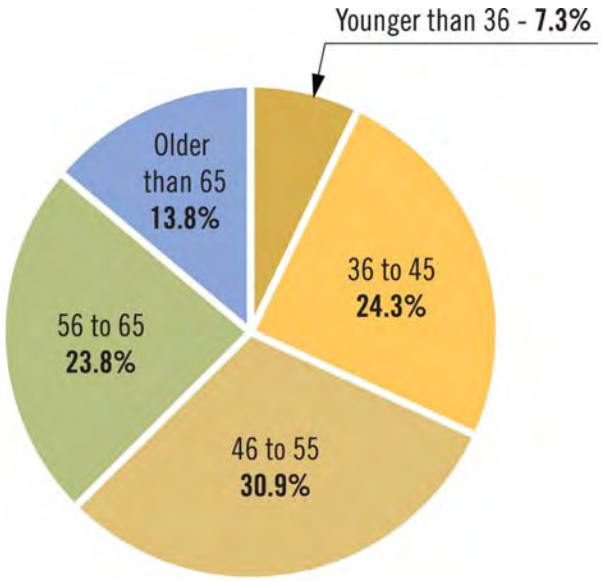


Inland Southern California's Aging Physician Workforce

At the same time that the Inland Southern California population is expanding, many of the region's practicing physicians are expected to retire in the next decade, further exacerbating the shortfall.[30] Statewide, the number of active patient care physicians aged 66 or older has tripled since the late 1970s, and the number aged 56 to 65 has doubled. In Inland Southern California, 39 percent of physicians were of retirement age (55 or older) as of May 2007.[31] As these physicians retire, the ratio of physicians to population will be further diminished. Figure 7 illustrates the physician age distribution in Inland Southern California.

[28] *The High Growth Area of the Rapidly Growing Inland Empire*; Rating Agency Presentation, John Husing, Economics & Politics, Inc., April 2005.
[29] California Department of Finance, Population Projections.
[30] *California Physician Workforce, Id*, p ES-3; See also *American Medical Association* licensed datafile, *Ibid*.
[31] *American Medical Association* licensed datafile of May 2007. Chicago, IL, American Medical Association.

Figure 7. Age Distribution of Physicians in Inland Southern California



Existing California Medical Schools

California has eight allopathic (M.D. granting) schools of medicine accredited by the Liaison Committee on Medical Education (LCME) and two osteopathic (Doctor of Osteopathy, or D.O. granting) medical schools accredited by the American Osteopathic Association Commission on Osteopathic College Accreditation. As shown in Table 1, total enrollment in California's allopathic medical schools was 4,477 and enrollment for osteopathic schools was 1,257 in 2006.

Table 1. Enrollment in California's Allopathic and Osteopathic Medical Schools

School	Enrollment
Western University of Health Sciences*	724
Loma Linda University	716
UCLA	686
University of Southern California	676
UC San Francisco	634
Touro University*	533
UC San Diego	507
Stanford University	461
UC Irvine	410
UC Davis	387
Total	**5734**

*Osteopathic medical schools

Sources: AAMC Student Enrollment Data (2007); Annual Statistical Report on Osteopathic Medical Education (2006)

California medical schools have excellent reputations: In published rankings for 2008, *U.S. News and World Report* placed all five UC medical schools among the top 50 nationally in both research and primary care, and ranked Stanford and the University of Southern California in the top 50 in research. Nevertheless, available seats in California medical schools are not sufficient to meet current demand. As the population grows, the situation will only be exacerbated.

Loma Linda University School of Medicine in San Bernardino County is the only current California allopathic medical school located in a county with fewer than 60 generalist physicians per 100,000 population. Inland Southern California has 11 percent of the state population, but has only 6.7 percent of the allopathic postgraduate programs in the state (48 of 716).[32] This, too, points to the need for an additional school of medicine in the rapidly growing and medically underserved Inland Southern California region.

[32] As listed 6-1-07 at http://www.acgme.org.

CHAPTER IV. RESPONDING TO THE NEED

The UCR School of Medicine will meet health care needs by serving as a locus for expanded medical care; by educating physicians who are likely to enter residencies, and later practice, in the state or region; and by training a culturally competent and diverse physician workforce.

Serving the Underserved

Providing health care to the medically underserved is embedded in the mission of the UCR medical school. The school will attempt to fulfill this mission in a number of ways:

- UCR's distributed clinical model of training will help meet the needs of the medically underserved in Inland Southern California by placing students in clerkships in clinics and hospitals throughout the region. Students will be exposed to faculty members and clinicians who are passionate about the medical needs of underserved populations, and to the varied needs of the patients themselves. Already a number of hospitals and clinics have expressed their eagerness to partner with UCR.

- Residency programs are the strongest determinant of the location in which physicians practice. UCR's medical school will establish a broad spectrum of postgraduate programs—in terms of both discipline and geography—in collaboration with regional hospitals and clinics that are of superior quality and capable of attracting graduates from UCR's medical school as well as other schools in California and across the nation. Over time many of these residents will become practicing physicians in the region.

- The School of Medicine will develop innovative and distinguished research programs that focus on the etiology, prevention, and treatment of diseases, particularly those that disproportionately affect the ethnic and cultural groups residing in this region.

- A major challenge to the academic medical community is redesign of the healthcare system by implementing new scientific knowledge, with the goal of developing a more systematic and coordinated approach to healthcare delivery. Through its research, education, and service programs, the UCR School of Medicine will work to meet this challenge.

UCR is located in a region that is home to many diverse groups and special populations. More than twenty Native American tribal groups and reservations are located within 50 miles of the campus, and the Sherman Indian School is located in Riverside. Large Hispanic, African-American, and specific Asian-American (e.g., Vietnamese and Laotian) communities exist in western Riverside and San Bernardino counties as well as poor urban and rural areas. While each of these populations and communities is medically underserved, each faces unique challenges and has specific medical needs.

Training a Diverse Physician Workforce

Training a diverse physician workforce is also embedded in the mission of the UCR School of Medicine. UCR is in a strong position to lead this effort. *U.S. News and World Report* ranks the campus third in the nation among public research universities for the diversity of its undergraduate population. UCR also has the second most diverse total student body in the UC system. Further, for the past two years, the UCR/UCLA Program has attracted 25 percent underrepresented minorities—an excellent foundation upon which to build.

UCR will continue to make diversity in medical enrollments a priority, by committing resources and programs to ensure this mission is achieved. A major challenge for the campus will be stimulating its already diverse undergraduate population to aspire to medical school and assisting these students to establish academic and service records that make them competitive for medical school admission. As described in Part III, Chapter III, the UCR medical school will utilize and expand its existing and highly successful support programs, FastStart and the Medical Scholars Program, to help students succeed. In addition, UCR will to reach out to regional high schools through a special program aimed at drawing economically and educationally disadvantaged students to the health sciences.

In training diverse students to become physicians, it is important to enhance their educational experience by exposing them to diverse experiences, people, and ideas. The medical school will offer curricular programs and courses as well as experiential learning opportunities for undergraduates aimed at developing cultural sensitivity and language capabilities that respond to the underserved population. Recognizing the changes in the career choices of graduates, the medical school will utilize a curriculum that affords students the opportunity to focus on improved health care in both primary care and specialty areas, as well as careers in health sciences research. Additional details on UCR's commitment to training a diverse physician workforce may be found in Part III, Chapter III.

Economic Impact to Region

UCR's economic impact on the state of California is more than $900 million, with nearly 70 percent of that impact in the Inland Empire (Riverside and San Bernardino counties). The addition of a medical school will stimulate significant additional benefits through the creation of new jobs, direct spending by the medical school for goods and services, and generation of additional tax revenue. While the magnitude of a UCR medical school's economic impact cannot yet be forecast, national data suggest that Inland Southern California would experience a measurable boost in economic development by the presence of a medical school. According to a recent AAMC report, every dollar spent by a medical school or teaching hospital indirectly generates an additional $1.30 when it is "re-spent" on other businesses or individuals, resulting in a total impact of $2.30 per dollar.[33]

[33] Tripp Umbach (2006), *The Economic Impact of AAMC Member Medical Schools and Teaching Hospitals, 2005* (Washington, DC: Association of American Medical College, 2007)

Further, the UCR School of Medicine is widely viewed by the regional business community as an opportunity for diversifying the economy. The region's economy is largely dependent upon goods movement, construction, service industries and, more recently, retail sales. The nascent technology industry still lacks a critical mass of home-grown innovation to stimulate new business creation and outside industry interest. The research enterprise of the medical school – building on an already strong foundation of fundamental health sciences-related research – will bring new opportunities for translational biomedical investigations and clinical trials to complete the innovation pipeline from discovery to new business development.

PART III. THE SCHOOL

The UCR School of Medicine will achieve its mission through the education of new physicians and the creation of new knowledge by researchers. These fundamental objectives are central to addressing critical healthcare needs of the region, state, and nation. This part of the medical school proposal discusses the people who comprise the school – medical students, faculty, Ph.D. students, and interns and residents – as well as the programs that support their activities. In outlining the major programmatic elements of the medical school, key operational considerations and financial assumptions will be highlighted with respect to the school's commitment to diversity and affirmative action, delivery of the four-year curriculum, postgraduate training programs, the research enterprise, and the clinical functions.

At maturity, the UCR School of Medicine will enroll a total of 400 medical students, 160 graduate students, and 160 postgraduate students (residents and interns). The delivery of medical education programs supporting these students and the research and clinical enterprises will be carried out by 138 full-time equivalent (FTE) faculty, with actual faculty headcount being significantly higher than the FTE. The planned enrollment targets provide the basis to launch the medical school into a significant venture.

CHAPTER I. STUDENT ENROLLMENT

The first class of medical students will matriculate in academic year 2012 with a class size of 50, ramping up to 100 students per class by 2017-18, for a total medical student body of 400 students. To support the research enterprise and to help meet state and national needs for technically trained scientists and engineers, the medical school will incrementally increase graduate student (Ph.D.) enrollment to 160 by 2021-22. Core postgraduate medical education programs (internships and residencies) will grow to 160 by 2017-18. UCR's infrastructure, support services, faculty, and staff will gradually increase in conjunction with enrollment projections. Enrollment projections are illustrated in Figure 8.

Medical Student Enrollment

Medical student enrollment will build upon the existing UCR/UCLA Program, which currently enrolls 48 students in the first two years of medical school. This number will rise to 52 in 2008-09 and 56 in 2009-10 with the addition of eight enrollees in UC's PRogram In Medical Education (PRIME). PRIME is a university-wide program that supports medical students who have demonstrated a commitment to practicing in underserved areas. Upon opening in 2012-13, the school will have 50 new first-year enrollees and 28 second-year students from the UCR/UCLA Program, for a total medical student enrollment of 78. Medical student enrollment will expand rapidly, to 100 students per class by 2017-18.

From a recruitment standpoint, these ambitious projections are attainable given the large, unmet demand for medical education in California (see Part II, Chapter II) and the current success of the UCR/UCLA Program in attracting prospective medical students to UCR. (See Part III, Chapter III). Additional expansion of medical student enrollment may be considered during the

latter portion of the growth phase to broaden UCR's impact on the medical education needs of the region and the state; however, further growth would require an assessment of additional infrastructure and resource needs.

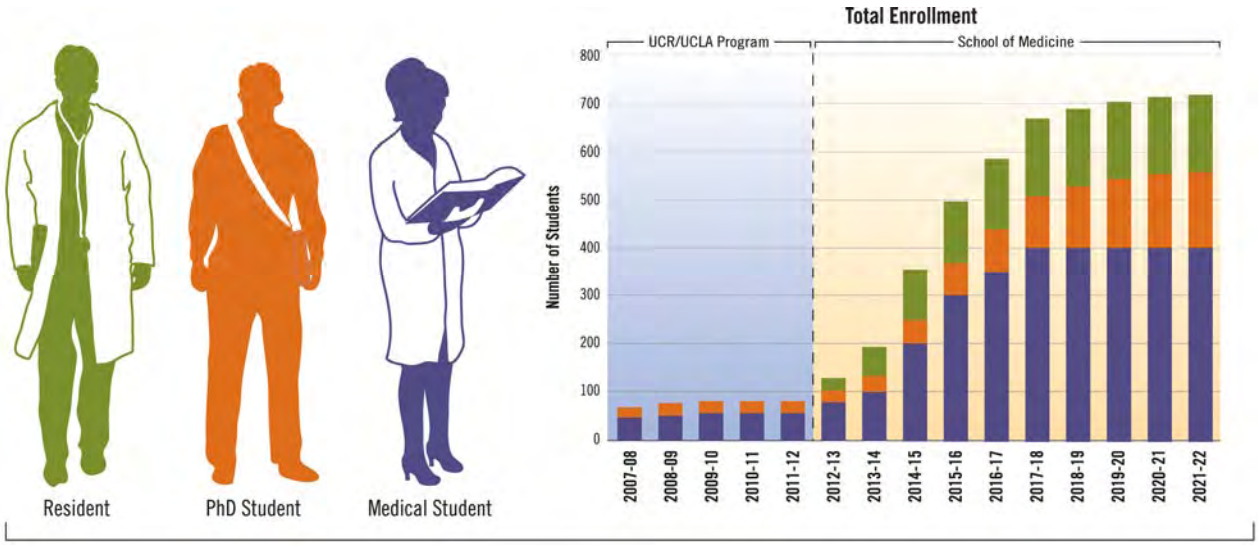
Ph.D. Student Enrollment

The medical school will build on the recently revised graduate program in biomedical sciences. Expansion of academic graduate student enrollment will commence upon approval of the medical school, growing from its current level of approximately 20 to 25 students when the medical school opens and reaching 160 in 2021-22. Graduate students will receive their Ph.D.s in the strategic medical research areas identified in the planning process. (See Part III, Chapter VI). Ph.D. student growth in the medical school also contributes to UCR's aggressive goal to expand campus wide graduate student enrollment four-fold by 2021.

Intern and Resident Enrollment

Graduate medical education programs will be launched in summer 2012 with 26 postgraduate medical students, growing to 160 by 2017-18. These programs will offer the required training to achieve board certification and medical licensure and will provide additional health care services in the region. The operating structure necessary for development, accreditation, and implementation of the programs will start in 2008-09, with a program director specific to each clinical program assigned two years prior to the admission of the first residents. Ultimately, UCR plans to expand postgraduate training into other more specialized training programs and to double or triple the size of this program.

Figure 8. Student Enrollment Projections



CHAPTER II. FACULTY

Faculty ranks in the medical school will be built upon the existing 14 faculty FTE in the UCR/UCLA Program. These faculty already provide the first two years of medical school instruction and direct active research programs in the biomedical sciences. Upon build-out, 138 faculty FTE will be required to deliver the four-year curriculum, expand the biomedical research base, support the clinical education enterprise, and establish and manage the postgraduate programs. This total is based on long-established and state-supported student-faculty ratios of 3.5:1 for M.D. students, 18.7:1 for Ph.D. students, 10:1 for interns and residents.

The distribution of faculty ranks at maturity is expected to mirror that of the overall UC medical school averages of 50 percent full professor, 20 percent associate professor, and 30 percent assistant professor. It is important to note that the headcount faculty will be much higher than the calculated 138 faculty FTE since the faculty ranks will include a number of clinical faculty and community physicians with part-time positions or responsibilities in the School of Medicine. Table 2 outlines the faculty growth trajectory in relation to enrollment.

Faculty Recruitment

Faculty resources and support services will be needed to meet the unique instructional and clinical training requirements of the medical school. The strategy for building the faculty ranks includes the early recruitment of four senior research leader faculty; these professor-level faculty will be expected to rapidly advance the medical school's research vision. By 2020-21 an additional 50 basic science/clinical research scientist faculty are projected to support the basic science and clinical teaching aspects of the four-year medical school. The existing faculty, senior research leader faculty, and basic science/clinical research faculty together will total 68 faculty FTE focused on both education and health sciences research initiatives. In addition to these FTE, it is anticipated there will be 70 FTE in clinical education faculty and community faculty who support the clinical education requirements for medical students and postgraduate students. Detailed definitions of these faculty types can be found in Appendix C.

Faculty recruitment and support will be required prior to student enrollment to:

- Obtain preliminary accreditation from the Liaison Committee on Medical Education (LCME);
- Define community-based provider affiliations and faculty development for clerkships;
- Obtain accreditation for Graduate Medical Education (GME) programs and prepare for participation in GME teaching programs; and
- Develop a critical mass in research faculty to support medical and graduate school programs.

Table 2. UCR School of Medicine Student Enrollment and Faculty Projections

	'07-'08	'08-'09	'09-'10	'10-'11	'11-'12	'12-'13	'13-'14	'14-'15	'15-'16	'16-'17	'17-'18	'18-'19	'19-'20	'20-'21	'21-'22
Enrollment															
Medical Students															
1st Year	24	28	28	28	28	50	50	100	100	100	100	100	100	100	100
2nd Year	24	24	28	28	28	28	50	50	100	100	100	100	100	100	100
3rd Year								50	50	100	100	100	100	100	100
4th Year									50	50	100	100	100	100	100
Total Medical Students	**48**	**52**	**56**	**56**	**56**	**78**	**100**	**200**	**300**	**350**	**400**	**400**	**400**	**400**	**400**
Graduate Academic (PhD)	**20**	**25**	**25**	**25**	**25**	**25**	**33**	**49**	**70**	**90**	**110**	**130**	**145**	**155**	**160**
Intern and Residents						**26**	**60**	**107**	**128**	**147**	**160**	**160**	**160**	**160**	**160**
Faculty FTE Funding Calculations															
Metrics															
Medical Student Metric	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
PhD Student Metric (funding in '12-'13)						18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7
Intern and Resident Metric (funding in '12-'13)						10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
State Funded Faculty FTEs (other than residents) [1]	14.0	15.0	16.0	16.0	16.0	23.0	30.0	59.0	89.0	104.0	120.0	121.0	122.0	122.0	122.0
State Funded Faculty FTEs (residents)	-	-	-	-	-	3.0	6.0	11.0	13.0	15.0	16.0	16.0	16.0	16.0	16.0
Total SOM State Funded Faculty FTEs	**14.0**	**15.0**	**16.0**	**16.0**	**16.0**	**26.0**	**36.0**	**70.0**	**102.0**	**119.0**	**136.0**	**137.0**	**138.0**	**138.0**	**138.0**
Faculty FTE Resources (refer to descriptions)															
Existing Faculty	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Research Leader Faculty				-	1.0	1.0	2.0	2.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0
Other Basic Science/Clinical Research Faculty	-	-	2.0	2.0	6.0	8.0	12.0	14.0	31.0	34.0	46.0	48.0	49.0	50.0	50.0
Clinical Education Faculty			1.0	3.0	6.0	13.0	18.0	32.0	35.0	40.0	43.0	43.0	43.0	43.0	43.0
Community Clinical Physicians (1st/2nd Year) [2]						4.0	5.0	5.5	6.3	5.5	4.7	4.0	3.2	2.4	2.0
Community Clinical Physicians (Clerkships)								10.5	12.7	22.5	24.3	24.0	24.8	24.6	25.0
Total FTEs	**14.0**	**14.0**	**17.0**	**19.0**	**27.0**	**40.0**	**51.0**	**78.0**	**102.0**	**119.0**	**136.0**	**137.0**	**138.0**	**138.0**	**138.0**
Excess (Deficit) of SOM Faculty FTEs	**-**	**1.0**	**(1.0)**	**(3.0)**	**(11.0)**	**(14.0)**	**(15.0)**	**(8.0)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

[1] Faculty FTE funding calculations assume funding for the medical student enrollment increase due to the PRIME Program (24 to 28 students per year) beginning in '08-'09, but do not assume funding for incremental growth in PhD students between '07-'08 and '11-'12. Funding for Ph.D. students will not be assumed as the medical school is currently not approved. Beginning in '12-'13 it is assumed the medical school will have approval and faculty funding for Ph.D. students will be allowed at the 18.7:1 metric.

[2] Community Based Faculty for 1st and 2nd year are reported beginning in initial year of school. Funding for community faculty currently used for clinical education of 1st and 2nd year students is provided by support from UCLA and UCR. Current funding sources for these faculty will be discontinued upon inception of UCR medical school.

In accordance with existing practice, formal search committees will be assembled to identify and recruit faculty. The research leader faculty will also be instrumental in hiring basic science/clinical research scientist faculty. A particular focus of recruiting will be enhancing faculty diversity by ensuring equity and equal opportunity for all qualified candidates and removing the barriers to full participation that have historically existed in California and nationwide. One of the first steps in achieving a diverse faculty will be the appointment of the senior associate dean of diversity, outreach, and community partnerships. This senior associate dean will be the point person for advancement and timely completion of academically related diversity and affirmative action initiatives and for coordinating with relevant systemwide initiatives. A more expansive discussion of the medical school's commitment to diversity can be found in Part III Chapter III.

Compensation and Advancement

Compensation – Faculty compensation will adhere to the guidelines established by the Board of Regents in its July 1999 approval of the Health Sciences Compensation Plan, which outlines the academic series included and their membership status in the Academic Senate. (See Appendix C). In the case of public medical schools, faculty salaries are funded by a variety of sources, including state funds, grants and contracts, revenue from patient care services, endowed professorships, and private funds. The mix of funding sources varies widely among individual compensation packages, depending on the type of faculty. In all cases, the state-funded portion of a salary is leveraged by the faculty members' ability to bring outside funds into the medical school through research and/or clinical practice. For the UCR School of Medicine, clinical income will be a necessary revenue source to compensate clinical faculty. The specific methods of generating funds for clinical faculty compensation will be modeled following approval of the medical school. (See Part III, Chapter VII).

Advancement – The UCR medical school will follow the academic advancement policies established by the University of California for health sciences faculty.

Faculty Development

The senior associate dean for academic affairs will be responsible for the oversight and administration of all faculty development activities for the medical school. Committed to the vision of becoming a recognized leader for excellence in training future physicians, the medical school will consider faculty development crucial to its success. Faculty development activities will include, but are not limited to, mentoring on academic and career guidance, continuing education, teaching evaluations and assessments, support services for grants and awards, recertification programs, and research resources. This professional development will also assist community faculty to sharpen teaching skills.

In addition to classroom learning, clinical training will be a significant component of the medical school's commitment to medical education. As a result, an additional set of faculty development requirements for clinical faculty will be formulated. These activities and associated responsibilities will be included in the affiliation agreements.

Assumptions and Financial Model for Faculty Growth and Compensation

Medical school faculty will grow from the current level of 14 FTE positions to 138 FTE positions, comprised of varying levels of ladder rank, non-ladder rank, and clinical physicians. The financial model for faculty growth and compensation, outlined in detail in Part IV, takes into account the instructional time needed by type of faculty to deliver the curriculum (Part III, Chapter IV), the initial complement funding necessary to recruit faculty, and projected compensation levels in accordance with the University of California Health Sciences Compensation Plan.

Funding sources for faculty compensation will include state funds (both enrollment-driven and investment), grants and contracts, endowed professorships, and revenue from the patient care services. Excluding clinical revenue, which will be modeled once the medical school is approved, faculty salaries and benefits reach a level of approximately $25 million in 2020-21. It is estimated the incremental faculty practice plan will require an additional $29.6 million by 2020-21 to cover the salaries, wages, and benefits of clinical faculty.

CHAPTER III. COMMITMENT TO DIVERSITY AND AFFIRMATIVE ACTION

The UCR School of Medicine has an unprecedented opportunity to establish an academic institution that serves the gender and ethnic diversity of the state of California. Responsive to the mission, the medical school will build on UCR's success in achieving diversity among its undergraduate student body and on recent gains in faculty and graduate student diversity. This element of the mission has been incorporated into all aspects of medical school planning in order to identify and ensure the availability of resources to achieve this goal.

The goals set forth by the UCR School of Medicine are in harmony with the UC Board of Regents' affirmation in September 2007 that diversity is fundamental to UC's mission and integral to achieving excellence in the university. The Regents' statement said, in part: "Diversity—a defining feature of California's past, present, and future—refers to the variety of personal experiences, values, and worldviews that arise from differences of culture and circumstance. Such differences include race, ethnicity, gender, age, religion, language, abilities/disabilities, sexual orientation, socioeconomic status, and geographic region… and more…" UCR embraces the Regents' statement and recognizes that diversity is a source of intellectual wealth for our institution.

According to fall 2006 enrollment data, UCR has the second highest percentage of underrepresented minorities (Native American, African American, Hispanic) in the UC system, with the undergraduate population at 32.3 percent. Since 2005, approximately 25 percent of the matriculating students in the UCR/UCLA Program have self-identified as underrepresented minorities (URMs). In spring 2007, under federal guidelines, UCR became eligible for consideration as a Hispanic Serving Institution.

The Thomas Haider Program in Biomedical Sciences (UCR/UCLA Program)

Thirty years ago, UCR established the Biomedical Sciences Program in conjunction with the David Geffen School of Medicine at UCLA. Later named for a Riverside spine surgeon who has long supported the program, the Thomas Haider Program in Biomedical Sciences (UCR/UCLA Program) provides a unique path of entrance to one of the country's leading medical schools. A cohort of 24 UCR graduates is chosen each year from all majors to participate in this medical school program. Students receive their first two years of medical education at UCR and the remaining two years at UCLA, from which they receive their M.D. degrees. This program is an excellent foundation for expanding to an LCME-accredited four-year medical school.

In 2003, the program redefined its mission "to train graduates for distinguished medical careers in service to the people of California with an emphasis on the needs of the underserved, inland, and rural populations." To fulfill its mission, the Division of Biomedical Sciences initiated outreach programs (including FastStart and the Medical Scholars Program) designed to provide academic support and mentorship to socio-economically disadvantaged and underrepresented minority students at UCR and to facilitate their application and matriculation into medical school or allied health careers.

Affirmative Action – Faculty and Postdoctoral Scholars

Race, ethnicity, and gender may be considered in setting affirmative action goals in employment. As a federal contractor, UC is required to compare its minority and female workforce to minorities and women with requisite skills in the labor force. If there is under-utilization of minorities or women in the UC workforce compared to the labor force, the university must set goals (not quotas) to correct the underutilization, and must make good faith efforts (not give preferences) toward achieving the goals. These factors may be considered when planning a strategy for outreach, in order to create an inclusive pool of applicants.

In accordance with federal regulations, UCR will develop annual placement goals for faculty and postdoctoral scholars. By definition, placement goals are reasonable, attainable objectives that are used to measure progress toward achieving equal employment opportunities. Setting placement goals does not provide a justification to: a) extend a preference to any individual on the basis of gender, race, or ethnicity; b) create set asides for specific groups; c) supersede merit selection principles; or d) select a less qualified person in preference of a more qualified person.

Faculty – In 2006, the campus ranked third in the UC system for faculty diversity, with 9 percent underrepresented minorities among the ladder rank faculty. With the medical school, UCR has an opportunity to start afresh in achieving both diversity and gender equity. Recruitment efforts and resources will be broad and inclusive, aligned with the goal of recruiting qualified women and individuals from unrepresented minority groups into faculty positions. This is particularly important because faculty serve as role models to attract a diverse student body. Across the nation in 2003, approximately 1,100 URMs with science and engineering doctorates held positions in medical schools and medical centers.[34] At that time, this represented approximately 9 percent of the total doctorate holders employed in medical schools and medical centers at U.S. academic institutions. Among women ladder-rank faculty at UC, representation varies widely in different fields. This variation is especially noticeable in the health sciences, ranging from 20 percent in medicine to 93 percent in nursing. In terms of the pipeline, women represented approximately 50 percent of the medical graduates and medical residents at the UC schools of medicine. The UCR medical school supports the recommendations of the Josiah Macy, Jr. Foundation, which has set a goal for women in academic medicine to comprise 50 percent of medical school division chiefs, department chairs, and deans. With this background, and to support faculty diversity, the medical school will set placement goals for women and minorities in faculty positions in accordance with the requirements of the federal affirmative action regulations.

Postdoctoral Scholars – The UCR medical school recognizes that the recruitment and training of women and minority postdoctoral scholars is crucial to increasing the pipeline for potential faculty. Unfortunately, the proportion of URMs at the postdoctoral level is strikingly low. Domestic URMs comprise 8 percent of the domestic postdoctoral population and approximately 4 percent of the postdoctoral population as a whole. As of 2004, no more than 5 percent of

[34] National Science Foundation, Division of Science Resources Statistics. Women, Minorities, and Persons with Disabilities in Science and Engineering: 2007, NSF 07-315 (Arlington, VA; February 2007). http://www.nsf.gov/statistics/wmpd/.

doctoral recipients in Science, Technology, Engineering and Mathematics (STEM) fields were URMs.[35] In medicine in fall 2005, only 95 of 2,264 (4.2 percent) UC postdoctoral scholars were URMs. The proportion of women in postdoctoral appointments, however, is highest in medicine. The UCR medical school will set placement goals for its postdoctoral scholars to match availability, in accordance with federal affirmative action guidelines.

In appointing faculty and postdoctoral scholars, the UCR School of Medicine will consider faculty contributions to diversity and equal opportunity. This is important as all faculty should demonstrate proficiency in the skills necessary to further the diversity mission of the school. Guidelines from the UC Office of the President enable search committees to give special consideration to a number of factors in faculty and academic appointments. These include, but are not limited to:

- Service to increase participation in science by groups underrepresented in their field, for example an exceptional record mentoring students and junior faculty from groups under-represented in their field;

- Understanding of the barriers facing women and domestic minorities in science careers, as evidenced by life experiences and educational background;

- Significant experience teaching students who are underrepresented in the sciences, for example teaching at a minority serving institution; and

- Potential to bring to their research the creative critical discourse that comes from their non-traditional educational background or training, and/or their experience as a member of a group underrepresented in science.

Diversity – Medical and Doctoral Students

Consistent with recommendations of various national organizations, such as the AAMC and the Josiah Macy, Jr. Foundation, UCR aspires to achieve within the medical student classes and Ph.D. programs diversity that will serve the population of California. In accordance with the Regents' statement, UCR will maintain and develop programs designed to eliminate the barriers that prevent full participation of underrepresented and minority students in the medical school.

According to AAMC 2007 data for matriculants to U.S. medical schools, 15.7 percent of all students identified as American Indian or Alaskan Native, Black or African American, Hispanic or Latino, or Native Hawaiian and Other Pacific Islander.[36] In the fall of 2005, URMs comprised 17 percent of new enrollments in UC medical school M.D. programs. Women were represented at parity with men in medicine, at approximately 50 percent.

At UC, the proportion of URMs decreases steadily with successively higher levels of the academic community (e.g., from high school graduates to undergraduate students to graduate/professional students to postdoctoral students to faculty). Approximately 17 percent of

[35] http://cohesion.rice.edu/CentersandInst/Advance/emplibrary/Diversify%20STEM.ppt#323,9,Faculty Diversity
[36] http://www.aamc.org/newsroom/pressrel/2007/appsenrollcharts.pdf

potentially qualified undergraduate degree holders are URMs; this drops to 12 percent for enrolled graduate and professional program students, with the fraction of URMs decreasing steadily at later academic stages. Enrollments in the graduate student ranks of URMs vary substantially across disciplines, with dramatically lower proportions in STEM fields than in overall university levels. For instance, of the 1,701 new UC graduate enrollments in life sciences in the fall of 2005, only 160 were URMs. The STEM fields also exhibit a lower portion of women at the graduate levels (Ph.D.). Women are well represented at the baccalaureate level, i.e., 56 percent of bachelor's degree recipients and 53 percent of new graduate enrollments at UC.

Since 2005, approximately 25 percent of the matriculating students in the UCR/UCLA Program have self-identified as URMs. The UCR School of Medicine will strive to meet or increase the diversity that the UCR/UCLA Program has achieved in the past few years by continuing inclusive outreach efforts, by developing curricular programs that will serve the diversity of the state and by sustaining programs that eliminate barriers to access to medical education. The School of Medicine will maintain and expand established programs, such as the Medical Scholars Program and FastStart, in addition to developing new programs that will expand the pipeline into medical school.

The Regents identified graduate student diversity as one of four critical areas for maintaining academic excellence. With this background as well as guidelines from the UC Office the President, the UCR School of Medicine will develop criteria for decisions on medical and doctoral student admissions and financial support that demonstrate a prospective graduate student's contribution to UCR's diversity mission. These factors include:

- Involvement in service efforts or programs to increase participation in science, education, humanities, fine arts, or social sciences by groups historically underrepresented in higher education; for example, participation in programs designed to address diversity and equity in higher education such as the Society for Advancement of Chicanos and Native Americans in Science;

- Potential to contribute to their graduate program through their understanding of the barriers facing women, domestic minorities, students with disabilities, and other members of groups underrepresented in higher education careers, as evidenced by life experiences and educational background;

- Drive and motivation to persist and succeed in their careers despite barriers in higher education that disproportionately disadvantage them; and/or

- Communication skills and cross-cultural abilities to maximize effective collaboration with a diverse cross-section of the academic community.

Thus, the UCR School of Medicine will achieve diversity in its student body by seeking those who demonstrate a commitment to the school's mission of serving the medically underserved. Such students may be from underserved areas, or may have the cultural competencies and life experiences to make them strong candidates for recruitment.

Student and Pipeline Programs

UCR has developed the following programs to expand the pipeline of diverse students and ensure their success.

- **Haider Program:** With the opening of the UCR School of Medicine in 2012, this program will serve as a unique portal into medical school. Through a competitive process, the program will continue to admit up to 24 UCR undergraduates each year into the medical school. The Haider Program will also develop new initiatives and support for identifying high school students with interest in careers in health sciences and opportunities to enroll at UCR. Such an approach facilitates the solidification of the "pipeline" from the Inland Southern California community to UCR, on to the UCR School of Medicine, and then potential residency and eventual practice in Inland Southern California.

- **Health Sciences Partnership (HSP) Program:** The HSP program involves 50-60 UCR students mentoring 250 disadvantaged 9^{th}-12^{th} grade high school students who are currently enrolled in Health Academy Programs in Inland Southern California. High school students benefit from one-on-one or small group counseling and mentoring from college-level science students. They also visit colleges and universities to learn about the educational requirements and opportunities for future health care careers. The student mentor program is a challenging and rewarding experience for the UCR students while also encouraging disadvantaged high school students to pursue a career in science.

- **FastStart:** FastStart is an intensive five-week summer residential learning experience designed for incoming UCR freshmen who aspire to medical and other science-based careers. FastStart provides socio-economically disadvantaged students with reinforcement in mathematics, biology, and chemistry. It also provides workshops in study skills, campus resources, ethics, and other enrichment opportunities. Student-level staff provide academic and adjustment guidance to FastStart students. Participants also have the opportunity to visit local hospitals and interact with medical professionals. The program's goal is to increase the number of disadvantaged students who pursue such careers and to provide the academic and social support needed to help students persist and succeed in their higher education goals. FastStart is supported by a grant from The California Wellness Foundation and private sponsors. Participants in the FastStart program are approximately 60 percent underrepresented minorities.

- **Medical Scholars Program (MSP):** MSP is designed to increase the diversity of students who succeed in their B.S. or B.A. training and achieve their goal of entering medical school or allied health disciplines. This program works with students throughout their undergraduate years at UCR. For freshmen students, the MSP offers study groups, peer mentors, advising seminars with faculty members, and workshops on career and academic planning. For MSP students in their sophomore, junior, or senior years, the program sponsors seminar classes in such topics as health careers, health care disparities, and leadership, as well as workshops on writing the personal statement and interviewing skills, financial support for Medical College Admission Test (MCAT) preparation, and

guidance in filling out the American Medical College Application Service (AMCAS) application. Faculty and staff provide individualized student counseling with attention to academic, career, and personal advising. While many students begin the program as freshmen, transfer and upper class students are also encouraged to join the program. Currently, participants in the MSP program are approximately 60 percent underrepresented minorities. The MSP is being expanded through grants from the Howard Hughes Medical Institute, The California Endowment, and private sponsors.

- **Postbaccalaureate Program (Postbac):** Postbac is a new initiative in the process of recruiting its first class of six to eight students to begin in July 2008. Funded by a grant from The California Endowment, the goal is to recruit disadvantaged students with B.S./B.A. degrees who dream of becoming physicians to serve underserved populations, but who need individualized academic and mentorship support in order to become competitive medical school applicants. This 12-month program will include an intensive summer component designed to improve study, research, and critical thinking/test taking skills in preparation for the MCAT; significant counseling support to assist in preparing competitive medical school applications; access to and instructional assistance with upper division science courses to increase their grade point average; and professional development seminars.

Other Programs

- **Scholarship Funds:** Specific scholarships funded by student fees will be allocated to support the financial needs, and thus reduce the debt burden, of educationally and economically disadvantaged students. Additional private scholarships will be generated through fundraising with an initial target of $10 million.

- **Dean's Office and Staff:** The dean's office will include staff and faculty with specific responsibilities for addressing the diversity mission of the medical school. The position of senior associate dean of diversity, outreach, and community partnerships will be established and supported in addition to support staff in the offices of the senior associate deans of academic affairs and student affairs. Each of these senior associate deans will have responsibilities aligned with the diversity element of the School of Medicine mission, as will the dean.

- **Grants:** Resources have been identified to support the pursuit of grants and awards that fund programs for student success, particularly the educationally disadvantaged.

- **Community Involvement in Clinical Education and Training:** Community service projects and community-based clinical training are required in the third and fourth years of the medical education curriculum. These commitments will benefit students, faculty, the university, and Inland Southern California by exposing students to community health issues in the diverse region while providing opportunities to develop future leaders.

- **PRIME Student Funding:** The School of Medicine will continue to implement the state PRIME program through student enrollment. Each year, the PRIME program will

allocate state funds to support four students who have demonstrated their commitment to practicing in underserved areas. This UC-wide program focuses on improving the health of underserved communities within the state by offering specialized education, training, and support for students pursuing a medical career focused on caring for the underserved.

Financial Investment

The estimated initial investment for a diverse student body and affirmative action is depicted in Table 3. Program costs for the Haider Program, HSP, MSP, FastStart, and Postbac and the staff required to administer the programs are represented on lines 1 and 2. Scholarships for students with financial need will be generated by targeting over $1 million from student fees (line 3). The dean's office includes a portion of the salaries for the senior associate deans, $235,000 per dean, in addition to five administrative support staff dedicated to the diversity efforts (line 4). PRIME student funding includes funding of $25,600 per student for eight students (line 5). Support for grant pursuits represents the cost for a grant writer to support writing grants to further programs for URMs (line 6). Student community project funds are a reflection of the 3rd and 4th year community projects' cost reflected in the curriculum (line 7). Faculty recruitment funds are targeted for the initial complement to ensure that faculty recruitment efforts are inclusive of URMs and women (line 8). Finally, $10 million in scholarships was identified as a fundraising goal for scholarships for economically and educationally disadvantaged students with financial need and students whose background and experience make them especially qualified to serve the diversity of the state and populations in medically underserved communities (line 9).

Table 3. Estimated Budgeted Resources Dedicated to Diversity/Underserved Population Mission

Item	Identified Area	Total $
1)	Program Costs	$832,000
2)	Staff for Student Support Programs	$320,000
3)	Scholarships (from student fees)	$1,165,000
4)	Dean's Office	$619,000
5)	PRIME Student Funding	$205,000
6)	Support for Grant Pursuits	$64,000
7)	Student Community Projects	$520,000
	Ongoing Operational Costs	**$3,725,000**
8)	**Faculty Recruitment**	**$5,160,000**
9)	**Fundraising Goal - Need-Based Scholarships**	**$10,000,000**

As can be seen from Table 3, at maturity, more than $3.7 million of ongoing operating costs and $15 million of strategic investments have been identified to support scholarships, recruit a diverse student body and faculty, and develop and implement diversity programs. UCR will be directing funds to programs that will assure that its recruitment and retention efforts are inclusive of underrepresented minorities and women, and will seek other support dollars from grants, foundations, and individuals.

CHAPTER IV. CURRICULUM

Founded in 1974 in conjunction with the David Geffen School of Medicine at UCLA, the UCR/UCLA Thomas Haider Program in Biomedical Sciences is a strong foundation on which to build an LCME-accredited, four-year medical school. Nearly 700 students have received their M.D. degrees through the program. Early this decade, it reformulated its mission with a focus on preparing graduates to serve the needs of underserved, inland, and rural populations, and it developed innovative programs that have diversified the medical student cohort.

Medical Education Mission Statement

> *The UCR School of Medicine seeks to prepare our graduates for distinguished careers in clinical practice, teaching, research, and public service. Recognizing that medical school is but one phase in a physician's education, we must create an environment that prepares students for a future in which scientific knowledge, societal values, and human needs are ever changing.*

The Curriculum

The proposed UCR School of Medicine curriculum includes a recently revised curriculum currently received by students in the UCR/UCLA Program. Years 1 and 2 are essentially the first and second years of the LCME-accredited UCR/UCLA Program curriculum that have been adapted to UCR's distributed clinical model. Clinical instruction is an integral portion of Years 1 and 2, in contrast to the more traditional focus on basic sciences offered at other institutions. Years 3 and 4 provide the necessary clerkship experiences in medical centers and community-based settings, as well as other opportunities in health sciences. Table 4 provides a brief overview of the proposed curriculum.

Table 4. Proposed School of Medicine Curriculum

<table>
<tr><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th></tr>
<tr><td>• Orientation to HB&D
• Block 1: Foundations of Medicine
• Block 2: Cardiovascular, Renal & Respiratory Medicine I
• Block 3: Gastrointestinal, Endocrine & Reproductive Medicine I
• Block 4: Musculoskeletal Medicine
• Block 5: Clinical Neurosciences I</td><td>• Block 6: Infectious Diseases
• Block 7: Gastrointestinal, Endocrine & Reproductive Medicine II
• Block 8: Clinical Neurosciences II
• Block 9: Cardiovascular, Renal & Respiratory Medicine II
• Block 10: Integrative Assessment</td><td rowspan="2">• Clinical Foundations (2 weeks)
• Medical Ctr-based Clerkships (26 weeks)
• Community-based Clerkships (26 weeks)
• Doctoring 3
• Longitudinal Radiology Course
• Longitudinal Advisor / Mentorship
• Case Based Learning, Web Based Cases, PBL</td><td rowspan="2">• Medical Academies
o Community / Primary Care
o Acute Care
o Applied Anatomy
o Medical Sciences
• Electives (4 months)
• Seminar Series
• Required Clinical Experiences (4 mo.)
o Advanced IM, Surgery, Acute Medicine & Community Based Medicine
• Community Service Project
• Scholarly Project</td></tr>
<tr><td colspan="2">Doctoring, PBL & Clinical Skills incorporated into each block, except orientation and Block 10</td></tr>
</table>

Proposed Curriculum Overview and Teaching Requirements

Years 1 and 2 – Years 1 and 2 are a sequentially taught block-based, integrated approach to the science of human biology and disease. Normal human biology is integrated with disease processes and clinical skills from the first week of medical school. Year 1 will focus primarily on an interrelated approach to human biological systems, and Year 2 will focus on disease processes. Instruction is driven by cases explored in small groups (problem-based learning), laboratories, conferences, clinical skills workshops, and independent study settings. There is a maximum of 10 hours of lecture per week, and contact time is limited to 24 hours per week to allow time for independent study and electives. Longitudinal courses, Doctoring 1 and 2 and Introduction to Physical Exam (IPE), will be conducted throughout the first two years.

Years 3 and 4 – Year 3 begins by introducing students to a clinical foundations course. Half of the students will begin their clinical clerkships in the medical-center based part of the curriculum, and half of the students will begin their clinical clerkships in the community-based part of the curriculum. During all of the clinical rotations, students are supervised by clinical faculty. Additionally, students will have a community service rotation with exposure to the delivery of medical care in the medically underserved region. One day a week, students will return to UCR for longitudinal courses such as doctoring, imaging, advisor/mentorship program, problem-based learning, and case-based education.

In Year 4, students will choose an "Academy." The Academy is a society of faculty and students with common career interests where faculty can provide appropriate career advice and mentoring, coordinate longitudinal experiences through preceptorship and creative projects, guide choices of electives and selectives, assure completion of fourth-year requirements, and help develop the senior project. The fourth year will have structured clinical clerkships, selectives, a community service project, and a scholarly project.

A full description of the proposed School of Medicine curriculum can be found in Appendix D.

Curriculum Assumptions and Financial Model

In order to support the delivery of this curriculum, the required faculty time was analyzed to consider the need for the first- and second-year basic science teaching, and the third- and fourth-year clinical teaching. The delivery of the first two years of the curriculum will require faculty to deliver lectures and facilitate problem-based learning (PBL), lab sessions, doctoring, tutoring groups, and clinical skills sessions. UCR faculty will work in conjunction with community physicians to provide teaching for the community-based clerkships in the third year and the required advanced clerkships in the fourth year. The hours required were translated into an FTE need, based on the requirements for the different enrollment projections. The associated faculty salaries for these FTEs will be funded by a combination of state funding and grant support.

In order to deliver the first two years of basic science and clinical education, the financial model calculated the number of UCR faculty required in addition to the stipend dollars needed for voluntary faculty. The dollars where calculated in the financial model and converted to FTEs.

The delivery of the third- and fourth-year teaching program will require significantly more involvement of clinical and community faculty. In addition, these clinical faculty will be needed to support the unique training requirements of the residency programs to be offered. Third- and fourth-year teaching requirements, along with the associated FTE and cost assumptions, are illustrated in Table 5. These numbers assume the presence of a graduate medical education (GME) program, and the associated residents are part of the "teaching model" for the third- and fourth-year clinical educational program.

Table 5. Third-Year and Fourth-Year Teaching Requirements

Faculty Categories	Assumptions
GME Program Directors, Associate Program Directors, and Other Core Faculty	▪ Based on Residency Review Committee requirements and program-specific student to faculty ratios
Clerkship Directors	▪ One person assumed for Medicine, Family Medicine, Pediatrics, Psychiatry, General Surgery, OBGYN, Emergency Medicine, and Neurology
Clinical Foundations Instructors	▪ Based on 2 weeks teaching and 2 weeks prep, with some flexibility for additional time/staff that may need to be involved
Longitudinal Radiology Instructors	▪ Based on ½-day teaching and ½-day prep every other week for the full year
Doctoring 3 Course Director	▪ 0.4 FTE to coordinate the necessary lecturers/faculty and course activities
Doctoring 3 Instructors	▪ Persons based on ratio of eight students to one faculty person ▪ Time based on ½-day teaching and ½-day prep every other week for the full year
Longitudinal Advisor / Mentorship	▪ Persons based on ratio of four students to one faculty mentor ▪ Time based on mentors having four sessions per year with their students, lasting 1 hour per session per student
Attendings for 3rd year medical center-based clerkship rotations	▪ Faculty FTE already accounted for in GME faculty projections ▪ Students will be part of learning teams with residents and attendings
Preceptors for 3rd year community based clerkship rotations	▪ Healthcare providers will be contracted to provide clerkship supervision and compensated at a rate of $100 per day per student ▪ Persons based on a ratio of one student to one faculty preceptor
Faculty leaders and support for 4th year academies, project coordination, and selective/elective experiences	▪ Each academy (four in total) will have one faculty leader responsible for coordination at 0.5 FTE ▪ Additional faculty support will be included at 0.25 FTE per person
Faculty for coordination of 4th year special projects	▪ 1.0 FTE to catalog research opportunities and help support students' research interests
Attendings for 4th year required advanced clerkship rotations	▪ For Internal Medicine and Surgery, faculty already accounted for in GME ▪ For the Acute Medicine and Community Based Medicine rotations, healthcare providers will be contracted to provide clerkship supervision and compensated at a rate of $100 per day per student

FTE calculations were based on the estimated time needed to accomplish each particular clerkship administrative activity or piece of the curriculum. Core clinical faculty will serve as clerkship directors and advisors, and teach the didactic portions of the Clinical Foundations, Longitudinal Radiology, and Doctoring 3 courses in the third year of medical education. For the fourth year of medical education, core faculty will oversee each of the four medical academies, the fourth-year special project, and elective clerkship rotations. The associated preliminary clinical faculty projections for Years 3 and 4 are shown in Table 6.

Table 6. Preliminary Clinical Faculty Projections

Clinical Physician Faculty Needs Annually (FTE) - Year 3 Curriculum	Year 3 – Enrollment of 50	Year 3 – Enrollment of 100	Assumption
Clinical Foundations	0.2	0.2	Two week lecture-style course
Longitudinal Radiology	0.2	0.2	Course runs over entire year, every other week
Doctoring 3 Course Director	0.4	0.4	One director to oversee course
Doctoring 3 Faculty	0.6	1.3	Eight students per group / faculty leader
Longitudinal Mentorship	0.1	0.2	Four students per faculty mentor, at least four sessions per year
Specialty-Specific Clerkship Directors	4.3	6.5	One director per distinct specialty
Hospital-Based Rotations			Faculty estimated for the GME programs will also be responsible as preceptors for the 3rd year hospital-based rotations
Community-Based Rotations			Community-based physicians will be compensated a stipend on the basis of $100 per day per student for serving as preceptors for the 3rd year community-based rotations

Clinical Physician Faculty Needs Annually (FTE) - Year 4 Curriculum	Year 4 – Enrollment of 50	Year 4 – Enrollment of 100	Assumption
Academy Directors			Faculty leader plus support faculty
4th Year Elective Clerkship Experiences	3	4	Academy directors are also responsible for coordinating 4th year elective rotations
4th Year Special Project	1	1	Faculty needed to oversee and coordinate the completion of the students' 4th year special project
Required 4th Year Clerkship Experiences			Faculty estimated for the GME programs will also be responsible as preceptors for the 4th year required rotations in Internal Medicine and Surgery
			Community-based physicians will be paid a stipend to serve as preceptors for the 4th year Acute Medicine and Community-Based required rotations

Clinical Faculty Needs (FTE) Totals	Enrollment of 50	Enrollment of 100	Assumption
Totals	9.8	13.8	Represents FTEs, not actual number of clinical physician faculty

Clinical faculty projections are not representative of total persons needed, as these FTEs will likely be spread across many different persons. The community-based dollars were calculated on an estimated stipend of $100 per day per student paid to a community-based physician to serve as a preceptor for the clerkship rotations or to support community-based experiences and projects. Each student will rotate through every community-based rotation at some point during the year. The FTE estimates of faculty for third- and fourth-year teaching requirements are illustrated in Table 7.

Table 7. Estimation of Faculty Needed to Support Third- and Fourth-Year Medical Education and Graduate Medical Education

ENROLLMENT SUMMARY	09-'10	'10 - '11	'11 - '12	'12 - '13	'13 - '14	'14-'15	'15-'16	'16-'17	'17-'18	'18-'19	'19-'20	'20-'21	'21-'22
3rd Year Student Enrollment		0	0	0	0	50	50	100	100	100	100	100	100
4th Year Student Enrollment		0	0	0	0	0	50	50	100	100	100	100	100

FTE SUMMARY	'09-'10	'10 - '11	'11 - '12	'12 - '13	'13 - '14	'14-'15	'15-'16	'16-'17	'17-'18	'18-'19	'19-'20	'20-'21	'21-'22
Total FTE Faculty Needed for GME Programs	0.68	2.05	4.98	11.13	16.18	22.18	24.88	27.33	28.90	28.90	28.90	28.90	28.90
Total FTE Faculty Needed for Clerkship Directors	0.00	0.00	0.00	0.00	0.00	4.25	4.25	6.50	6.50	6.50	6.50	6.50	6.50
Additional FTE Faculty Needed for Year 3 Curriculum	0.00	0.00	0.00	0.00	0.00	1.46	1.46	2.18	2.18	2.18	2.18	2.18	2.18
FTE Faculty Needed for Year 4 Curriculum	0.00	0.00	0.00	0.00	0.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00
Total FTE Faculty	**0.68**	**2.05**	**4.98**	**11.13**	**16.18**	**31.89**	**34.59**	**40.01**	**42.58**	**42.58**	**42.58**	**42.58**	**42.58**

CONTRACTUAL DOLLARS SUMMARY (in 000s)	'09-'10	'10 - '11	'11 - '12	'12 - '13	'13 - '14	'14-'15	'15-'16	'16-'17	'17-'18	'18-'19	'19-'20	'20-'21	'21-'22
Contractual Faculty Dollars for Year 3 Curriculum - Community Based Clerkships	$ -	$ -	$ -	$ -	$ -	$ 1,200	$ 1,200	$ 2,381	$ 2,381	$ 2,381	$ 2,381	$ 2,381	$ 2,381
Contractual Faculty Dollars for Year 4 Curriculum - Required Advanced Clerkships	$ -	$ -	$ -	$ -	$ -	$ -	$ 200	$ 200	$ 400	$ 400	$ 400	$ 400	$ 400
Total Contractual Faculty Dollars	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,200**	**$ 1,400**	**$ 2,581**	**$ 2,781**	**$ 2,781**	**$ 2,781**	**$ 2,781**	**$ 2,781**
Equivalent FTEs	0.00	0.00	0.00	0.00	0.00	10.49	12.24	22.57	24.32	24.32	24.32	24.32	24.32

CHAPTER V. POSTGRADUATE TRAINING PROGRAMS

Residents, interns, and fellows are considered postgraduate medical students (graduates of medical school) completing additional training in order to qualify for board certification and medical licensure. A resident is prepared to undertake independent medical practice within a chosen specialty upon the satisfactory completion of a residency. Residents participate in an allopathic training program accredited by the Accreditation Council for Graduate Medical Education (ACGME), which is responsible for accrediting graduate medical education (GME) programs. Residents may also complete additional training in a fellowship after completing their initial residency program, which can range from three to five years. Fellows typically complete educational requirements for certification by a specialty board recognized by the American Board of Medical Specialties (ABMS).

The UCR School of Medicine plans to sponsor new postgraduate training programs as part of its medical school. Such programs will provide the immediate benefit of satisfying part of the medical school mission of providing additional patient care access in Inland Southern California. This is because most training activities for residency programs occur in the clinical setting while delivering patient care under the supervision of a faculty attending. In addition, since residents and fellows tend to stay in the communities where they completed their postgraduate training, UCR will be fulfilling its commitment to enhance the physician workforce in the region.

Clerkship training is less expensive and more readily accomplished if UCR's third- and fourth-year medical students can utilize UCR's GME programs for needed experiences in the clinical setting. Further, education of medical students in clerkships with residents and attending physicians broadens students' exposure to educational opportunities and team building. It is expected that many of the clerkship experiences will eventually occur in conjunction with UCR's residency programs as part of a team-based approach in the clinical setting. This will provide additional learning opportunities and optimize the expenditure of funds for salaries.

GME Mission and Vision

Mission: *UCR will provide a high quality Graduate Medical Education program in support of the overall mission statement of the medical school.*

Vision: *UCR will establish a set of GME training programs that:*

- *Attract a diverse group of residents;*
- *Promote the recruitment and retention of physicians who are dedicated to serving Inland Southern California;*
- *Create high quality programs that develop cultural competency in service of the underserved populations in Inland Southern California;*
- *Provide a platform to support UCR clerkships; and*
- *Maintain the fiscal viability of its GME programs and support the valuable relationships with its health care provider partners.*

Medicare GME Reimbursement Overview

The federal Centers for Medicare and Medicaid Services (CMS) provide Medicare GME reimbursement to hospitals for the cost of training residents. GME reimbursement is comprised of two types of payments:

- **Direct Graduate Medical Education (DME) Payments:** Incremental costs incurred for GME including resident salaries, faculty teaching support, and administrative support such as the GME office expense and certain related overhead expenses such as gowns, beepers, etc.

- **Indirect Graduate Medical Education (IME) Payments:** Hospitals with accredited teaching programs receive an additional payment for a Medicare discharge to reflect the higher patient care costs of teaching hospitals relative to non-teaching hospitals.[37]

These payments are based on resident counts, submitted annually in the hospital's Medicare Cost Report. Levels of GME reimbursement vary dramatically by hospital, depending on patient mix and teaching intensity. The payments offset GME program costs including resident salaries, faculty teaching support, and indirect expenses attributed to GME training activities.

Rules have been established governing Medicare GME support, making it more difficult to receive payments to offset resident training costs. In 1997 the CMS instituted "caps" that limit the number of approved program positions based on a hospital's fiscal year 1996 cost report. Caps are set for each hospital and not each GME program. This will be an important factor in developing UCR postgraduate programs.

UCR's Distributed Clinical Model for Medical Education

The UCR School of Medicine approach to GME will embrace a distributed clinical model, meaning that UCR plans to partner with area hospitals as well as regional clinics and physician practices to support both GME and clerkship curriculum requirements. This approach is both consistent with the proposed mission and, at the same time, socially and economically advantageous. Utilizing a distributed model will allow UCR to train residents and medical students throughout Inland Southern California.

Initial GME Program Plan

UCR plans to establish its first residency programs beginning July 2012, prior to the start of the clerkship programs. Doing so will provide the initial support base and clinical training access to the third- and fourth-year medical students via the residency programs. As indicated in Table 8, the GME program is expected to start with a national recruitment of 26 residents, consisting of 16 first-year residents in internal medicine and 10 first-year residents in family practice. The number of residents will increase to 160 postgraduate students by July 2017. These programs represent primary care areas, which can help meet the immediate basic health care needs in

[37] CMS, www.cms.hhs.gov/AcuteInpatientPPS/07_ime.asp

underserved areas and provide the core for building other programs in the future. In particular, internal medicine is mandatory if any expansion into medical subspecialties such as cardiology or gastroenterology is planned in the future.

Table 8. Initial Residency Program Targets – Phase I[38]

GME Program	Prog Yrs	July 2008	July 2009	July 2010	July 2011	July 2012	July 2013	July 2014	July 2015	July 2016	July 2017	July 2018
Internal Medicine	3					16	32	48	48	48	48	48
Family Practice (Rural)	3						2	4	6	6	6	6
Family Practice (Urban)	3					10	20	30	30	30	30	30
Pediatrics	3							6	12	18	18	18
Psychiatry	4							3	6	9	12	12
General Surgery	5-6						6	12	18	24	30	30
OB/GYN	4							4	8	12	16	16
Totals					-	26	60	107	128	147	160	160

- Growth period for program
- Program at full size

Ultimately, UCR would like to expand its support of GME training into other more specialized training programs and double or triple in size over time as the medical school becomes more established and the needs of the region continue to demand such growth. However, the reliance on hospital affiliation support and the current cap restrictions on hospitals for Medicare GME funding hinder the ability to expand much beyond current plans in the next several years.

UCR has been in regular dialogue with leadership from Loma Linda University and Western University of Health Sciences to jointly plan and promote their GME initiatives. The workforce needs of the region are so great that the three institutions working together will still not meet the needs in the near term.

GME Implementation Timeline

Several key activities must occur prior to the start of any GME programs in order to gain accreditation, recruit faculty, and recruit students. Based on a July 2012 start date, the following steps must be completed by the time indicated in Table 9. Each residency program established by UCR will have similar set of milestones during this start-up period, triggered by the expected start date of GME training.

[38] UCR plans to expand the number of residents beyond 160 (Phase I), but for purposes of this business plan, only initial residency projections are shown. Phase II of GME will include more specialty training and sub-specialty postgraduate training.

Table 9. GME Implementation Timeline (Program Start July 2012)

Function	Key Chronological Milestones for Each GME Program	Date
GME Office and Program Administration	Hire GME program director and Designated Institutional Official	Jan. 2009
	Modified GME office structure in place	July 2010
	Hire/contract with faculty and staff	July 2010
	Hire internal medicine and family medicine program directors	Jan. 2010
	Hire GME office staff	July 2011
	Development of GME committee	July 2011
	Development of policies and procedures	July 2011
	Complete GME office structure	July 2012
	First site visit for sponsoring institution triggered	July 2012
Accreditation	Program Information Form (PIF) started	Sept. 2009
	Program Information Form completed and submitted	March 2010
	Initial review of PIF for ACGME application	June 2010
	Residency Review Committee site visit	Sept. 2010
	Program accreditation received	Winter 2011
Recruiting	Recruiting materials created and set for distribution	Winter 2011
	Begin recruiting first class of residents	Summer 2011
	Interviews of residency applicants	Nov. 2011
	Match Day	March 2012
	Post match slot fulfillment	March 2012
Affiliate Development	Begin negotiations with hospital and non-hospital affiliates	July 2009
	Create legal arrangements	Dec. 2009
	Obtain signed final affiliation agreements	July 2010
	Begin rotations	July 2012

Postgraduate Training Program Assumptions and Financial Model

Faculty for GME Teaching – To support the growth projections for the residency programs, faculty leadership will need to be in place approximately two and a half years prior to the start of resident rotations. In the case of the first two programs for internal medicine and family practice, the program directors will be hired by January 2010. Faculty leadership will have responsibility for developing the curriculum, establishing the location of required and elective rotations, and leading efforts to gain program accreditation. Additional faculty will be hired prior to the start of resident training. Annual growth is expected to occur each year through July 2017. By then, approximately 29 faculty FTEs will be in place to support GME teaching (excluding any other clinical duties), as shown in Table 10.

Table 10. Projected Timing of Faculty FTEs for GME Teaching

GME Program	Prog Yrs	July 2008	July 2009	July 2010	July 2011	July 2012	July 2013	July 2014	July 2015	July 2016	July 2017	July 2018
Internal Medicine	3		0.33	0.67	1.17	3.67	5.67	7.67	7.67	7.67	7.67	7.67
Family Practice (Rural)	3			0.35	0.70	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Family Practice (Urban)	3		0.35	0.70	1.40	2.80	3.50	4.90	4.90	4.90	4.90	4.90
Pediatrics	3				0.38	0.75	1.25	2.25	3.25	4.00	4.00	4.00
Psychiatry	4				0.33	0.67	1.17	1.42	1.67	1.92	2.17	2.17
General Surgery	5-6			0.33	0.67	1.17	2.02	2.87	3.72	4.57	5.42	5.42
OB/GYN	4				0.33	0.67	1.17	1.67	2.27	2.87	3.34	3.34
Totals		-	0.68	2.05	4.98	11.13	16.18	22.18	24.88	27.33	28.90	28.90

NOTE: Faculty FTEs for July 2009 represent half-year projections.

GME Administration – The UCR School of Medicine will establish a GME office responsible for the administrative oversight and academic quality of UCR's residency programs. The ACGME mandates such an office as part of the sponsoring institution's responsibility and accreditation. The GME office will consist of a designated institutional official (DIO), financial administrative officer, and two administrative support staff. In addition to the GME office, each specialty specific GME program will require a program coordinator. The salary and non-salary expenses for these functions are detailed in Appendix E, Exhibits 1-4.

GME Program Start-up Costs – The start-up costs for UCR to develop the targeted GME programs – incurred prior to the start of resident training programs – are estimated at $4.8 million. These expenses include the salaries for program directors, as well as any recruitment expenses associated with the hiring of faculty. As indicated in Table 11, the overall cost assumptions are inclusive of administrative salary and benefits. The GME office will also need to be in place prior to the start of any programs.

Table 11. Projections for a 2.5-Year Start-up Period Prior to the Inception of Resident Training

GME Program	Faculty Salaries & Benefits[1]	Admin. Salary & Benefits[2]	Recruiting Expense[3]	Total Start-up Costs
Internal Medicine	$ 422,468	$ 126,208	$ 75,000	$ 623,676
Family Practice Rural	455,873	126,208	75,000	657,081
Family Practice Urban	458,855	126,208	75,000	660,063
Pediatrics	390,841	126,208	75,000	592,049
Psychiatry	394,169	126,208	75,000	595,377
General Surgery	720,632	126,208	75,000	921,840
OB/GYN	556,471	126,208	75,000	757,679
TOTALS	**$ 3,399,309**	**$ 883,456**	**$ 525,000**	**$ 4,807,765**

1 – Based on 2006 Medical Group Management Association (MGMA) compensation benchmarks for academic faculty and unless noted otherwise assumes 0.67 Program Director for two years and 0.50 FTE Associate Program Director for one year prior to residents beginning training.
2 – Administrative support $63,104 salary and benefits with one administrative assistant support.
3 – Recruitment expense of $75,000 is a one-time cost for faculty recruitment.

Funding Needs and Hospital Affiliations – Adequate revenue sources must be identified to cover the costs (Table 11) so that the financial viability for the GME training programs is maintained. UCR will receive state funding of approximately $27,000 per resident. As indicated in Table 12, however, the expected training costs per resident are significantly higher than state support levels. As a result, UCR must negotiate additional support from hospitals where residents will train through affiliation agreements; only hospitals are eligible to receive GME reimbursement. Expenses and potential offsetting revenue will also vary by program depending on the clinical training model established for each one.

Table 12. Initial Residency Program Target Enrollments

GME Program	Number Targeted Residents	Faculty FTE	Est. Annual GME Program Cost	Projected Cost Per Resident
Internal Medicine (General)	48	7.67	$ 6,970,023	$145,209
Family Medicine (Rural)	6	1.40	990,449	165,075
Family Medicine (Urban)	30	4.90	4,618,360	153,945
Pediatrics	18	4.00	2,986,392	165,911
Psychiatry	12	2.17	1,441,339	120,112
General Surgery	30	5.42	4,076,090	135,870
Obstetrics/Gynecology	16	3.34	2,088,512	130,532
TOTALS	**160**	**28.90**	**$23,171,164**	**$144,820**

Affiliation agreements typically include an amount of support per resident, which includes all the costs incurred by UCR, such as resident salaries, faculty teaching support, non-salary costs, and administrative overhead. The level of hospital support is contingent upon several factors, including:

- Direct Graduate Medical Education (DME) and Indirect Graduate Medical Education (IME) payment levels per resident (driven primarily by Medicare percentage);
- Financial performance in clinical settings/projected bottom line improvements of becoming a teaching program; and
- Indigent care requirements and available funding for uninsured care.

The GME office at UCR may be able to offer additional value beyond that which an affiliate can provide on its own (e.g., GME count support, CME opportunities, access to clinical trials, etc.). This will be an additional consideration in determining support levels.

Financial Summary

The GME program will require a period of initial investment during start-up and as the program ramps up to a total 160 postgraduate students annually by 2017-18. After ramp-up, the GME program is expected to operate at a break-even level if revenue assumptions are achieved. Table 13 highlights the projected economics of the GME program.

Table 13. Projected Economics of the GME Program

	Fiscal Year (in thousands)								
	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
GME Enterprise									
Identified Sources of Funding									
State Funds	$ -	$ -	$ -	$ 702	$ 1,620	$ 2,890	$ 3,457	$ 3,970	$ 4,321
GME Affiliation Revenue	$ -	$ -	$ -	$ 2,145	$ 4,950	$ 8,828	$ 10,560	$ 12,128	$ 13,200
Total Sources of Funds	**$ -**	**$ -**	**$ -**	**$ 2,847**	**$ 6,570**	**$ 11,717**	**$ 14,017**	**$ 16,098**	**$ 17,521**
Uses of Funds									
Faculty Salaries, Wages and Benefits	$ 192	$ 712	$ 1,329	$ 2,652	$ 3,705	$ 4,646	$ 5,263	$ 5,768	$ 6,288
Resident Salaries, Wages and Benefits	$ -	$ -	$ -	$ 1,352	$ 3,289	$ 6,123	$ 7,404	$ 8,678	$ 9,646
Staff Salaries, Wages and Benefits	$ -	$ 367	$ 638	$ 796	$ 796	$ 796	$ 796	$ 796	$ 796
S&E	$ -	$ 75	$ 150	$ 283	$ 333	$ 394	$ 471	$ 541	$ 589
Total Use of Funds	**$ 192**	**$ 1,154**	**$ 2,117**	**$ 5,083**	**$ 8,123**	**$ 11,959**	**$ 13,933**	**$ 15,782**	**$ 17,319**
Net Funding Excess (Deficit) for GME	**$ (192)**	**$ (1,154)**	**$ (2,117)**	**$ (2,236)**	**$ (1,553)**	**$ (241)**	**$ 84**	**$ 315**	**$ 202**

[1]All dollar amounts are uninflated based on '06-'07 dollar values.

[2]Sources and uses of funds after '17-'18 remain constant through '21-'22.

The critical revenue funding and operating expense assumptions driving the UCR GME program are listed as follows.

Funding Sources:

- **State Funds:** UCR will receive $27,008 per resident FTE from the state for resident training.

- **GME Affiliation Revenue:** UCR will negotiate agreements with hospital affiliates to receive an average of $82,500 per resident in GME payments to cover the residents' salaries and benefits and other costs associated with the training of the residents paid by UCR.

Uses of Funds:

- **Faculty Salaries, Wages and Benefits:** Salaries for the specialty-specific program directors, associate program directors, and other necessary GME faculty have been projected using Medical Group Management Association (MGMA) average compensation levels for academic physicians by specialty. The salaries range from approximately $137,000 to $277,000, depending on the specialty. Faculty fringe benefits are calculated at 18.5 percent.

- **Resident Salaries, Wages and Benefits:** Resident salaries are dependent on the postgraduate year (PGY) of the resident. Resident salaries in this projection range from $43,333 per PGY1 to $65,000 per PGY5. Resident fringe benefits are calculated at 20 percent.

- **Staff Salaries, Wages and Benefits:** Salaries are included for 4.0 FTE staff dedicated to the GME office, as well as 6.5 FTE staff assumed to be supporting each GME program director. Staff fringe benefits are calculated at 28 percent.

CHAPTER VI. RESEARCH ENTERPRISE

The School of Medicine will expand the current research base at UCR through recruitment and retention of clinical and basic science faculty and an enhanced infrastructure to support the research enterprise. Expanded basic science research will be accompanied by robust clinical and health care research that emphasizes population health, preventive medicine, and development of scientific knowledge to spur innovations in health care delivery. Consistent with UCR's longstanding land grant mission of addressing regional needs, the medical school will also focus on diseases and health issues specific to the region and the ethnic and cultural groups residing in Inland Southern California.

Research Enterprise Mission and Vision

Mission: *To promote innovative and eminent research programs recognized for excellence, stimulate the development of new scientists, and provide knowledge that improves the overall health and well-being of our surrounding communities.*

Vision: *To be recognized for outstanding science through a vibrant and successful research faculty and by facilitating interdisciplinary collaboration that will allow our scientists, clinicians and community to reach our goals of improving health outcomes.*

Operating Principles

The following principles will define research operations and drive on-going decisions:

- The School of Medicine will focus on research initiatives consistent with the overall mission.
- In keeping with UCR's land grant heritage, the medical school will strive to serve regional needs.
- Research will endeavor to improve human health through discovery, translation, commercialization, and application.
- Research priorities will be attentive to the National Institutes of Health (NIH) roadmap for medical research.
- The research enterprise will build and strengthen collaborations with other departments, centers, and institutes at UCR.
- The research enterprise will balance opportunistic (recruiting) vs. strategic (investment) growth opportunities.
- Partnerships with external sponsors (e.g., industry, pharmaceuticals) will be sought to build entrepreneurial opportunities and enhance regional economic growth.
- Research productivity metrics and expectations will be monitored and evaluated.
- Future applications and pursuits will be consistent with the medical school's research enterprise mission and vision.

Research Environment at UCR

Carnegie Ranking – The new classification by the Carnegie Foundation for the Advancement of Teaching ranks UCR as a research university with very high research activity, the highest category in the classification. The campus has a comprehensive research program and extensive graduate education programs, especially at the doctoral level. In fiscal year 2007, UCR received extramural funding for contracts and grants totaling $98 million, a 69 percent increase in funding since fiscal year 2001. Research activities on the UCR campus are supported through a range of sources including the National Institutes of Health (NIH), National Science Foundation (NSF), Centers for Disease Control and Prevention (CDC), and private sources.

Funding from federal agencies totaled $64.9 million in 2007, representing more than 66 percent of the total. Of the federal funding, $13 million in grants were from the NIH. State of California, non-profit, and UC contract and grant funds totaled $24 million; $9.2 million, or 9.4 percent, came from other governmental agencies and industry sponsors.[39]

Current Environment – Inland Southern California's medical needs will drive the growth and expansion of important biomedical research to improve human health. The School of Medicine research program will create a critical mass of researchers and clinicians that shares intellectual and physical resources to accelerate discovery and rapidly apply knowledge to help patients. Growing capabilities in an already mature university research campus will leverage existing strengths and synergies in the development of the medical school research program. The mature medical school research program will be a multi-purpose enterprise, housing top tier research and clinical scientists working in a collaborative environment where scientific achievements are shared with community, business, and educational leaders to stimulate creativity, increase educational outreach, and spawn commercial endeavors to facilitate regional commerce.

The UCR campus is uniquely positioned to rapidly expand existing programs, collaborations, and facilities to build a competitive and high caliber medical research program. Over the past decade, organized mammalian-based research initiatives have enhanced the awareness of ongoing research across departments and colleges, spurred successful equipment and graduate training grants, and resulted in the formation of successful new centers, such as the UCR Stem Cell Center. Recent hires in the areas of stem cell biology, biochemistry, and the biomedical sciences have further strengthened these interactions.

UCR faculty work on a variety of human diseases (e.g., cancer, Alzheimer's, Crohn's disease, cardiovascular disease, infectious disease, wound healing), systems (e.g., stem cell biology, mucosal immunology, signaling pathways, cell-cell interactions), and health-care delivery issues (e.g., patient-physician relationships, models for behavioral and physical interventions that can be used for optimal treatment of individual patients by health care professionals, cognitive changes in aging, eating behavior and weight control, health inequalities in cancer prevention and survivorship, rural health, and information technology). Faculty also utilize a range of techniques, including high throughput screening, protein modeling, and immunophysics. These strengths can serve as the foundation for a well-rounded medical research enterprise.

[39] *Sponsored Programs Activity Fiscal Year 2007 Annual Summary Report*, UCR Office of Research.

Facilities – Current research efforts are supported by a variety of existing highly specialized research and instrumentation facilities, including the:

- **Analytical Chemistry Instrumentation Facility:** Containing a variety of research instrumentation for the characterization of proteins and protein modifications including several mass spectrometers (such as a new GC-TOF mass spectrometer funded by an NSF grant), X-ray crystallography, NMR (nuclear magnetic resonance), and an optical facility with a wide array of instrumentation including ultraviolet, visible, near infrared, FTIR and Laser Raman.

- **Bioinformatics Core Facility:** Providing state-of-the-art bioinformatics and cheminformatic resources for large-scale comparative genomics, data mining, systems modeling, and drug discovery.

- **Central Facility for Advanced Microscopy and Microanalysis:** Containing two transmission electron microscopes and a scanning electron microscope for electron beam characterization of biological tissues.

- **Genomics Core Instrumentation Facility:** Containing research instrumentation for DNA sequencing, analysis of DNA libraries, and gene expression (quantitative PCR and phosphor/fluorescence imager) as well as a state-of-the art, high speed fluorescence-activated cell sorter (FACS Aria) for cell separation and analysis.

- **Microscopy and Imaging Core Facility:** Providing a comprehensive suite of confocal microscopes for three-dimensional imaging of cells and cell structures as well as a laser capture micro-dissection system allowing detailed analysis of specific areas within complex tissues (for example, tumor tissue within a normal organ).

- **W.M. Keck Proteomics Laboratory:** Providing state-of-the-art, high throughput characterization of cellular proteins including peptide sequencing and mass accuracy.

- **Animal Vivaria:** The campus has two existing vivaria with approximately 8,000 assignable square feet (asf) for animal housing as well as a new centralized vivarium facility (with an additional 8,000 asf) under construction in the Psychology building (expected completion summer 2008).

- **Statistical Consulting Collaboratory:** Provides statistical consulting and modeling to support decision-making in a variety of fields. The College of Natural and Agricultural Sciences is currently recruiting a health sciences statistician to aid in the design, interpretation, and validation of health-science related research.

These facilities, and the highly trained personnel who manage them, represent a significant resource to catalyze further expansion of biomedical research on campus and attract high caliber research scientists. Existing infrastructure also provides a platform to further develop facilities through future equipment grants, core grants, and industry partnerships.

Existing General Campus Research Organizations and Cooperative Relationships – UCR has built consistent momentum with research organizations and cooperative relationships to maximize resources and human and intellectual capital, as well as encourage cross-campus interactions among faculty. Medical school research faculty will interact with campus faculty through existing centers and institutes and attract additional funding to enhance and expand existing programs. Existing centers and institutes include:

- **Institute for Integrative Genome Biology:** Approximately 100 UCR faculty participate in the institute, which has the mission of creating and applying new knowledge to benefit agriculture, the environment, and human health through an integrated, systems-based scientific strategy. The institute fosters the development of systems-based biology encompassing genomics, proteomics, bioinformatics, and advanced visual microscopy.

- **Center for Nanoscale Science and Engineering:** This cross-college center brings together scientists from the disciplines of chemistry, physics, biology, engineering and cell biology/neuroscience to bring about advances in electronics, computing, communications, engineering materials, and medicine.

- **Center for Disease-Vector Research:** The center includes researchers studying vector-pathogen systems at the molecular, genetic and ecological levels. It functions as a catalyst fostering communication and idea cross-pollination between participating units and initiating collaborative research.

- **Stem Cell Center:** Research focuses on understanding the basic mechanisms that control stem cell function and deciphering how the tremendous potential of stem cells can be used to improve human health. More than 30 UCR faculty participate in the center, which has generated more than $6 million in research support since its formation in 2007.

UCR Research Working Groups – In addition to formal centers and institutes, the campus has multiple faculty working groups focused on common areas of research interest that can potentially serve as a catalyst for future development. These working groups largely consist of informal associations between departmental, intra-departmental, or cross-college faculty. In some cases, these faculty interactions have matured to include monthly standing meetings between lab groups (graduate students, postdoctoral trainees, and lab leaders) where data, ideas, and techniques are shared. One such example is the mSTART group (mammalian signal transduction and regulation of transcription).[40] A list of research working groups is summarized below:

- **Macromolecular Structure/Function:** Studies of the relationship of structure at atomic-level resolution to function in biological systems such as enzymes and electron-transfer complexes. Funded by NIH.

- **Regulation of Gene Expression and Signal Transduction:** Studies of gene expression, particularly as they relate to mammalian cell proliferation and differentiation, body pattern formation, hematopoiesis and response to DNA damage. Studies of steroid

[40] http://mstart.ucr.edu/

hormone function (in particular of the vitamin D family of compounds), signaling pathways in bone formation and the role of protein phosphorylation/dephosphorylation in cellular response to external stimuli. More than 30 UCR faculty members conduct research related to mammalian signal transduction and regulation of transcription. Funded by NIH.

- **Silencing RNA:** Investigations of short interfering RNA (siRNA), also known as silencing RNA, as a mechanism to regulate specific gene expression. This novel and powerful technology has potential application in the treatment of many human diseases including cancer, viral diseases such as hepatitis and HIV, macular degeneration, Huntington's disease and others. UCR faculty across four departments are actively engaged in siRNA research.

- **Chemical genomics:** Investigations of genomic responses to libraries of chemical compounds screened in high throughput assays. This powerful approach permits the dissection of processes that may be intractable using conventional genetics due to lethality or redundancy. Originally developed by UCR faculty for use in plants, this approach can be used in mammalian systems for early drug discovery and drug target identification/validation in cancer and other diseases.

- **Computational biology/modeling of complex systems:** Network modeling to address complex biological questions at the level of molecules/cells/organisms is fundamental in modern biology. Recent faculty hires with expertise in computational platforms to model biological regulatory networks and solve complex mechanistic problems related to image analysis will augment existing campus microscopy and imaging capabilities and strengthen campus expertise in this crucial area.

- **Biophysics:** This new interdepartmental/collegiate initiative is expected to bring a new cadre of graduate students to UCR to augment existing graduate programs.

- **Bioengineering:** Emerging program that focuses on development of bioengineering strategies to develop innovations in material science for therapeutic delivery and instrumentation that will aid in improved medical diagnostics.

- **Infectious Diseases:** Investigations of human pathogens and their insect vectors to help mitigate adverse microbial impacts on plant and human health. The initiative includes attention to food safety and biosecurity threats from human pathogens that may become accidental or intentional contaminants of agricultural crops.

- **Behavioral/Psychosocial Aspects of Medicine:** Studies of psychosocial factors in health and health care that affect development and progression of disease, patient-physician relationships, models for behavioral and physical interventions that can be used for optimal treatment of individual patients by health care professionals, cognitive changes in aging, eating behavior, and weight control.

- **Public Health/Health Services Administration:** Studies on women's health in international perspective, health inequalities, and interactions between concepts of health and cultural identity as it relates to cancer prevention and survivorship, and rural health and information technology.

Strengthening Health Science Research on the General Campus – Academic plans for several existing schools and colleges already call for key faculty positions that will build and enhance ongoing health sciences research at UCR. These hires will create a synergistic cluster of faculty researchers in fundamental biochemistry, structural biology, biophysics, cell biology, neuroscience, developmental biology, mammalian genomics, and computational biology – aimed at both human and model biological systems. In addition, the chancellor has earmarked 11 general campus FTEs to strengthen the base of biomedical research and facilitate the creation of synergistic faculty clusters. Current searches related to health science in the College of Natural and Agricultural Sciences (CNAS) include: infectious and vector-borne diseases, health science statistics, neuroscience, stem cell biology, biochemistry (structural biology), and public health. These areas will drive campus research in global health, basic biomedical and translational research, health care delivery, and health services research. In the Bourns College of Engineering, current and future faculty conduct research in medically relevant areas including cancer therapeutics; nanotechnology, leading to tiny devices and advanced therapies; and advanced materials, many of which are based on biologically-inspired self-assembly or have features such as self-healing.

Stimulating Economic Development and Attracting Industry Resources – An objective of the School of Medicine research enterprise is to build entrepreneurial opportunities and enhance regional economic growth. Regional economic development will be stimulated by nurturing and growing incubator companies arising from faculty research and through partnerships with external industry and pharmaceutical sponsors. Companies potentially emerging from the medical school's research enterprise have a nearby resource to establish and grow. The 39-acre University Research Park – developed through a partnership between UCR and the city and county of Riverside – is an emerging hub for technology companies in the region. Already headquarters for small businesses in biotechnology, information technology, green energy development and electronic gaming, there is ample undeveloped land remaining and potential to expand by another 17 acres. Additionally, there are plans to develop a "wet lab" business incubator where entrepreneurs can conduct proof-of-concept and prototype-development studies. Upon approval of the medical school, it is anticipated the city-university partnership will be further strengthened. Strategic partnerships with biotechnology, pharmaceutical, diagnostic, and medical device companies that are aligned with the research interests of the medical school faculty and the research mission will also be pursued.

Critical Success Factors

The research enterprise must manage the following critical success factors to achieve its goals of improving health outcomes. UCR proposes to establish and build upon research initiatives that:

- Serve the mission of the School of Medicine;
- Synergize with research clusters on the general campus;

- Provide value to the Inland Southern California region;
- Enhance the overall presence and prestige of UCR in the UC system and to external populations;
- Contribute to the scientific body of knowledge in the health sciences;
- Create opportunities for students and graduates of the medical school for investigation and research in addition to clinical medicine; and
- Aid in recruitment of successful, established senior researchers as well as young investigators who show exceptional promise.

Strategy for Research Excellence

The research enterprise will attract additional students and investors to Riverside. As a research-based, UC-quality health sciences institution, the School of Medicine will enhance the prestige and national reputation of the campus. Even before establishment of the medical school, UCR will begin building on its existing research strengths in health-related disciplines, spanning the biological and physical sciences, behavioral and social sciences, management, and engineering. In the long term, the medical school will support and promote the needs and goals of the region as well as the campus, while acting as a strong ambassador in promoting the quality and reputation of the UC system.

California already boasts a number of outstanding research-based medical schools. UCR strives to achieve this level of distinction in biomedical research through:

- Strong academic leadership;
- Recruitment and retention of top faculty, at both senior and junior levels;
- A robust portfolio of research support;
- State-of-the-art facilities and infrastructure to support research; and
- Strategic selection of research thrusts in which UCR can excel and which capitalize and build on existing strengths and regional needs.

Strong academic leadership begins with the hiring of the founding dean. He or she, in turn, will be instrumental in recruitment and retention of medical school faculty. The faculty will generate robust research support, by being competitive for contracts and grants, particularly at the federal level. Encouragement will be given for faculty to pursue multi-investigator and center grants, focused around research priorities identified for the medical school.

Potential Research Priorities

The research enterprise will seek new medical discoveries and clinical research to serve the needs of the region while training physicians along basic principles of evidence-based medical research and practice. Equally important, it will provide a critical mass of researchers to complement and augment expanding research at UCR. Themes within this research enterprise should address Inland Southern California medical needs, especially specific minority population health disparities, and emerging biomedical research priorities as defined by the NIH. These priorities include translational research, interdisciplinary research, and clinical research and training. Several potential research themes have been identified to meet these needs and align

with the 2002 Institute of Medicine recommendations in "Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care"[41] and include the following areas of research emphasis:

- ***Cardiovascular diseases*** disproportionately affects underrepresented minority populations, which are a growing demographic in Inland Southern California. Because UCR does not presently have a significant number of basic science and clinical research labs that focus on cardiovascular disease, strategic recruitment of research groups in this area could be one priority.

- A rapidly growing health concern, with disproportionate effects among African-American, Hispanic, and Native American populations, is ***insulin-resistant diabetes and metabolic syndrome.*** As with cardiovascular disease, major effort will be made to establish a significant research presence in this medically and economically important disease topic for all populations.

- ***Emerging infectious diseases*** are becoming increasingly important in developing countries and surrounding communities, including Mexico. Growth in the number of research groups addressing host defense mechanisms, immunology, infectious diseases including insect vectors and vector-borne diseases will also be strongly encouraged. Because many infectious diseases still lack effective therapies, research enterprises that focus on vaccine development would naturally complement this research area.

- ***Neurodegenerative diseases*** such as Alzheimer's and Parkinson's are already beginning to have a significant medical and economic impact on families, and this will only increase in the future. Studies on neurodegenerative processes and neuro-inflammation will be an important research focus.

- An important issue for Inland Southern California and beyond is ***Health Services Research, Public Health, and Health Care Access***. UCR already has strong programs studying various aspects of delivery of medical services in the community. These areas could be expanded to address some issues of immediate clinical concern, such as prenatal care and infant mortality among underserved populations across the nation.

Research Administration and Operations

The research enterprise will be led and supported by a senior associate dean of research, reporting directly to the dean. The senior associate dean of research will be responsible for driving the overall strategic vision of the research enterprise. Additionally, the senior associate dean will be responsible for activities that support the research enterprise, including strategic staffing, space allocation, and productivity metrics. He or she will guide the enterprise to adhere to its mission and reach strategic goals, and will foster collaborations between health sciences faculty and those on the general campus. Within the senior associate dean's organization,

[41] *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*, The National Academies Press, 2003.

support staff will ramp up to eight FTEs by 2021. Staff have been allocated for grant writing, proposal review, research facilities management, and other administrative functions.

UCR's current Office of Research will also scale in size with the addition of a medical school. Specific medical school resources will be identified within the current Office of Research to support the unique needs of the medical school. These support services include the following:

- Contract and grant administration
- Technology commercialization
- Research compliance and conflict of interest management
- Human subjects research compliance
- Animal care and bio-safety management

As the medical school matures and the research needs grow, the administrative research structure will be adapted to enhance and support the growth of the research enterprise.

Research Enterprise Assumptions and Financial Model

Operating assumptions for the research enterprise are based on current knowledge and anticipated courses of action. In staffing projections for the research enterprise, an initial assumption of a 1:1 FTE to principal investigator (PI) ratio was set, leaving room for the expected future growth of the enterprise. As grant funding and annual revenues reach expected levels, additional staffing and facilities to support that growth will be considered.

Faculty – Based on faculty funding and projected staffing models, there will be 68 FTE positions assigned as basic sciences or clinical research scientist positions. Each of these FTE positions will be allocated to fund one PI. The distribution among faculty ranks will eventually mirror the overall UC average of 50 percent professor, 20 percent associate professor, and 30 percent assistant professor.

Medical Scientists – The need for investigators who are well trained in both basic and clinical science has long been recognized within the biomedical community and is a focus of the NIH Roadmap for Medical Research.[42] As the medical school research enterprise matures, it is anticipated that research programs will include M.D./Ph.D. training tracks as well as other combined degrees to prepare medical scientists for careers that involve patient-oriented research, translational research, clinical investigation and trials, and epidemiologic studies, among others. Drawing from the anticipated diverse medical student population, these individuals would also bring new insights and approaches to health problems and could serve as a future pipeline for medical school faculty.

[42] http://nihroadmap.nih.gov/

Financial Summary

The research enterprise will be self-sustaining, meaning all annual direct operating expenses will be funded from the revenue generated by the 68 faculty FTE from grants and contracts for health sciences and clinical research initiatives, indirect cost recovery, and initial complement funding. Table 14 highlights the economics of the research enterprise.

Table 14. Economics of the Research Enterprise

Research Enterprise Fiscal Years 2008-09 to 2014-15

	Fiscal Year (in thousands)						
	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Research Enterprise							
Identified Sources of Funding							
Direct Federal and Private Research	$2,696	$3,770	$6,650	$8,220	$8,400	$10,690	$11,440
Initial Complements							
ICR Group III Allocation	$117	$164	$290	$358	$366	$466	$498
Other Initial Complement Funding	$384	$936	$260	$5,292	$3,184	$8,684	$4,652
Total Identified Sources of Funding	**$3,197**	**$4,870**	**$7,200**	**$13,870**	**$11,950**	**$19,840**	**$16,590**
Uses of Funds							
Faculty Salaries, Wages and Benefits (y-component)	$572	$797	$948	$1,572	$1,714	$2,207	$2,292
Staff Salaries, Wages and Benefits	$2,462	$3,370	$4,519	$5,423	$5,598	$6,916	$7,308
S&E Costs	$164	$703	$1,733	$6,875	$4,638	$10,717	$6,990
Total Uses of Funds	**$3,197**	**$4,870**	**$7,200**	**$13,870**	**$11,950**	**$19,840**	**$16,590**
Net Funding Excess (Deficit) for Research	$0	$0	$0	$0	$0	$0	$0

Research Enterprise Fiscal Years 2015-2016 to 2021-22

	Fiscal Year (in thousands)						
	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022
Research Enterprise							
Identified Sources of Funding							
Direct Federal and Private Research	$17,870	$19,270	$23,920	$25,270	$26,300	$27,170	$27,250
Initial Complements							
ICR Group III Allocation	$778	$839	$1,042	$1,101	$1,145	$1,183	$1,187
Other Initial Complement Funding	$18,872	$10,461	$20,358	$8,799	$8,205	$4,817	$4,813
Total Identified Sources of Funding	**$37,520**	**$30,570**	**$45,320**	**$35,170**	**$35,650**	**$33,170**	**$33,250**
Uses of Funds							
Faculty Salaries, Wages and Benefits (y-component)	$3,780	$3,941	$5,026	$5,138	$5,284	$5,333	$5,333
Staff Salaries, Wages and Benefits	$11,734	$12,495	$15,513	$16,006	$16,302	$16,571	$16,571
S&E Costs	$22,006	$14,134	$24,781	$14,026	$14,064	$11,266	$11,346
Total Uses of Funds	**$37,520**	**$30,570**	**$45,320**	**$35,170**	**$35,650**	**$33,170**	**$33,250**
Net Funding Excess (Deficit) for Research	$0	$0	$0	$0	$0	$0	$0

[1]All dollar amounts are uninflated based on '06-'07 dollar values.

Research activities will result in generation of approximately $27 million in annual direct grant and contract revenues by 2020-2021. In addition to direct revenues, indirect cost recovery (ICR) funds will be generated for the UCR campus based on application of the campus' facilities and administrative (F&A) indirect cost rate to the direct federal and private grant and contract revenues generated on an annual basis. ICR funds support infrastructure and overhead costs associated with sponsored research.

Investments in initial complements to recruit faculty will be a significant expenditure during faculty ramp-up. Initial complements will be partially funded from projected allocation of campus (ICR) funds to the medical school. The remaining investment in initial complement dollars (approximately $100 million over the 14-year projection period) will come from a combination of multiple sources of funding including development, an initial investment by the state, and an initial investment by the university.

Critical revenue funding and operating expense assumptions driving the research enterprise are summarized below.

Funding Sources:

- **Direct Federal and Private Research:** Annual direct research revenue per faculty PI based on rank: professor, $550,000; associate professor, $400,000; assistant professor, $200,000. Professors and associate professors will have fully funded grant revenues in the first year of hire. Assistant professors will require a three-year ramp-up period to achieve annual revenue levels.

- **Initial Complements:** Initial complement packages will be used to recruit basic science or clinical research faculty. Initial complement amounts based on rank are as follows: $5 million for each of four assumed research leadership positions; $2 million for professor positions; $1.2 million for associate professor positions; and $1 million for assistant professor positions. Initial complements will be funded by a combination of development funds, state start-up funds, ongoing state support funds, income from practice plans, and other sources.

- **ICR Group III Allocation:** Indirect costs are any general infrastructure support resources required to carryout extramurally funded research. Campus ICR revenues are generated by applying the campus F&A indirect cost rate to the direct federal and private grant and contract revenues generated on an annual basis. A portion of campus ICR revenues are allocated to the medical school through the group III allocation process in accordance with campus policy (Appendix F – Exhibit 3).

- **Other Sources:** Other sources may include state investment support, development funds, or other third party sources.

Uses of Funds:

- **Faculty Salaries and Benefits (y-component):** Faculty salaries and benefits assumed beyond base, or x-component, of faculty funding. This y-component of faculty salaries must be fully supported from funds available to the research enterprise (Appendix C).

- **Research Staff:** Research staff includes postdocs, graduate student assistants, research lab technicians, and other student support. Salary per FTE was determined based on current averages within UCR and/or the UC system.

- **S&E:** Direct costs of research related to supplies, equipment, services, travel, and other expenditures.

CHAPTER VII. CLINICAL ENTERPRISE

It will be crucial for the UCR School of Medicine to establish a clinical enterprise to support the distributed clinical education model. This clinical component, or "practice plan," provides venues for the training of medical students and residents, as well as settings for clinical faculty to practice medicine. From a financial standpoint, the clinical enterprise is essential so that clinical faculty can generate revenue from patient care services to support their salaries. As outlined in this chapter, at maturity the medical school clinical enterprise must generate an estimated $29.6 million per year (not adjusted for inflation) to effectively compete for clinical faculty.

In planning the medical school, UCR examined its options for developing a clinical enterprise given the requirement to utilize a distributed clinical education model and not build its own university hospital.

Several clinical models were evaluated qualitatively and quantitatively, with revenues and costs for future growth estimated and community needs considered. After this initial analysis was completed, it was determined that independent of the type of clinical model, patient care organizations are complex businesses to build and manage. They require significant investments in equipment, technology, infrastructure, skilled labor, and resources to deliver high quality care and to manage operational and business functions.

One option that was modeled early in the planning process was the purchase and/or joint ownership of a hospital. Several factors were evaluated in this high-level analysis, including sources of revenue and both operating and capital costs. A detailed analysis was not pursued because it did not fit within the UCR mission and it was too costly an endeavor.

Most importantly for the clinical enterprise, UCR is seeking a variety of collaborative partnerships with community physicians and medical groups, community clinics, and regional medical centers. This will enable the campus to train students and residents in health care settings throughout Inland Southern California, exposing them to a broad range of patients and, at the same time, resulting in greater access to services for the region's diverse and currently underserved population.

In addition to access to service offered as part of a distributed clinical model, UCR recognizes the value that clinical income brings to a medical school to support M.D. faculty. Specifically, the payment to M.D. faculty for their services is a need that was reviewed and addressed in the planning process. Revenue and cost ramifications for establishing clinical income must be considered.

To that end, UCR evaluated the following options for paying clinical faculty:

- **Option #1:** Hire on a per diem basis private practice physicians who have a split employment at both UCR and at a clinical setting
    - Within this option, UCR would pay a portion of the clinical faculty's salary for providing clinical teaching to medical students and/or residents.

- **Option #2:** Develop a network of physicians (through buying practices of retiring physicians or expanding current practices) that represents multiple specialties
    - UCR would pay the salaries for the clinical faculty, provide the salaries for the staff, and manage the overhead of the practice in exchange for the clinical revenue generated for seeing patients.

- **Option #3:** Establish a network of physicians who will be staffed on a part-time basis at clinics within the community
    - UCR would pay part of the salaries for clinical faculty and the clinics would pay part of the salaries (through the practice plan) – UCR may help with management and billing.

- **Option #4:** Establish a collaborative arrangement with local private and/or public hospitals where UCR faculty would be members of the medical center
    - UCR would pay part of the salaries for the clinical faculty and the medical center would pay part of the salaries.

The expected incremental clinical revenue derived from these options would fund the estimated $29.6 million associated with the faculty FTEs needed to cover patient clinical care and clinical teaching. A detailed estimate of revenues and expenses will be modeled for each of these options once the school is approved. Until the School of Medicine is formally approved, UCR will be unable to enter into discussions with potential community partners regarding the above options. It is anticipated the clinical enterprise will encompass a combination of the options described above.

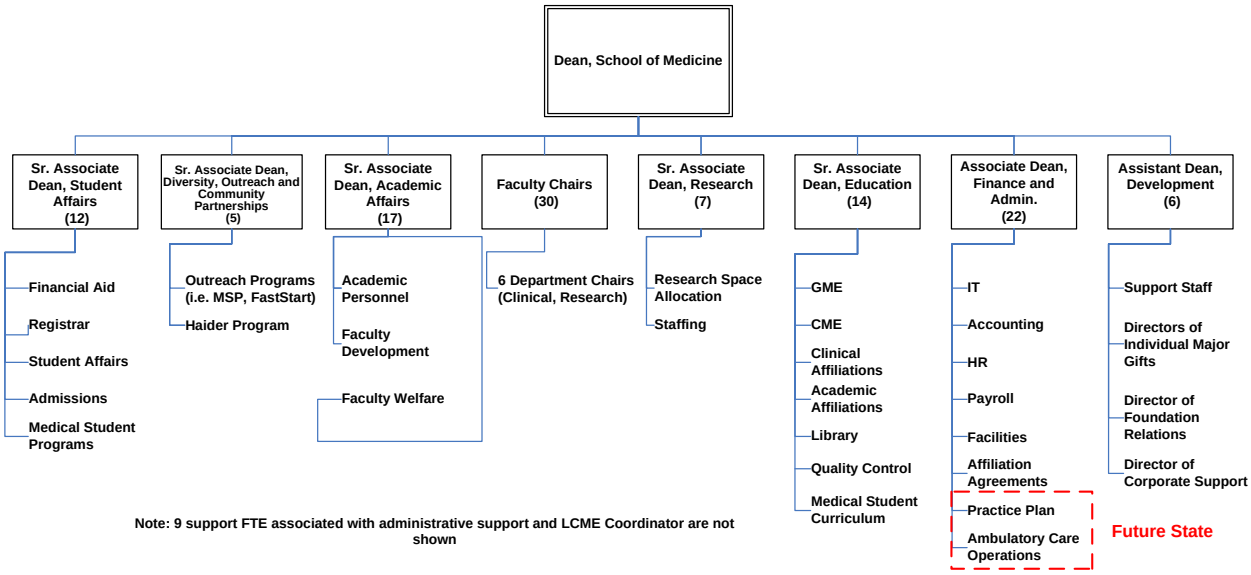
CHAPTER VIII. ADMINISTRATIVE STRUCTURE

A strong administrative support structure will be required to manage the multifaceted enterprise of a medical school. As UCR develops the medical school, significant resources and support services will be needed to accommodate the unique teaching and clinical training requirements of educating medical students. In addition to its own administrative foundation, the medical school will utilize the current support services of UCR as well as the existing infrastructure of the biomedical sciences program.

Proposed Dean's Office Structure

The dean's office will be a key component in the oversight and operation of the medical school. As shown in Figure 9, the proposed structure for the dean's office outlines the necessary functional support requirements (parenthetical numbers correspond to allocation of FTEs). The structure utilizes five senior associate deans, an associate dean, an assistant dean, and faculty chairs with distributed responsibilities. Upon the hiring of the dean, the structure and support model may be subject to change.

Figure 9. Dean's Office Organizational Chart and Functional Responsibilities at Build-Out, 2020-21[43]



The dean's offices and their respective roles and responsibilities are as follows:

- **Senior Associate Dean, Student Affairs:** The office of the senior associate dean of student affairs serves as the financial aid office, the registrar, and admissions office for medical school students. In addition, this office is responsible for providing student life services specific to medical school students and overseeing student programs.

[43] Each of these functions does not represent an FTE.

- **Senior Associate Dean, Diversity, Outreach, and Community Partnerships:** The office of the senior associate dean for diversity, outreach, and community partnerships will be critical to meeting the medical school's goals for diversity and serving the underserved populations. It will coordinate the Haider Program and other outreach programs (i.e., MSP, FastStart, Postbac). This office will also work with the senior associate dean of academic affairs for recruitment and retention of a diverse faculty. The appointee will assist with the faculty search process in various ways, including implementing a Faculty Search Committee Ambassador Program similar to the one at UC San Francisco, which assists faculty search committees to identify and attract a diverse pool of qualified candidates.

- **Senior Associate Dean, Academic Affairs:** The office of the senior associate dean of academic affairs serves the medical school's academic personnel needs by coordinating with the university in the recruitment, development, and retention of faculty. This office will ensure requirements for faculty development are met, and will coordinate all other faculty support services.

- **Senior Associate Dean, Research:** The office of the senior associate dean of research will be responsible for guiding the mission and vision for the research enterprise. The senior associate dean also will establish guidelines and oversee the process for allocating research space. This office will work closely with the current UCR Office of Research for research support needs.

- **Senior Associate Dean, Education:** The office of the senior associate dean of education will play a critical role in the areas of medical student education and GME programs. This office will manage relationships with hospitals providing clinical training, and develop and review the curriculum on a periodic basis. The senior associate dean of education will also have responsibility associated with the medical school library.

- **Associate Dean, Finance and Administration:** The office of the associate dean of finance and administration will have responsibility for accounting, human resources, facilities management, and payroll for the School of Medicine. Information technology support specific to the medical school will also be an important responsibility of this office. In the future, this office will manage the practice plan.

- **Assistant Dean, Development:** The office of the assistant dean of development will be responsible for leading the development and fundraising efforts for the medical school. This office will manage all efforts related to individual major gifts, foundation relations, and corporate support.

- **Faculty Chairs:** A faculty chair will be designated for each department, defined by research and/or clinical activity. The chair will represent his or her respective department and report directly to the dean. Five administrative staff will support each department and assume the responsibilities of management services officer, payroll transactor, contract and grant analyst, purchasing/reimbursement coordinator, and chair's assistant/general clerical support.

School of Medicine Library

The library for the UCR medical school will provide access to information and electronic resources in support of the research and educational needs of faculty and students. The medical school library will be housed in the new medical instruction and research facilities proposed for the West Campus. Responsibility for supporting the school library will reside with the university librarian, in consultation with the senior associate dean of education. Support staff will be hired as the library grows.

Annual medical school library expenses are estimated at $1.9 million at maturity. Funding will be allocated to a variety of expense items, with a specific focus on e-resources. Most of the e-resources will be contracted through the UC system, as they are today, as selected by the medical school library. Additional costs will be associated with a distributed model that will provide electronic access to e-resources for students and providers that are at locations off campus.

Administrative Structure Assumptions and Financial Model

Support Services – Between 2010 and 2022, staff in addition to those currently assigned to biomedical sciences will be hired as needed in areas such as admissions, career counseling, personnel services, information management and technology (IT), library, departmental administrative support, and others, until support FTEs reach 122 (Figure 9). This level of staff support is consistent with that of other UC medical schools. The impact on support services that will be provided by campus departments has not been specifically identified as part of this analysis. Campus services expected to be impacted by medical school operations include, but are not limited to, police, maintenance, accounting, auditing, and budgeting.

Financial Summary – Administrative and support services not directly assigned to the GME or research enterprise include salaries, benefits, and other non-salary expenses (S&E). These expenses are associated with the founding dean, appointed in fiscal year 2009-10, five senior associate deans, one associate dean (finance), and an assistant dean (development), as well as staff FTE. Table 15 summarizes the administrative and support staff costs.

Table 15. Administrative and Support Costs

	Fiscal Year (in thousands)									
	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2021-2022
Administrative and Support Services (excluding Library staff and expenses)										
Uses of Funds										
Deans Salaries, Wages and Benefits	$ -	$ 1,090	$ 1,546	$ 1,546	$ 1,825	$ 1,825	$ 2,382	$ 2,382	$ 2,382	$ 2,382
Other Staff Salaries, Wages and Benefits	$ 1,058	$ 1,223	$ 1,400	$ 2,148	$ 2,682	$ 3,187	$ 3,471	$ 4,733	$ 4,985	$ 7,005
S&E	$ 2,036	$ 2,158	$ 2,883	$ 3,960	$ 4,278	$ 5,956	$ 5,849	$ 7,461	$ 4,543	$ 5,706
Total Uses of Funds	**$ 3,093**	**$ 4,472**	**$ 5,829**	**$ 7,654**	**$ 8,785**	**$ 10,968**	**$ 11,701**	**$ 14,576**	**$ 11,910**	**$ 15,092**

[1]All dollar amounts are uninflated based on '06-'07 dollar values.

Critical assumptions driving the administrative and support structure costs are summarized below.

- **Salaries, Wages and Benefits:** Compensation amounts are assumed based on UC averages and include the following salaries per FTE amounts. [44]

    - $450,000 - $650,000 per dean
    - $235,000 per senior associate/associate dean
    - $150,000 per assistant dean
    - $49,300 average per support staff FTE

- **Supplies and Expenses (S&E):** Non-salary expenses for supplies, equipment, travel and other services determined on a per FTE basis. In addition, S&E costs include an academic and technology contingency to account for costs not specifically defined that include, but are not limited to, administrative start-up, recruitment, academic technology, and maintenance.

[44] The deans' salaries will have to be competitive to the marketplace at the time of hiring.

PART IV. FINANCIALS

The financials for the UCR School of Medicine include the operating budget, the capital plan, and the fundraising efforts necessary to support programs and facilities. In addition, the medical school will require an investment of state funds, both to assist in operations prior to the time when the school becomes self-sustaining and to provide financing for facilities necessary to support the instructional and research programs. The medical school's operating budget plan has been developed in distinct phases, each with unique circumstances and required investments, described below. A comprehensive capital and facilities plan also has been developed, including a transition plan for the current campus infrastructure and projections for new development on the West Campus. For the financial plan to be successful, a substantial development effort will be required. Goals have been established and strategies developed for a 10-year, $250 million capital campaign.

CHAPTER I. OPERATING BUDGET PLAN

The plan for the medical school's operating budget projects revenue and operating expenses for a 14-year period, from 2008-09 through 2021-22, at which point the school will become self-supporting. Prior to this point, the operating budget is shown in two phases: the start-up phase, from 2008-09 through 2011-12, prior to the enrollment of the first students, and the growth phase, from 2012-13 to 2021-22, when the school is expanding to reach maturity. All annual operating budgets projected for the school are based on uninflated 2006-07 cost values.

Required State Investment

Starting a medical school is the virtual equivalent of starting a new campus. The UCR School of Medicine will require an upfront state investment of $100 million for operations, above and beyond the enrollment-driven state revenues that have been projected. This investment will cover the gap remaining between revenues and operating expenses after the anticipated funding stream derived from fundraising efforts has been included. The shortfall is projected to be $23 million in the start-up phase; during the growth phase, the shortfall is projected to be $50 million. In addition, the $100 million state investment will provide contingency and discretionary funds necessary to hire the founding dean and initial faculty. UCR seeks this investment in the form of $15 million per year for four years, beginning 2009-10, and the remainder at $10 million per year from 2013-14 through 2016-17.

This investment will help the school to fulfill its mission and thereby provide a valuable and much-needed service to the state of California. In addition to these operating costs, the state will be asked to provide financing to develop the medical school's capital facilities, as described in Part IV, Chapter II.

Operating Budget Plan for 2020-21

By fiscal year 2020-2021, the School of Medicine will reach a self-sustaining level of breakeven operations of $87 million, not including the incremental faculty practice plan compensation of approximately $29 million. Enrollment-driven state funds will comprise 33.6 percent of total revenue, or $25 million. At this time, the school will have reached maturity, with 138 faculty FTEs, 400 medical students, 155 academic graduate students, and 160 postgraduate students.

Assuming inflation at an overall average value of 3 percent, the operating budget during these periods would grow to approximately $130 million. It is expected that state funds will be available to support its share of the projected annual budget for the medical school, based on the student and resident enrollment assumptions described in Part III, Chapter I.

Table 16 shows the projected revenues, expenditures, and fundraising goals for fiscal year 2020-21, when the school has reached maturity.

Table 16. UCR School of Medicine Projected Operating Budget Plan for 2020-21

	Fiscal Year '20-'21
MD Students	**400**
PhD Students	**155**
Interns and Residents	**160**
Total Faculty FTEs	**138**
Total Education, Research, and Administration	**489**

REVENUE FUNDING	Fiscal Year ($ in 000s) '20-'21
Enrollment Driven State Funds	$25,309
Student Fees	$7,453
Grant and Contract Revenue (Direct)	$27,170
ICR Group III Allocation	$1,183
GME Affiliation	$13,200
TOTAL REVENUES	**$74,316**
OPERATING EXPENSES	
Faculty Salaries, Wages and Benefits	$22,094
Community Based Physician Stipends	$3,412
Staff Salaries, Wages and Benefits	$27,448
Resident Salaries, Wages and Benefits	$9,646
Supplies Expense	$7,013
Facilities & Equipment Expense	$2,372
Service and Other Expense	$5,015
Financial Aid	$4,837
Academic / Technology Support	$5,665
TOTAL OPERATING EXPENSES	**$87,502**
NET FUNDING EXCESS (DEFICIT) BEFORE FUNDRAISING	**($13,186)**
Fundraising Unrestricted Gifts and Endowment Income	$16,579
ADJUSTED FUNDING EXCESS (DEFICIT)	**$3,393**
Incremental Faculty Practice Plan Compensation (Clinical Component)*	**$29,600**

* Clinical faculty will be compensated through a UCR faculty practice plan. The financial model above currently includes compensation for the component of clinical faculty FTE time (i.e., 43 clinical FTE in fiscal year 2020-21) related to their teaching responsibilities only. It is expected that there will be an additional level of compensation that will need to be generated from clinical revenues to support any y-component and/or z-component of clinical faculty compensation if compensation to faculty is distributed fully through a faculty practice plan. In fiscal year 2020-21, the amount of incremental clinical compensation is estimated to be approximately $29.6 million based on an additional 100 faculty (by headcount) related to patient clinical care, at an average salary of $250,000 per FTE, plus 18.5% for benefits. This compensation would be derived from operations of a clinical enterprise by the medical school. For more detail regarding potential options related to a clinical enterprise structures, see the Clinical Enterprise section in Part III, Chapter VII.

Approximately 71 percent of administrative, research, and support FTEs at this stage will be associated with support of academic research initiatives. Research support FTEs are calculated based on an assumed number of support positions that vary by faculty rank and type of research. On average, academic support staff FTEs equate to 5.1 for each of the 68 faculty principal investigators in the operating plan. Table 17 summarizes the administration, research, and support FTEs by type as of 2020-21.

Table 17. Administration, Research, and Support FTEs by Type as of 2020-21

Position	FTEs
Dean level leadership FTEs	8.0
Administrative and support staff FTEs	122.0
GME leadership and support FTEs	10.5
Academic research support FTE staff (post docs, graduate student researchers, lab technicians, other students)	348.6
Total Administrative, Research, and Support FTEs	**489.1**

Start-up Phase (Fiscal Years 2008-09 through 2011-12)

During the start-up phase, the UCR School of Medicine will move through a period of initial investment in preparation for its first class of medical students and residents in 2012-13. This includes the recruitment of the founding dean, establishment of the basic administrative infrastructure, recruitment of faculty, development of the research enterprise, and institution of the postgraduate training programs. Table 18 outlines the revenue and expense projections for this period.

The shortfall projected for this phase, after fundraising revenues have been realized, is $23 million. Covering this shortfall is part of the initial upfront investment required by the state of California. It will also be necessary during this period for the state to provide discretionary resources that will enable UCR to hire the founding dean and, in turn, allow the dean to hire renowned faculty, including the faculty research leaders.

It should be noted that revenues and expenditures for the research enterprise, GME affiliations, and incremental faculty practice plan compensation will essentially be break-even operations. The upfront state investment that is required for the medical school to succeed will help to fund start-up costs associated with the administrative and support infrastructure and the recruitment of the dean and founding faculty.

Table 18. UCR School of Medicine Summary of Annual Projected Operating Budget Plan for Start-Up Period, 2008-09 through 2011-12

	Fiscal Year			
	'08-'09	'09-'10	'10-'11	'11-'12
MD Students	**52**	**56**	**56**	**56**
PhD Students	**25**	**25**	**25**	**25**
Interns and Residents	**0**	**0**	**0**	**0**
Total Faculty FTEs	**14**	**17**	**19**	**27**
Total Education, Research, and Administration	**62**	**86**	**128**	**163**
	Fiscal Year ($ in 000s)			
REVENUE FUNDING	**'08-'09**	**'09-'10**	**'10-'11**	**'11-'12**
Enrollment Driven State Funds	$2,349	$2,451	$2,451	$2,451
Student Fees	$984	$1,054	$1,054	$1,054
Grant and Contract Revenue (Direct)	$2,696	$3,770	$6,650	$8,220
ICR Group III Allocation	$117	$164	$290	$358
GME Affiliation	$0	$0	$0	$0
UCOP / Campus Support for Transition Capital	$2,083	$1,145	$87	$0
UC Biomedical Sciences Program Instructional Support	$1,004	$1,004	$1,004	$1,004
TOTAL REVENUES	**$9,234**	**$9,589**	**$11,536**	**$13,087**
OPERATING EXPENSES				
Salaries, Wages and Benefits	$6,302	$9,058	$11,943	$15,677
Supplies, Equipment, Services & Other Non-Salary Expenses	$635	$1,249	$2,449	$7,844
Financial Aid	$412	$496	$562	$627
Transition Capital Spending	$2,083	$1,145	$87	$0
Academic / Technology Support	$2,394	$2,618	$3,411	$4,490
TOTAL OPERATING EXPENSES	**$11,826**	**$14,567**	**$18,452**	**$28,639**
NET FUNDING EXCESS (DEFICIT) BEFORE FUND RAISING	**($2,593)**	**($4,978)**	**($6,916)**	**($15,552)**
CUMULATIVE NET FUNDING EXCESS (DEFICIT) BEFORE FUNDRAISING	**($2,593)**	**($7,571)**	**($14,487)**	**($30,039)**
ESTIMATED IMPACT OF FUND RAISING ASSUMPTIONS				
NET FUNDING EXCESS (DEFICIT) BEFORE FUND RAISING	**($2,593)**	**($4,978)**	**($6,916)**	**($15,552)**
Fundraising Unrestricted Gifts and Endowment Income	$186	$186	$1,625	$4,897
ADJUSTED FUNDING EXCESS (DEFICIT)	**($2,407)**	**($4,792)**	**($5,291)**	**($10,655)**
CUMULATIVE ADJUSTED FUNDING EXCESS (DEFICIT)	**($2,407)**	**($7,199)**	**($12,490)**	**($23,145)**

Growth Phase (Fiscal Years 2012-13 through 2019-20)

Over this eight-year period, almost the entire enrollment plan will be achieved; however, it is necessary to hire faculty and continue the development of the instructional and program infrastructure in advance of actual growth in student enrollment. Table 19 outlines the revenue and expense projections for this period and projects an investment need of $50 million. This represents half of the upfront state investment required for establishment of the UCR School of Medicine.

At the end of this period of investment and growth, the UCR School of Medicine will have achieved enrollment maturity and will become self-sustaining. Appendix F provides supporting financial schedules and assumptions.

Table 19. Projected Operating Budget Plan for Growth Period, 2012-13 through 2019-20

	Fiscal Year							
	'12-'13	'13-'14	'14-'15	'15-'16	'16-'17	'17-'18	'18-'19	'19-'20
MD Students	78	100	200	300	350	400	400	400
PhD Students	25	33	49	70	90	110	130	145
Interns and Residents	26	60	107	128	147	160	160	160
Total Faculty FTEs	40	51	78	102	119	136	137	138
Total Education, Research, and Administration	181	216	232	346	367	447	471	483
	Fiscal Year ($ in 000s)							
REVENUE FUNDING	'12-'13	'13-'14	'14-'15	'15-'16	'16-'17	'17-'18	'18-'19	'19-'20
Enrollment Driven State Funds	$4,460	$6,548	$12,973	$18,735	$21,923	$24,948	$25,108	$25,229
Student Fees	$1,437	$1,845	$3,637	$5,445	$6,379	$7,312	$7,375	$7,422
Grant and Contract Revenue (Direct)	$8,400	$10,690	$11,440	$17,870	$19,270	$23,920	$25,270	$26,300
ICR Group III Allocation	$366	$466	$498	$778	$839	$1,042	$1,101	$1,145
GME Affiliation	$2,145	$4,950	$8,828	$10,560	$12,128	$13,200	$13,200	$13,200
UC Biomedical Sciences Program Instructional Support	$427	$0	$0	$0	$0	$0	$0	$0
TOTAL REVENUES	**$17,235**	**$24,499**	**$37,376**	**$53,389**	**$60,538**	**$70,422**	**$72,054**	**$73,296**
OPERATING EXPENSES								
Salaries, Wages and Benefits	$19,966	$25,981	$35,012	$46,606	$51,527	$59,869	$61,403	$62,366
Supplies, Equipment, Services & Other Non-Salary Expenses	$5,930	$12,187	$8,809	$24,288	$16,678	$27,676	$17,081	$17,189
Financial Aid	$898	$1,220	$2,503	$3,670	$4,253	$4,837	$4,837	$4,837
Academic / Technology Support	$4,791	$6,432	$6,293	$7,748	$4,844	$5,371	$5,485	$5,580
TOTAL OPERATING EXPENSES	**$31,585**	**$45,820**	**$52,617**	**$82,312**	**$77,302**	**$97,752**	**$88,806**	**$89,971**
NET FUNDING EXCESS (DEFICIT) BEFORE FUNDRAISING	**($14,350)**	**($21,321)**	**($15,241)**	**($28,923)**	**($16,764)**	**($27,330)**	**($16,752)**	**($16,675)**
CUMULATIVE NET FUNDING EXCESS (DEFICIT) BEFORE FUND RAISING	**($14,350)**	**($35,671)**	**($50,912)**	**($79,835)**	**($96,599)**	**($123,929)**	**($140,681)**	**($157,356)**
ESTIMATED IMPACT OF FUND RAISING ASSUMPTIONS								
NET FUNDING EXCESS (DEFICIT) BEFORE FUNDRAISING	**($14,350)**	**($21,321)**	**($15,241)**	**($28,923)**	**($16,764)**	**($27,330)**	**($16,752)**	**($16,675)**
Fundraising Unrestricted Gifts and Endowment Income	$8,235	$11,661	$15,178	$13,411	$13,934	$14,581	$15,237	$15,903
ADJUSTED FUNDING EXCESS (DEFICIT)	**($6,115)**	**($9,659)**	**($63)**	**($15,511)**	**($2,830)**	**($12,749)**	**($1,515)**	**($772)**
CUMULATIVE ADJUSTED FUNDING EXCESS (DEFICIT)	**($29,260)**	**($38,920)**	**($38,983)**	**($54,494)**	**($57,324)**	**($70,073)**	**($71,588)**	**($72,360)**

CHAPTER II. CAPITAL AND INFRASTRUCTURE

Capital improvements for the UCR School of Medicine will be realized in two phases that extend through 2015: the East Campus transition phase and the West Campus phase. The transition phase anticipates the opening of the school in 2012, which will require accommodation of an annual enrollment of 50 students per class and approximately 35 faculty on the main UCR campus. The West Campus phase develops infrastructure and constructs new health sciences instruction and research facilities on a 40-acre dedicated site west of the 215/60 freeway. This phase will accommodate full enrollment of 100 students per class and approximately 138 faculty FTE. A summary of the transition and West Campus phases is provided in Table 20.

Table 20. Capital Planning and Construction Phases

	Project Name	ASF / GSF*	Project Cost	Fund Source
Transitional Space	PRIME Telemedicine Phase I	Unknown	$1,400,000	State
	PRIME Telemedicine Phase II	3,900 asf	$3,600,000	State
	Health Sciences Surge Building and Vivarium	39,000 / 61,000	$40,000,000	Campus
	Anatomy Lab Renovation	2,200 asf	$2,500,000	UCOP/ Campus
	Biomedical Sciences Space Renovations Step 1	4,000 asf	$255,000	UCOP / Campus
	Biomedical Sciences Space Renovations Step 2	1,900 asf	$448,000	UCOP / Campus
	Biomedical Sciences Space Renovations Step 3	1,500 asf	$190,000	UCOP / Campus
	TOTAL	**--**	**$48,393,000**	--
West Campus	Infrastructure	--	$42,000,000	State
	Medical Instruction and Research Facilities I & II	282,875 / 450,731	$421,500,000	State / Other
	Vivarium Facility	22,060 / 40,100	$44,400,000	State / Other
	TOTAL	**--**	**$507,900,000**	--

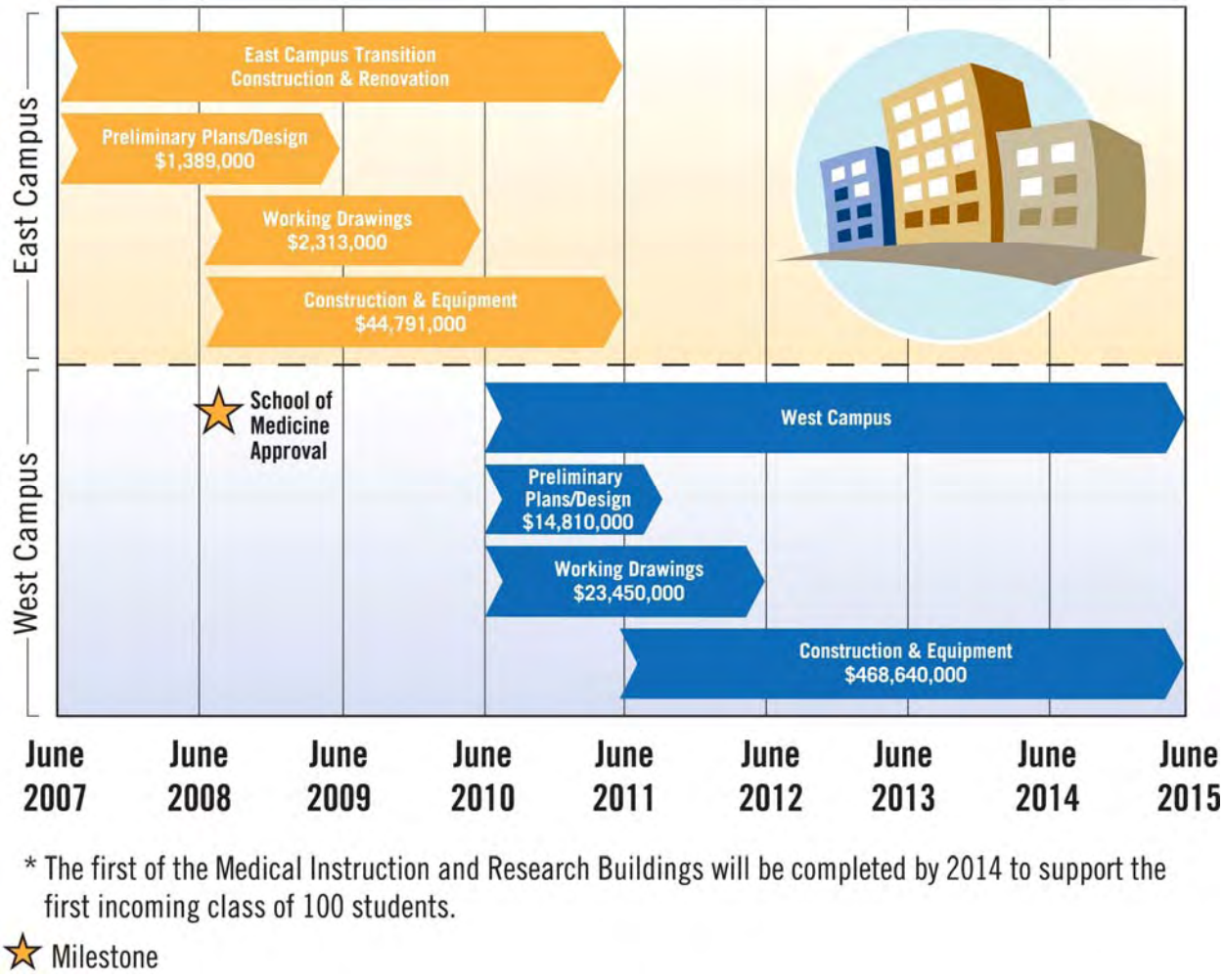
[1]*ASF = assignable square feet; GSF = gross square feet

As shown in this table, the development of capital facilities for the UCR School of Medicine will require the state of California to provide financing for a major portion of the capital budget.

UCR's 2005 Long Range Development Plan identifies areas of the West Campus for future development of graduate and professional programs, including a 40-acre reserve now envisioned for the medical school. Third party planning and architectural consultants have been engaged to test the physical feasibility of the site in supporting the proposed development for the school. The consultants also assisted UCR in formulating conceptual program requirements for the initial West Campus development, and identified associated construction costs. UCR campus site diagrams, including the proposed medical school development on the West Campus, can be found in Appendix G – Exhibits 1-3.

Figure 10 shows the estimated timeline for capital planning and construction, with the East Campus transition phase ranging from 2007 to 2011, one year prior to the opening of the medical school, and the West Campus phase extending from 2010 to 2015, when growth in student enrollment and faculty numbers can no longer be accommodated in the main campus facilities. The initial medical instruction and research facilities will be completed by 2014 to support the first incoming class of 100 students.

Figure 10. Capital Planning and Construction Timeline



* The first of the Medical Instruction and Research Buildings will be completed by 2014 to support the first incoming class of 100 students.

☆ Milestone

East Campus Transition Phase

Development of the East Campus transition phase will occur through 2011. Transition plans call for equipping and renovating current Biomedical Sciences instructional and office space, as well as constructing a new health sciences surge building and enhancing vivarium space on the main campus. Phased renovations will be completed during 2008 and summer 2009. Construction for the new facilities is scheduled to begin in 2009. The combined renovated and new space will be sufficient to accommodate up to 50 students per class and the initial medical school faculty

required to deliver the curriculum. This phase handles capacity for the school until the initial phase of West Campus development is ready for occupancy. For a detailed description of each project in the East Campus transition phase (Appendix G – Exhibit 4).

As shown in Table 21, total capital costs for the East Campus transition phase are approximately $48 million, uninflated and in 2006-07 dollars. Most of the funding for the transition phase will go toward the health sciences surge building and vivarium. Potential sources of funding for these projects can be found in Table 20. The conceptual design and construction timeline for these facilities is diagrammed in Appendix G – Exhibit 5.

Table 21. East Campus Transition Phase Project Costs (2007 - 2011)

Project	Total Project Cost
PRIME Telemedicine Phase I	$1,400,000
PRIME Telemedicine Phase II	$3,600,000
Health Sciences Surge Building and Vivarium	$40,000,000
Anatomy Lab Renovation	$2,500,000
Biomedical Sciences Space Renovations Step I	$255,000
Biomedical Sciences Space Renovations Step 2	$448,000
Biomedical Sciences Space Renovations Step 3	$190,000
Total Cost	**$48,393,000**

West Campus Phase

The West Campus has been identified as the location for future facilities to accommodate the UCR School of Medicine. This phase includes infrastructure development as well as new construction. Because the site is currently undeveloped, infrastructure requirements include installment of site utilities and connections to municipal services, a central plant, roadways, hardscape, and landscape. New facilities include two new medical instruction and research buildings and a new vivarium facility. The initial building will be completed by 2014 to support the first incoming class of 100 students. Together the two buildings will support projected enrollment and faculty growth through 2021 and beyond. Construction of the West Campus facilities is scheduled to begin in 2010, with occupancy in 2015.

A detailed description of each project in the West Campus phase may be found in Appendix G – Exhibit 4.

As shown in Table 22, the West Campus phase is projected to cost approximately $508 million, uninflated and in 2006-07 dollars. Potential sources of funding for these projects are identified in Table 20. The conceptual design and construction timeline for these facilities is diagrammed in Appendix G – Exhibit 5.

Table 22. West Campus Phase Project Costs (2010 – 2015)

Project	Total Project Cost
Infrastructure	$42,000,000
Medical Instruction and Research Facilities	$421,500,000
Vivarium Facility	$44,400,000
Total Cost	**$507,900,000**

Both significant renovations and new construction are required between now and the projected opening of the medical school to accommodate anticipated enrollment, faculty, and staff. Space needs have been identified, and initial steps are already being taken to renovate existing facilities and construct new ones. The physical capacity of the West Campus site has been tested, and development costs identified. This site will support initial construction for the medical school, as well as longer-term program and facilities needs.

In addition to already identified funding sources for the transition and West Campus phases, the campus continues to evaluate other capital funding strategies. As stated previously, the UCR School of Medicine will depend on the state of California to provide financing for a significant portion of the total capital expenses.

CHAPTER III. DEVELOPMENT AND FUNDRAISING

Fundraising comprises a significant component of the financial model for the UCR School of Medicine. Funds generated through development efforts will supplement but not supplant the operating and capital support for the school from the state of California. Success in fundraising requires Regental approval for establishment of the medical school, commitments by the University of California and the state for financial support for the school, and appointment of a UCR chancellor and a founding dean.

UCR will mount a 10-year capital campaign with a target of $250 million to generate needed support for the medical school. Preliminary planning for the campaign has already begun; this will accelerate once Regental approval for the school has been obtained. A comprehensive feasibility study will be initiated subsequent to formal approval, which may result in an adjustment of campaign goals. The start of the quiet phase of the campaign will depend in part on the timing and expectations of the founding dean.

The proposed fundraising campaign will require the dedicated time of the chancellor, vice chancellor for university advancement, and especially the medical school dean, who will provide leadership to the effort. Within the dean's office, development and fundraising responsibilities will fall under the assistant dean of development, who will be responsible for all medical school-related campaign planning, execution, and evaluation in addition to relationship cultivation and solicitation.

Assumptions

Fundraising is projected to develop a stream of funds that will supplement the operating and capital support that will be required from the state. Assumed funds include the income on endowment earnings and unrestricted gifts that will be available for the general operations.

To develop assumptions, a careful analysis was conducted of development activities for public medical schools that do not own hospitals (five that were given particular attention are Texas A&M Health Center – College of Medicine, Northeast Ohio Universities College of Medicine, University of Washington College of Medicine, Wayne State University School of Medicine, and Eastern Virginia Medical School). The mean for private support raised each year was about $20 million. With a focused campaign and the impetus of a new medical school, UCR has set its annual target at an average of $25 million per year. While the precise amount of funds raised is expected to fluctuate on an annual basis (in fact, at key milestones such as the opening of the medical school, the amount of private support is expected to surge), an average of $25 million is considered realistic and has been used for modeling purposes.

In the financial models presented, the projected fundraising amounts are shown as a reduction in total medical school investments required. Specific operating assumptions related to fundraising, gifts, and endowments include the following:

- The school will receive $25 million in gift and endowment pledges per year beginning in 2009-2010, amortized to cash over a five-year period.
- Investment earnings on endowment balances accruing to the school are five percent.

Based on benchmarks from these comparable schools, UCR can expect to target ongoing annual support beyond a capital campaign at the following levels: 62 percent for current operations, 18 percent in endowments, 13 percent in capital gifts, and 7 percent other designations. The analysis also showed that the types of donors are likely to break down as follows:

- Private foundations – 27 percent
- Individuals – 24 percent
- Corporations – 16 percent
- Other institutions – 13 percent
- Personal/family foundations – 12 percent
- Alumni – 4 percent
- Medical school alumni – 3 percent
- Medical school faculty/staff – 1 percent

Fundraising Efforts to Date

Currently UCR has three full-time individuals assigned to raise funds for the medical school. In addition, the interim vice chancellor for advancement devotes a significant portion of her time to the school. To date, their efforts have yielded approximately $30 million in gifts and endowments. Among the significant gifts/pledges made so far are the following:

Gifts:

- $8.5 million planned gift for endowed chairs
- $5 million pledge from United Healthcare for planning
- $3.5 million to endow the dean's chair
- $3 million for three endowed chairs
- $1 million for endowed chair in cancer research

Programs and Grants:

- $1.6 million from Howard Hughes Medical Institute for FastStart and Medical Scholars
- $496,400 from California Endowment
- $300,000 from Charles Dana Foundation
- $244,000 from California Wellness
- $100,000 from Nathan and Violet David Foundation for Medical Scholars

This success is significant because the medical school has not yet received Regental approval. Once the school is formally approved, fundraising efforts—and successes—are expected to accelerate dramatically. UCR has a young and growing development program, which has recently begun to receive recognition. In 2007, the campus received a national award from the

Council for Advancement in Support of Education for overall improvement, in recognition of UCR's exceptional fundraising improvement over the past three years.

Other recent highlights for UCR Development include the following:

- The UC Riverside Foundation endowment fund continues to grow, nearly doubling during the last five years due to new gifts and strategic investment strategy.
- Alumni giving and participation by undergraduate alumni has increased steadily as this relatively young alumni base finds itself in a financial position to give back.
- The number of individual donors has increased, which bodes well for future major and planned gifts.
- In 2006 UCR received its largest planned gift to date, $15.5 million, from one of its alumni. Ultimately this gift will endow chairs in several of the university's colleges and schools, including the medical school.

School of Medicine Capital Campaign

Upon Regental approval, and with the hiring of the founding dean, UCR will undertake a comprehensive feasibility study that will help frame the proposed capital campaign. Table 23 shows critical elements of the planning, quiet, and public phases of the campaign.

Table 23. Fundraising Campaign Overview

Campaign Planning Phase	Campaign Quiet Phase	Campaign Public Phase
• Finalize institution's strategic plan • Develop internal operations plan • Determine campaign budget and resources • Complete feasibility interviews • Set up campaign calendar • Adopt campaign policies & procedures • Formulate preliminary campaign case statement and campaign theme • Develop plan for involving alumni & volunteers • Develop communication plan • Develop & recruit for campaign positions • Educate staff and leadership • Intensify prospect research & determine capacity • Hold prospect management meetings • Develop plan for campaign events	• Confirm project plans, financial projections, project phases & goals • Refine campaign strategies, organization, plans and timelines • Establish campaign meeting schedules • Build the individual prospect pool for leadership gifts & assign to solicitors • Solicit trustees, steering committee members and other leadership • Build prospect pool for foundations & corporations and solicit per timetable • Gather information from campaign leaders about contacts • Close gifts to reach 50% of campaign goal • Continue building major gift prospect list • Continue distribution of campaign information • Report ongoing progress to all constituencies	• Stage a public kick-off extravaganza • Intensify publicity and communications • Solicit major gifts • Increase prospect pool for major gifts • Conduct stewardship for early leadership donors • Recruit and train a large pool of volunteers • Hold social and informative cultivation events for donors • Broaden base of lower-level support through direct mail and telemarketing • Complete final campaign thrust • Plan and stage a victory celebration • Thank and honor campaign leaders, volunteers and donors • Host a new building dedication • Communicate by mail with all campaign donors

In the early years, investment in development will increase significantly. Including the assistant dean, seven FTEs are planned for the medical school development/fundraising function. These include a director of corporate support, director of foundation relations, two directors of individual major gifts, and two support staff. As indicated, the dean will be the single most important force in the success of the campaign; he or she will be expected to devote a significant amount of time to this effort.

The capital campaign will have a major impact on shaping the medical school. Endowed chairs will provide important tools for recruiting and retaining faculty into prestigious positions. Scholarships will provide support to students, particularly those who are economically disadvantaged. Research support is likely to come in the form of individual donations targeted toward specific diseases. Finally, over time, naming opportunities for major buildings and other facilities are expected to generate significant gifts.

Fundraising Potential of Inland Southern California

UCR has been an integral part of Inland Southern California for more than fifty years. As the only comprehensive doctoral research university in the region, its influence is significant and growing. Recently UCR opened a satellite campus in Palm Desert, expanding UCR's service to the Coachella Valley. Already, UCR has a strong presence in the Temecula and Fontana areas, through University Extension. The campus enjoys especially strong community relations.

Despite this, UCR's full fundraising potential has not yet been tapped. A wide variety of corporations and foundations with potential interest in supporting UCR's medical school has been identified. Prospects include the following industry sectors: health care products, biotechnology, pharmaceuticals, health care services, insurance, health care staffing and management. A number of foundations has been identified with interests in research and/or health care delivery for specific diseases, health education, capital projects, and public health. Naming opportunities exist for buildings, endowed chairs, scholarships, programs, and the school as a whole. In addition, the unique mission of the UCR School of Medicine should greatly encourage community interest and fundraising opportunities.

UCR recently completed its first-ever capital campaign targeted at $50 million; a total of $50.9 million was raised from 10,190 donors, nearly half of them first-time givers to the campus, and the campaign finished eight months ahead of schedule. Total private support (gifts and pledges) increased by 74 percent over last fiscal year.

With that said, UCR's fundraising goals will be a challenge. Inland Southern California does not enjoy a great deal of wealth, nor does it house high tech industry to the degree seen in the Bay Area or San Diego, for example. The medical school campaign will be national and even international in scope, however, and will focus on whole groups of individuals, organizations, corporations, and foundations not previously approached by UCR. For UCR to achieve the ambitious targets outlined in this proposal will require a concerted, well-planned and organized effort and a major commitment of time from a team that includes the chancellor, vice chancellor for university advancement, and founding dean and his or her staff.

CHAPTER IV. FINANCIAL MODELING ASSUMPTIONS

Enrollment

Operating expense and resource requirements and the related projected funding are largely driven by student enrollment projections for the medical school. Enrollment projections are tied directly to the space availability for both students and faculty on the UCR campus. The initial two years of the school will be housed in renovated transition space on the East Campus. UCR's ability to support the four-year program and increase enrollment of medical students to 400 and academic graduate students to 160 is largely dependent upon completion of the medical education and research facilities on the West Campus prior to academic year 2015-16.

The assumptions for student enrollment by level and degree objective are as follows:

- **Medical Students:** A four-year M.D. degree based on a curriculum that supports didactic, problem-based learning, and clinical clerkships to provide a broad based training environment for the medical students. The curriculum in the first and second years is heavily influenced by the current two-year UCR/UCLA program. Medical student enrollment is limited to 50 students in the first two years in transition space, growing to 100 students per year upon movement to permanent facilities on the West Campus in 2014-15.

- **Academic Graduate (Ph.D.) Students:** Currently, UCR has approximately 20 Ph.D. students working with Biomedical Sciences faculty as their primary advisors. The overall doctoral enrollment within the medical school is projected to increase to 160 by 2021-22 in order to support the vision of the school as a research-driven school of medicine.

- **Interns and Residents:** The UCR medical school also will support an active graduate medical education (GME) program that will operate primarily within the communities of Inland Southern California. This program is a critical academic initiative to advance the education of doctors beyond the four years of the M.D. degree within Inland Southern California. The intern and resident program is a critical component for supporting the rotations and education of the third and fourth year medical students. The total number of intern and residents is projected to increase from 26 in 2012-13 to 160 by 2017-18 and thereafter. While current projections assume no growth beyond 160 interns and residents, it is reasonable to expect that the GME program will grow in a cost neutral manner to a significantly larger size in future years to meet the needs of Inland Southern California.

Staffing Resource Requirements

Resources identified are included into the following two categories: Faculty (state-supported faculty FTEs) and non-salary expenses needed to support the faculty. Assumptions for each are described below.

Faculty – Total state-funded (budgeted) faculty FTEs equal 138 by 2019-20, when full enrollment of students, interns, and residents occurs. State-funded faculty FTEs are calculated using existing student-to-faculty funding ratios, which are then applied to the proposed student enrollment numbers by degree objective. The ratios used for the calculation of state-funded faculty FTEs are those consistently applied at other UC schools of medicine, and they reflect the standards for accredited schools. These FTEs are for full-time faculty who will provide research, teaching, and administrative functions. The student-to-faculty ratios assumed include the following:

- 3.5:1 for M.D. students (i.e., one faculty FTE state-funded for every 3.5 medical students)
- 18.7:1 for Ph.D. students
- 10:1 for Interns and Residents

Funding generated by these ratios will be necessary to compensate positions that include ladder-rank faculty, basic science and clinical research scientists, clinical education faculty who are not on a tenure track, and community education physicians who supplement clinical education teaching requirements. The latter group of physicians falls into the community faculty category—non-ladder rank adjunct faculty who are reimbursed based on a negotiated stipend.

Staff – Non-faculty staff positions are based upon national and UC specific staffing level indicators, and are sufficient in number to support the faculty in the accomplishment of the school's mission. These include staff in the grant funded research program, including such positions as postdoctoral scholars, lab technicians, non-faculty academic researchers, and other necessary support staff. Also included are staff in the dean's office, supporting such functions as admissions, recruitment, fiscal management, graduate medical education, information management and technology, human resources, research administration, and other critical support services. Other staff positions are in the medical school library, supporting the provision of information and resource access.

Non–Salary Expenses – Non-salary operating expenses are calculated primarily on assumptions that include estimated FTEs (faculty and staff) and student enrollment. Specific types of non-salary expenses include:

- **Employee benefits:** Based on a percentage of salary cost based on level of staff.

- **Supplies, equipment, facilities, services and other costs (S&E expenses):** Direct costs for academic and research initiatives. Amounts projected are based on UCR historical experience and a comparison to other UC medical school operations.

- **Library Cost (non-salary):** Direct costs to support e-resources and print requirements for the school and the expanded community-based teaching programs.

- **Financial Aid:** Significant growth in financial aid is a critical objective of UCR's goal for ensuring a diverse student body in the medical school. Projection assumes increasing the level of financial aid three-fold, to a level equating to 50 percent of total student fees.

- **Initial Complement (recruiting) packages for research faculty FTE positions.**

Revenue Funding

Revenue to cover operating expenses of the medical school will come primarily from five currently identifiable sources:

- **State Funds:** Annual amounts to be received for each medical student, Ph.D. student, and GME intern and resident, based on the following existing state formulas:
  - $50,266 per medical student
  - $8,036 per Ph.D. student
  - $27,008 per resident

- **Student Fees:** Professional and education fee per medical student, and medical school allocated portion of education fees for medical and Ph.D. students. Based on current UC fee structure.

  - $14,004 Professional fee per medical student
  - $3,417 Education fee per medical student
  - $3,126 Education fee per Ph.D student

- **Federal and Private Research Grant Funding:** Direct amounts for NIH and other federal and private grant funding generated on a faculty/PI basis, depending on faculty rank. Indirect cost recovery (ICR) amounts to be received by UCR are not included except for an amount based on historical Group III allocations.

- **Intern and Resident Affiliation Payment:** Estimate of $82,500 to be received from hospitals affiliated with UCR's GME program. Amounts are assumed on a per resident basis and represent payments to UCR to support value of the GME program to the hospital provider.

- **Fundraising, restricted gifts and endowments, and other development funds:** Aggressive efforts to obtain funding from extramural sources, including foundations and other philanthropic organizations, are expected to generate an average of $25 million per year beginning in 2009-10; this is assumed to be allocated between endowment funds and unrestricted gifts.

The projected operating budget revenue and expenditure details by year for the UCR medical school are summarized in Appendix F – Exhibits 1-2.

PART V. CRITICAL MILESTONES AND FACTORS FOR SUCCESS

A number of critical milestones and factors for success lie ahead for the UCR School of Medicine. Each of the following must be addressed in the planning or implementation phases for the school to be financially viable and meet its projected timeline.

- **State Investment** – An upfront state investment in the medical school is essential. Just as when a new campus is built, funding must be made available to develop the school's infrastructure in advance of the state resources that will be driven by enrollment. This upfront investment is projected to be $100 million.

- **Recruitment of Dean** – Recruitment of a prominent dean dedicated to the mission is critical to the success of the school. The dean will help attract top faculty and provide leadership to the school's teaching, research, and service programs. With an experienced development staff, the dean will build relationships to meet the medical school's development targets.

- **Capital Facilities** – Enrollment and faculty recruitment projections are based on the successful completion and timely construction of facilities on the West Campus. Any setback will delay the growth of enrollment, and hence hiring, as transition facilities will not support class sizes beyond 50 students. As the school matures beyond the horizon projected in this proposal, additional research and teaching space will be considered.

- **Affiliations and Partnerships** – The success of UCR's distributed clinical model will depend on the establishment of mutually beneficial relationships with regional hospitals and clinics that align with the medical school mission of serving the medically underserved. These affiliations and partnerships will be critical to offering students a broad range of experiences in the diverse and growing region.

- **Faculty Recruitment** – Building the research enterprise requires the attraction of acclaimed talent from multiple research disciplines. Doing so will require the focused attention of the dean and adequate resources for him or her to offer competitive recruiting packages (initial complements).

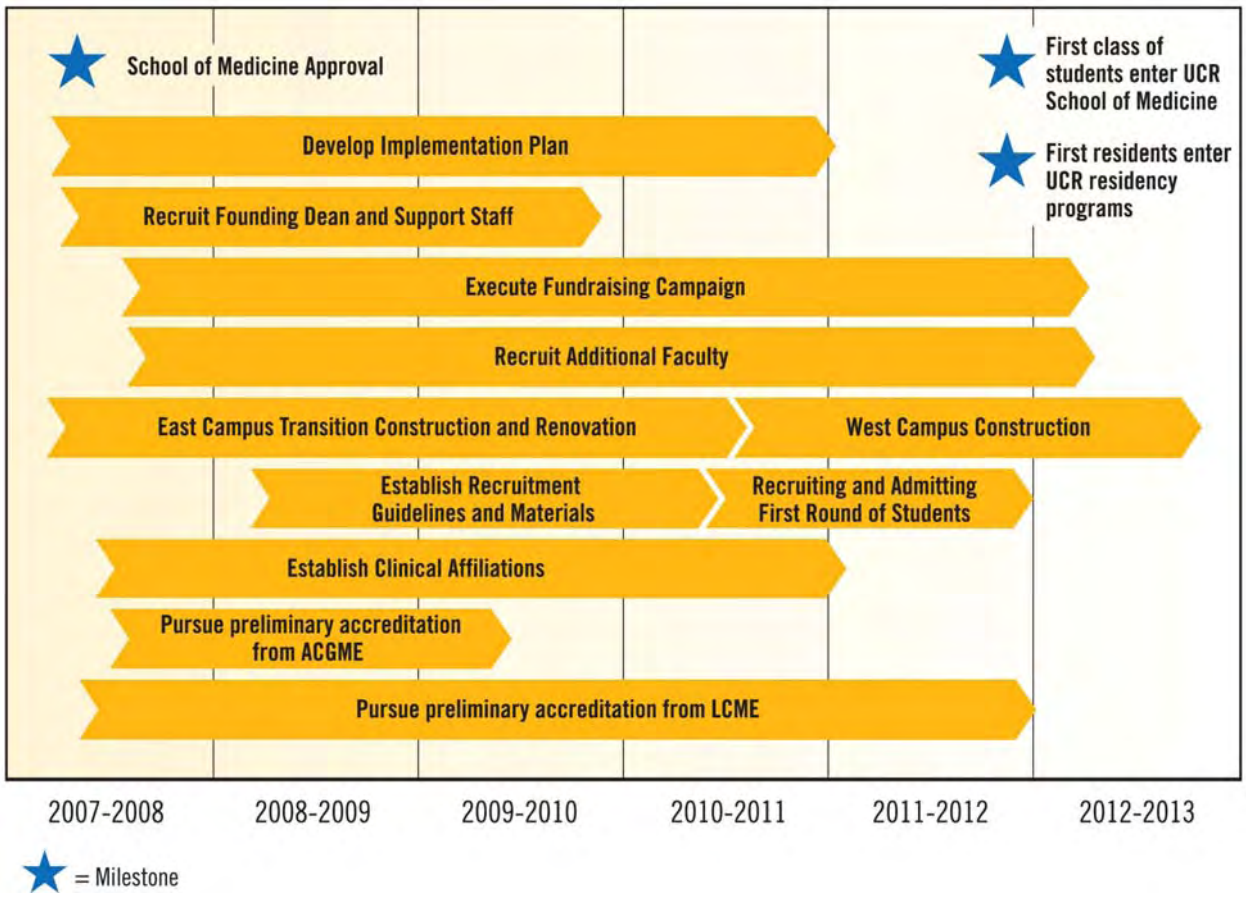
- **Leveraging Resources** – A critical success factor will be UCR's ability to leverage its state, community, alumni, and economic relationships to raise the initial funds necessary to launch a successful medical school and to conduct continuing development efforts that will support the ongoing enterprise.

- **Implementation Plan** – Subsequent to the final approval of the UCR School of Medicine, the campus will need to undertake an extensive plan for implementation. This will require the active involvement of all stakeholders – UCR faculty, administration, and staff as well as community partners.

- **Accreditation** – The UCR School of Medicine will require accreditation by the Liaison Committee on Medical Education (LCME), Accreditation Council for Graduate Medical Education (ACGME), and Residency Review Committee (RRC). Application processes are expected to begin in 2009.

The major milestones for the UCR School of Medicine are illustrated in Figure 11.

Figure 11. School of Medicine Key Milestones



Planning for the UCR School of Medicine has been underway for some time. Development of this proposal involved an extensive, highly consultative process involving UCR faculty, staff, and administration; the UC Office of the President; representatives from regional hospitals and clinics and other health care providers; and the community. Throughout the planning process, the campus has been guided by a distinguished External Advisory Board, made up of deans, former deans, and other experts representing UC San Francisco, Harvard Medical School, University of Minnesota, Duke University, UCLA, and the Association of American Medical Colleges. The curriculum has been endorsed by deans of the existing UC medical schools. (See Appendix H.) In addition, the school has generated more than 50 resolutions and letters of support from local businesses, community groups, and government. These may be found at: http://www.medschool.ucr.edu/endorse.html.

For the UCR School of Medicine to become a reality, approvals are required from the Riverside Division of the Academic Senate, the University of California Academic Council, the UC Office of the President, and the UC Board of Regents. In addition, this proposal will be reviewed by the California Postsecondary Education Commission, whose recommendation will be considered by the state Department of Finance, the legislature, and the Governor.

The University of California, Riverside has developed a compelling case for establishment of the next school of medicine in California, based on the enormous state and regional need and the school's mission of training a diverse workforce of physicians and developing innovative research and health care delivery programs that will improve the health of the medically underserved in the region and become models to be emulated throughout the state and nation.

PART VI. APPENDICES

Appendix A. Governing and Accrediting Bodies

Appendix B. Acknowledgements

Appendix C. Health Sciences Compensation Plan

Appendix D. Proposed School of Medicine Curriculum

Appendix E. Postgraduate Training Programs

Appendix F. Supporting Financial Schedules and Assumptions

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APPENDIX A. GOVERNING AND ACCREDITING BODIES

Liaison Committee on Medical Education (LCME)[45]

The LCME is the accrediting body for medical education programs in the United States and Canada. The LCME accredits only allopathic medical schools; osteopathic medical schools are accredited by the American Osteopathic Association (AOA). Each of the 126 U.S. and 17 Canadian allopathic medical schools accredited by the LCME must submit to a comprehensive review every seven years, which includes a site visit. Application for provisional LCME accreditation needs to occur three years prior to matriculation of the first medical student class.

Accreditation Council for Graduate Medical Education (ACGME)[46]

The Accreditation Council for Graduate Medical Education is a private, non-profit council that evaluates and accredits medical postgraduate programs in the United States. The mission of the ACGME is to improve health care by assessing and advancing the quality of postgraduate physicians' education through accreditation.

Residency Review Committees (RRC)[47]

Comprised of experts in their respective medical specialites, there are 26 specialty-specific Residency Review Committees and one Transitional Year Review Committee under the auspices of the ACGME. These RRCs are responsible for the periodic revision of accreditation standards and the regular review of accredited programs against those standards.

Association of American Medical Colleges (AAMC)[48]

Founded in 1876, the AAMC is a not-for-profit organization representing all 126 accredited U.S. and 17 accredited Canadian medical schools. In total, nearly 400 major teaching hospitals and health systems are represented by the AAMC. The AAMC and the medical schools, teaching hospitals, academic and professional societies, faculty, residents, and students are committed to improving the nation's health through medical education, research, and high-quality patient care.

[45] Source: LCME, The LCME at a Glance. http://www.amsa.org/tnp/articles/article.cfx?id=308
[46] Source: ACGME, The ACGME at a Glance. http://www.acgme.org/acWebsite/newsRoom/newsRm_acGlance.asp
[47] Source: ACGME, http://www.acgme.org/acWebsite/fieldStaff/fs_siteRole.asp
[48] Source: AAMC, The AAMC at a Glance. http://www.aamc.org/about/ataglance.htm

APPENDIX B. ACKNOWLEDGEMENTS

This proposal to establish a four-year medical school at UC Riverside was made possible by the expertise, advice and guidance of many dozens of individuals who served on planning work groups and advisory boards. The University of California, Riverside would like to thank the following individuals for their contributions of wisdom and time in conceiving and strengthening this proposal.

Chancellor's Blue Ribbon Committee

Charles E. Young, *Chair*
Past President, University of Florida; Chancellor Emeritus, UCLA

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Chancellor, UCSF; Nobel Laureate

Thomas Cesario, M.D.
Former Dean, School of Medicine and College of Health Sciences, UC Irvine
Professor Emeritus, Department of Medicine, UC Irvine

Haile T. Debas, M.D.
Executive Director, Global Health Sciences, UCSF; Chancellor Emeritus, UCSF; Former Dean, UCSF

S. Sue Johnson
Former Chair, UC Board of Regents

Gerald S. Levey, M.D.
Vice Chancellor and Dean, UCLA School of Medicine

William Peck, M.D.
Director of the Center for Health Policy, Washington University in St. Louis; Former Dean of the School of Medicine, Washington University in St. Louis

UCR Health Sciences Initiative Advisory Panel ("Peck Panel")

William Peck, M.D., *Chair*
Director of the Center for Health Policy, Washington University in St. Louis; Former Dean of the School of Medicine, Washington University in St. Louis

Robert D'Alessandri, M.D.
Founding Dean, Medical College of Northeast Pennsylvania; Former Vice President for Health Sciences at West Virginia; Former President, Blanchette Rockefeller Neurosciences Institute

Eugene A. Bauer, M.D.
Chief Executive Officer, Neosil Incorporated; Former Vice President and Dean, Stanford University Medical Center

Michael Drake, M.D.
Chancellor, UC Irvine; Former Vice President for Health Affairs, University of California Office of the President

Robert D. Grey
Acting Chancellor, UC Riverside; Provost and Executive Vice Chancellor Emeritus, UC Davis

Lois Margaret Nora, M.D., J.D.
President and Dean, Northeastern Ohio Universities College of Medicine

Joseph Silva, M.D.
Dean Emeritus, UC Davis School of Medicine

External Advisory Board

Haile T. Debas, M.D., *Chair*
Executive Director, UCSF Global Health Sciences; Former Dean and former Chancellor, UCSF

David Hayes-Bautista
Professor of Medicine and Director, Center for the Study of Latino Health and Culture, David Geffen School of Medicine, UCLA

Jordan J. Cohen, M.D.
Professor of Medicine and Public Health, George Washington University; Former President, Association of American Medical Colleges; former Dean, SUNY Stony Brook School of Medicine

Joseph Martin, M.D.
Former Dean of Faculty of Medicine, Harvard Medical School; former Dean and Chancellor, UCSF

Neil Parker, M.D.
Senior Associate Dean, David Geffen School of Medicine, UCLA

Deborah Powell, M.D.
Dean of the Medical School and Assistant Vice President for Clinical Sciences, University of Minnesota

Ralph Snyderman, M.D.
Chancellor Emeritus for Health Affairs, Duke University; President and CEO, Duke University Health System

Work Group Participants

Administration, Finance & Student Affairs:

Neal Schiller, *Chair*
Reza Abbaschian
Georgianne Carlson
Stephen Cullenberg
Al Diaz
Susan Harlow
Tony Norman
Matt Hull
Neil Parker
Chuck Rowley
Jim Sandoval
Phyllis Guze, M.D., *ex-officio*
Richard Luben, *ex-officio*

Capital Planning & Facilities:

Richard Luben, *Chair*
Tim Ralston, *Co-Chair*
Peter Atkinson
Monica Carson
Mark Denton
Al Diaz
Laurie Owen
Rick Redak
Stewart Shankel, M.D.
Kambiz Vafai
Neal Schiller, *ex-officio*
Phyllis Guze, M.D., *ex-officio*

Research Enterprise:

Jerry Schultz, *Chair*
David Lo, *Co-Chair*
Mike Adams
Peter Atkinson
Anil Deolalikar
Howard Friedman
Russ Hille
Charles Louis
Chris Lytle
Tina Nova
Laurie Owen
Michael Pirrung
AJ Rogers, M.D.
Mike Roose
James Willette
Craig Byus, *ex-officio*
Phyllis Guze, M.D., *ex-officio*

Academics:

Craig Byus, *Chair*
Steve Bossert
Rich Cardullo
David Lo
Betty Lord
Ameae Walker
LuAnn Wilkerson
Jerry Schultz, *ex-officio*
Phyllis Guze, M.D., *ex-officio*

Clinical & Clerkships:

Stewart Shankel, M.D., *Chair*
Emily Ebert, M. D.
Eric Frykman, M.D.
Neal Halfon, M.D.
John Heydt, M.D.
Jodie Holt
Jonathan W. Horstmann, M.D.
Steve Larson, M.D.
Juliet McMullin
Kathleen Montgomery
Kiki Nocella
Manuela Sosa, D.D.S.
Cliff Trafzer
Takashi Wada, M.D.
Phyllis Guze, M.D., *ex-officio*

GME & Affiliations:

Dallas Rabenstein, *Chair*
Kiki Nocella, *Co-Chair*
Wendy Ashmore
Craig Byus
Larry Loo
Walter Morgan, M.D.,
Richard Rajaratnam, M.D.
Aubrey Serfling
Tom Sibert, M.D.
Don Siegel, , M.D.
Phyllis Guze, M.D., *ex-officio*
Stewart Shankel, M.D., *ex-officio*

Business Modeling & Design:

Gretchen Bolar, *Chair*
Craig Byus
Stephen Cullenberg
Mary Gauvain
Matt Hull
Michael Jenson
Tony Norman
Tim Ralston
Phyllis Guze, M.D. (ex-officio)

Chancellor's Community Advisory Board for the School of Medicine

Douglas Bagley
Sandy Baker
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Lawrence T. Geraty
Bradley Gilbert, M.D.
Dev A. Gnanadev, M.D
Eloise Gómez-Reyes
Larry Grable
Thomas T. Haider, M.D.
Amy Harrison
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Wolde-Ab Isaac
S. Sue Johnson
Steven Larson, M.D.
Ernest C. Levister, M.D.
Javier Machuca, M.D.
Sylvia Martin James
Rose Mayes
Andy Melendrez
Leroy Wm. Nattress, Jr.
Leroy Ounanian, M.D.
David Quam, M.D.
Richard Rajaratnam, M.D.
Michael Rembis
Winston Richards, M.D.
AJ Rogers, M.D.
Cindy Roth
Woodie Rucker-Hughes
Bruce Satzger
Karen Scott
G. Aubrey Serfling
Manuela Sosa, D.D.S.
Joan Sparkman
Cliff Trafzer
Ofelia Valdez-Yeager
V. Diane Woods

Deloitte Consulting

Jason Aulakh
Kevin Byron
Randy Gordon, M.D.
Allyson Gorman
Travis Jacobsmeier
Allison Lunde
Matt McCumber
Mitch Morris, M.D.
Bruce Noyes
Kip Perlstein
Shaun Rangappa, M.D.
Matt Simpson
Robert Williams, M.D.

APPENDIX C. HEALTH SCIENCES COMPENSATION PLAN

Definitions of Faculty Types

Existing Faculty: The current 14 ladder-rank basic science faculty positions in biomedical sciences.

Research Leader Faculty: The School of Medicine strives to create an innovative and distinguished research program, building on areas of research in which UCR has existing strength. To support this goal along with the mission of the medical school, four senior research leader faculty (professor level) will be recruited to advance the medical school's research mission and quickly establish a visible and viable platform for the research enterprise. Research leader faculty will be instrumental in hiring basic science and clinical research scientist faculty. These positions will be ladder rank faculty that may be either basic science or clinical research scientists.

Basic Science/Clinical Research Scientist Faculty: To support the basic science and clinical teaching aspects of a four-year medical school, UCR will need to recruit both basic science and clinical research scientist faculty.

Clinical Education Faculty: Clinical education faculty will be primarily clinical physicians who will support clinical education requirements for clerkships and GME teaching responsibilities of the medical school. These faculty will have academic appointments in a UC academic series.

Community Physicians: Community physicians are voluntary faculty and represent a defined number of FTEs that will receive stipend or other payments to supplement faculty teaching responsibilities. These are not faculty positions within the UC academic series.

Compensation Plan – History and Source

The Health Sciences Compensation Plan (Regents' Plan) was approved by The Regents of the University of California in July 1999 for implementation at all University of California health sciences schools. Any additional procedures or guidelines for the Division must be approved by the Dean, the executive vice chancellor and provost, and the Divisional faculty. In addition to the implementation procedures, plan participants are also subject to the requirements of other University policies, including:

- The University's Conflict of Interest Code, adopted pursuant to the requirements of the Political Reform Act of 1974, which requires designated University employees to disqualify themselves from participating in University decisions in which they have a personal financial interest; and

- The Policy on the Requirements to Submit Proposals and to Receive Awards for Grants and Contracts through the university. A faculty member's compensated outside activities may create an obligation for the faculty member to disclose a financial interest before making or participating in certain university decisions.

Operation of the plan shall not require the expenditure of more state-appropriated (i.e., 19900) funds than would operate without the plan.

Compensation Plan – Membership Requirements

School of Medicine faculty shall be members of the plan if they hold a University appointment at greater than 50 percent of full time, funded by the Division, in any of the following professorial series:

- Professor;
- Professor in Residence;
- Professor of Clinical (e.g., Medicine);
- Adjunct Professor;
- Acting Professor;
- Clinical Professor;
- Visiting Professor;
- Health Sciences School Dean titles;
- Any other title series approved for membership in this plan by the President of UC.

The dean may approve membership in the plan for otherwise eligible faculty members who have retired and are recalled. Membership in the plan shall continue while the plan continues to be in effect. Separation from eligible appointment will terminate membership in the plan.

The academic series included in the Plan are listed in detail in Appendix C – Exhibit 1.

Appendix C – Exhibit 1. Academic Series Used in the Health Science Compensation Plan

Academic Series	Academic Senate?	Tenure Track?	State Funding Restrictions
Ladder-Rank ▪ Professor ▪ Associate Professor ▪ Assistant Professor	Senate	Yes	▪ State funds may not be used in excess of FY base (scale 0)
In-Residence ▪ Professor ▪ Associate Professor ▪ Assistant Professor ▪ Instructor	Senate (professor titles)	No	▪ Generally state funds are limited to 50% of FY base (scale 0)
Clinical X ▪ Professor ▪ Associate Professor ▪ Assistant Professor	Senate	No	▪ Generally state funds are limited to 50% of FY base (scale 0)
Adjunct ▪ Professor ▪ Associate Professor ▪ Assistant Professor ▪ Instructor	Non-Senate	No	▪ Generally state funds are limited to 50% of FY base (scale 0) ▪ Chancellor may approve certain time-limited exceptions to state funding restrictions
Health Sciences Clinical Professor ▪ Professor ▪ Associate Professor ▪ Assistant Professor ▪ Instructor	Non-Senate	No	▪ Generally state funds are limited to 50% of FY base (scale 0) ▪ Chancellor may approve funding <50% appointments on state funds

Compensation Plan – Salary Components

The UCOP HSCP stipulates that all faculty members participating in the plan are eligible for base salary (X-component) and additional compensation (Y and Z component). In particular, the X, Y, and Z-components of the plan are as follows:

- **X-Component:** Serves as the base salary for health sciences faculty as defined by UCOP HSCP Salary Scale. The associated salary scale of faculty members are their ladder rank (Professor, Assistant Professor, and Associate Professor) and level within ladder rank. The X-component is covered by the state through general funds designated for health sciences faculty.

- **Y-Component:** Serves as additional compensation that is negotiated on an individual basis. Local compensation procedures (i.e. campus, department, division, or academic programmatic unit) allow for the payment of additional compensation. The Y-component must be funded through research, clinical revenue or other funds and cannot be funded by state/general funds.

- **Z-Component:** Serves as additional compensation that is awarded on an individual basis. Similarly, the Z-component must be funded through clinical revenue or other funds and cannot be funded by state/general funds.

Faculty Advancement

At the assistant professorship level, a faculty member typically begins with the appointment of assistant professorship at step I and rises to professorship. Targets for advancement are defined as follows:

- Assistant Professor
  - Consists of steps I – IV (4 steps) with 2 years at each step
  - Promotion occurs after 7 years, or 2 years at step IV
- Associate Professorship (confers Tenure)
  - Consists of steps I – III (3 steps) with 2 years at each step
  - Promotion after 6 years, or 2 years at step III
- Professorship
  - Consists of steps I – IX (9 steps)
  - Promotions after 3 years in each of the first four steps
  - The remaining five steps have no normal period of service, and promotion for steps V – IX depends upon special accomplishments and distinction of faculty members
- The personnel process for UC is detailed in the APM (Academic Personnel Manual). Local UCR procedures are detailed in The Call (Office of Academic Personnel).

Source: University of California Office of the President

Appendix D. Proposed School of Medicine Curriculum

TABLE OF CONTENTS

EXECUTIVE SUMMARY

- The mission of the UCR School of Medicine is to improve the health of the people of California and, especially, to serve Inland Southern California by training a diverse workforce of physicians and by developing innovative research and health care delivery programs that will improve the health of the medically underserved in the region and become models to be emulated throughout the state and nation.

The practice of medicine is an interdependent social enterprise. Students need to learn not only their role in an ongoing clinical work environment, but the roles and responsibilities of those they work with, including nurses, pharmacists, public health specialists and others. Learning how to engage in self-directed study becomes an essential part of participating in a community of work. For students, learning venues include clinical conferences, skills workshops with "standardized" patients and simulations, self-directed reading projects as well as direct clinical experiences.

After gaining knowledge, students need to be able to construct a differential diagnosis for common diseases, select appropriate diagnostic tests, manage the patient's illness, and understand the patient's distinctive characteristics and experiences with illness. In diagnosing and managing patients, students need to utilize and integrate psychosocial, pathophysiologic and evidence-based practice perspectives. Students also need more opportunities to develop longitudinal relationships with patients to gain a more holistic understanding of the patient's experiences and a more complete understanding of how to manage and treat the patient, especially patients with chronic illness. The UC Riverside School of Medicine's proposed curriculum will provide students with the skills for life-long learning and the skills to prepare them for the life-long practice of medicine.

The education mission statement for the UCR School of Medicine is to seek to prepare our graduates for distinguished careers in clinical practice, teaching, research, and public service. The faculty and students will actively collaborate to build a strong foundation which will include:

1. Enthusiasm for life-long learning.
2. Commitment to humanistic, compassionate, and ethical care of the individual and family.
3. Skills in effective communication and commitment to education, including teaching students, colleagues, patients and the community.
4. Ongoing development of a broad and flexible base of knowledge and skills that integrates basic, clinical, social, and behavioral sciences with the art of medicine.
5. An understanding of the scientific method, and an appreciation of its application to clinical practice as well as to research.

6. Commitment to promote the health and well-being of the community, and an understanding of the special challenges and requirements of a pluralistic society.
7. Ability to lead in their chosen fields, in settings of rapidly changing technology and societal needs.
8. The ability to address complex societal and medical issues through a systematic, multidisciplinary, and collaborative approach.
9. Commitment to professionalism and ethical principles in carrying out their responsibilities in all aspects of the practice of medicine.

Throughout the course of the curriculum there will be mini clinical evaluation exercises (Mini-CEX) which provide structure to a 10 minute faculty observation of a student or resident with a patient; objective structured clinical examinations (OSCEs); a longitudinal preceptor experience; exposure to common cases in a variety of clinical experiences mostly in the ambulatory setting and less so in inpatient services; teachers and mentors from several clinical departments that will work with students longitudinally throughout the curriculum establishing continuity between students, teachers, tasks and patients; clinical and skill development workshops; half day tutorials; and simulations and standardized patients to develop, refine and elaborate skills used in the clinical setting and to provide opportunities for deliberate practice and feedback.

The year 1 & 2 curriculum for the UCR School of Medicine will be an integrated approach to the science of human biology and disease. There will be five instructional blocks in the first year and four blocks in the second year, followed by a 1-week integrative assessment module. The first year will focus primarily on an interrelated approach to human biological systems. The second year will focus on disease processes.

Years 3 & 4 will provide students with clinical experiences in a Patient Centered Education in the Community. During the third year, half of the year will be spent in medical center-based educational venues and the other half will be in community-based clinical practices. For the educational time devoted to community-based ambulatory experiences, community multi-specialty medical groups will be the venues for education. This variety of clinical experiences will prepare the UC Riverside students with a unique clinical medical education. The fourth year will team students with faculty members interested in common career activities in one of four mentorship academies. Clinical experiences will include four months of elective clerkships and six months of structured experiences, including selectives designed in the setting of multi-professional team care, a scholarly project, community service, and a seminar series.

YEARS 1 & 2:

Medicine is an integrative discipline, pulling simultaneously from many aspects of science to focus on the medical concerns of individual patients. As medical students begin their training to become physicians, it is daunting to survey the spectrum of disciplines and depth of information that they will ultimately use as practicing physicians. Since students will function in an integrative environment, the faculty at UCR have decided that their preparation during the first two years will be best approached in an integrative manner, rather than through the traditional curricular structure of sets of parallel and sequential, independent, departmentally based courses.

To master a sufficient knowledge base in a manner that allows effective use of this information, students must:

1) Continually apply the information being learned to the clinical setting, and
2) Integrate new and previously encountered information to build a richly integrated knowledge base.

Every attempt will be made to bridge these aspects of student training – the basic biology and the practice of medicine. The curriculum for the first two years is organized in a manner to promote the development of a knowledge base that is built on an integrated understanding of medicine.

Human Biology & Disease: An Integrated Curriculum

The block-based curriculum for years one and two will be designed to increase integration of normal human biology with disease processes and clinical skills from the first week of medical school. Basic science will be taught in the context of its application with planned reiteration. Instruction will be coordinated throughout sequentially-taught blocks.

Characteristics: Instruction is driven by cases explored in small groups, laboratories, conferences, clinical skills workshops, and independent study settings accompanied by ten hours of lecture a week. Contact time is limited to twenty-four hours a week to allow time for independent study and electives.

All but one of the thematic blocks is taught in two "passes". There is planned redundancy as well as progressive depth and expectations of competency. Six of the blocks are eight weeks in length, three are five weeks long, and the final block is a special one week integrative assessment module. Curricular “threads” are content themes that run throughout the first and second year primarily, and are woven into the fabric of each of the blocks.

These include:

- Doctoring principles and clinical skills
- Anatomy, histopathology and embryology
- Genetics and genomics
- Population medicine, informatics and clinical reasoning
- Pharmacology
- Special issues are addressed across the curriculum in all four years:
    - Gender-specific health
    - Geriatrics
    - Integrative medicine
    - Cultural components of health and disease
    - Cancer prevention and survivorship
    - Nutrition
    - Professionalism/Ethics

Regular weekly on-line assessments are provided during each block. Although not factored into the final grade, these assessments will allow students to track their understanding and adjust study practices or emphasis as indicated. These assessments also provide direct feedback to the instructors concerning the effectiveness of their presentations and identify individual students who may need special instructional assistance.

Year 1 – Human Biology & Disease

- **Block 1: Foundations of Medicine**
  Surveys principles of genetics, and molecular, cellular and developmental biology in relation to human disease processes. Coverage includes basics of cell cycle regulation, gene expression, protein processing, signal transduction, ion transport and action potentials, genetics, embryology, cancer biology, immunology and pharmacology. Laboratory sessions provide an overview of cell structure and tissue organization along with thematically relevant concepts of histopathology.

- **Block 2: Cardiovascular, Renal, & Respiratory Medicine I**
  Surveys the organization and integrative operation of the cardiovascular, renal, respiratory and autonomic nervous systems and their responses to stress and disease. Selected laboratory exercises demonstrate key principles of electrocardiography, blood pressure regulation, renal function, body fluid composition and volumes, and pulmonary function. Laboratories emphasize methods for measuring cardiac, pulmonary and renal function.

- **Block 3: Gastrointestinal, Endocrine, & Reproductive Health I**
  Surveys gastrointestinal physiology, medical biochemistry and molecular endocrinology (with an emphasis on metabolic disorders and human nutrition). Coverage includes anemia, clotting disorders, hepatitis, alcoholic cirrhosis, diabetes, celiac diseases, osteoporosis, diseases of steroid metabolism, reproductive disorders, thyroid disorders, pituitary disorders, and pharmacokinetics. Gross anatomy lectures and laboratories cover upper and lower GI tract, abdominal cavity and wall, the pelvis and perineum.

- **Block 4: Musculoskeletal Medicine**
  Covers the structures and functions of the peripheral nervous and musculoskeletal systems with a strong clinical emphasis. Students learn how the brain and spinal cord receive sensory input, and control skeletal muscle, and are introduced to neurology. Gross anatomy lectures and laboratories focus on the upper and lower extremities.

- **Block 5: Clinical Neurosciences I**
  Covers the structures and functions of the central nervous system including the visual and auditory systems. Gross anatomy lectures and laboratories focus on the head and neck. Students are also introduced to the neurochemical basis of psychiatric disorders and psychiatry as well as neurogenetics.

Year 2 - Human Biology and Disease

- **Block 6: Infectious Diseases**
  Covers the pathophysiology, pharmacology, physical diagnosis and treatment of bacterial, viral, fungal and parasite-mediated infectious diseases; host defense and immunity; immune system disorders; topics in clinical hematology and oncology; and epidemiology and clinical reasoning skills.

- **Block 7: Gastrointestinal, Endocrine, & Reproductive Health II**
  Advanced clinical perspective of anatomy, biochemistry, pathophysiology, physical diagnosis and imaging associated with endocrinology, reproductive health and disease, GI diseases, gender-specific diseases, skin manifestations of systemic disease, common infectious diseases and therapeutics, common cancers, prevention, and nutrition.

- **Block 8: Clinical Neurosciences II**
  Covers advanced clinical perspective of neurology, neuropathology, psychiatry, and neuropharmacology that is coordinated with physical and psychological clinical skills development.

- **Block 9: Cardiovascular, Renal, & Respiratory Medicine II**
  Pathology and pathophysiology of these systems (continued), including hypertension, developmental disorders, therapeutics - pharmaceuticals and other treatments, clinical trials and epidemiology, common cancers, common infectious agents and therapeutics, and prevention.

- **Block 10: Integrative Assessment**
  Students are provided USMLE Board review presentations on various subjects, complete the NBME Basic Science Comprehensive Exam, and must demonstrate mastery of their clinical skills by passing the OSCE.

Course structure: Coursework will be structured and presented in a manner to promote the integrated learning described above. Each week will have a specific "theme" and will follow a similar format. The central learning experience will be the Problem Based Learning (PBL) sessions in which a clinical case is used to explore and integrate the relevant biology as well as clinical practice and social aspects of the material for the week. Students will have been introduced to the PBL approach during Orientation Week. Sessions will be two hours each, twice a week, for presentation and follow up of each case. Lectures (limited to two hours per day) will be presented to provide background, and laboratories or other small group formats will provide additional learning experiences.

These lab/small group experiences will occur normally three afternoons each week. Starting with the second week, one of the labs will focus on histology and pathology to develop the student's ability to visualize and integrate structure and function at all levels. Anatomy will be introduced in the first block, though the primary dissection experience will begin in Block 2. Finally, there will be additional laboratory experiences to supplement the specific themes of the week.

SKILLS COURSES: Problem Based Learning (PBL), Introduction to Physical Exam (IPE) and Doctoring are the skills courses in the first two years of medical school. Students are required to attend all sessions and must achieve a passing grade before being promoted into the clinical years. The subject content of these courses is correlated with the core lecture series topics as much as possible. For example, if the core lectures for a week are on cardiology, then the PBL case and the IPE session topics will also cover cardiology.

Problem Based Learning has been the core of clinical learning for many years. Students learn and retain better if their education involves the application of their basic science knowledge to solving a patient-based case, just as they will in the clinical years and in actual practice.

PBL cases are selected that will illustrate the clinical applications of the material being presented for that week in the core lecture series. Students are in small groups and a professor serves as a facilitator. All of the professors have read and studied the case before the student groups meet. During the first session

(typically on Monday), the students are challenged to develop a differential diagnosis of the patient's problem and to become more selective as the case proceeds. They are also challenged on the meaning of various historical, physical, or laboratory findings and their significance to the case. At the end of the first session, students are assigned learning issues and are asked to consult at least two references; one must be from a peer-reviewed journal and one other source. Students prepare written reports on the learning issues and reconvene (usually on Friday) to share their information with the other students and discuss how these relate to the patient's specific case.

Introduction to Physical Exam (IPE) has two parts. The first hour is a lecture on the system being covered, usually by a specialist in that field of medicine. Then the students are divided into small groups of six, with one physician instructor and one "standardized" patient for each group. The professors meet before each session again to ensure comparable learning objectives for the physical exam among each student group. The standardized patient, along with the physician, gives the students immediate feedback as to their performance. Students learn the basic components and how to focus a physical examination to correlate with the anatomy they are learning and according to the medical situation. Each session's topic is once again correlated with the core lecture series as much as possible.

By the end of the second year, students must demonstrate proficiency and pass a final comprehensive skills test on a 3-station OSCE.

Doctoring is a three year required curriculum that is threaded through basic science and clinical training. It is designed to provide students with knowledge, skills and attitudes which are difficult to address in other aspects of the curriculum. One afternoon every other week will be spent in the Doctoring experience in which hands-on skills with patients are developed.

The specific focus of Doctoring is slightly different in each of the three years, to match the experience and knowledge base of the students. The course is taught in small groups with preceptors and tutors, typically a physician and psychologist or social worker.

Doctoring 1 has a major focus on the aspect of the doctor-patient interaction which has to do with obtaining and conveying information. Specifically:

- focus on understanding key components of the doctor-patient interaction
- learning the essentials of obtaining and conveying information
- using open-ended questions, empathic listening, appropriate reassurance, assessment of readiness for health behavior change, and reading of non-verbal cues

Doctoring 2 has a focus on the aspect of more complex involvement with patients and patient's families. Specifically:

- More challenging patients with whom to interact, and more difficult information to communicate.
- In addition to collecting and recording the Subjective and Objective components of a patient interview and exam, students develop their own Assessment and Plan for the patient.

Preceptorship is also a component of Doctoring 1 and 2. Students are teamed up one-on-one with local physicians, shadowing them in their offices, clinics and hospital visits, allowing them to develop the patient interaction skills learned in the Doctoring sessions.

Written Formal Evaluations

- A narrative evaluation is completed by tutors twice each year
- A mid-year evaluation will be sent to students only
- An end of year evaluation "counts", i.e., goes to Student Affairs Office

Evaluation - PBL, IPE & Doctoring: In addition to the above evaluation for Doctoring, students will also be evaluated on the basis of other performance criteria. Evaluations will be completed by the small group tutors and preceptors and will include ratings on a qualitative scale in areas such as problem solving, use of Information, group process, and clinical skills. Students will also be expected to evaluate their own progress, identify areas of deficiency (in both their individual approaches to learning and in their group interactions), and propose a plan to improve in identified areas of weakness.

Examinations: Every block will conclude with the following:

- A comprehensive final exam integrating all aspects of the course. This may include a laboratory practical component that is appropriate to the objectives of the course. The passing grade of the final exam of each course will be established in advance by its course chairs.

- Individual clinical skill assessment (*e.g.* patient interviewing or physical examination). It is expected that the students' skills will grow throughout the year. Criteria for acceptable performance in each course will increase as the year progresses, and will be published in advance.

To pass the blocks, a student must meet the passing criteria of both of the above. In addition, there will be weekly "self-assessments" (i.e. quizzes with scores that are not factored into the student's final grade). Their primary purpose is to provide a "low stakes" method that will allow students to evaluate progress and will allow faculty to identify students who may need individual assistance. In

order to accomplish these purposes, students are expected to complete each quiz in the prescribed timeframe. Otherwise they are liable to receive a grade of Incomplete for the course.

YEAR THREE:

At the beginning of the third year, students will participate in a two-week Clinical Foundations Course, an intense clinical experience that will provide students with the basic skills that they will need to be prepared to partake in either the Medical Center-Based Clerkships or the Community-Based Clerkships.

After the Clinical Foundations Course, half of the students will be assigned to Group A and the other half will be assigned to Group B. At the end of twenty-six weeks, the students who were assigned to the Medical Center-Based Clerkship will then rotate to the Community-Based Clerkship and vice-versa. The following lists the clerkships and the amount of time students will be assigned to the clerkships:

<u>Group A: Medical Center-Based clinical clerkships: 26 weeks</u>

- 8 weeks – Medicine
- 4 weeks – Surgery
- 4 weeks – Pediatrics
- 4 weeks – EM
- 2 weeks – Neurology
- 4 weeks – Family Medicine

<u>Group B: Community-Based Clerkships: 26 weeks</u>

- 2 weeks primary care – Internal Medicine or Family Medicine
    - Continuity (primary care)- 1 half day per week for 24 weeks
- 6 weeks – Obstetrics-Gynecology
- 4 weeks – Psychiatry
- 4 weeks – Surgery
- 4 weeks – Pediatrics including adolescent medicine
- 2 weeks – Selective: imaging, pathology, dermatology, other
- 4 weeks – Community service project

The main purpose of clinical clerkships is to move students toward a progressively higher level of responsibility for patient care, focusing on levels of professional work and competence.

The Medical Center-Based Clerkships will provide students with opportunities to be exposed to medical care that is provided either to inpatients or to patients that are seen by specialists, subspecialists or family practitioners in the hospital setting or clinic. The Community-Based Clerkships will provide students with opportunities to develop a panel of patients that they will follow over at least twenty-six weeks. When assigned to clerkships other than primary care, the

student will return to their primary care practice one half day a week. The students will be in the role of a primary care provider for their patients, and any issues that arise for their patients will “trump” any other clerkship responsibilities and they will accompany their patients to appointments in specialty clinics and inpatient services. Additionally, the Community-Based Clerkships will give students an opportunity to have experiences in working in ambulatory settings, follow patients throughout their clinical experiences, and work within a team.

For each of the clerkships, a clerkship director will be identified who will have the following responsibilities:

- To create a realistic set of clerkship objectives, skills, knowledge and attitudes that are tied to the Graduation competencies and directly link objectives to clerkship activities and evaluation.
- Maintain orientation and common didactics across sites with the inclusion of imaging.
- Include students in activities related to patient safety, QI (Quality Improvement), chronic care initiatives, and the use of electronic patient records.
- Require a practice-based learning activity.
- Clearly define students’ roles and responsibilities both to patients and to other members of the clinical team and hold them accountable.
- Allow students to develop independent clinical judgment, decision-making and communication skills based on individual assessment.
- Require students to manage a significant number of new patients each week, or extend their range of confidence with procedures.
- Include direct observation or OSCEs in making final assessments.
- Increase ambulatory experience with continuity in the same setting rather than a variety of experiences across different clinics and sites.
- Support the students’ connection with their patients.

Longitudinal Clerkships: During the third year, there will be experiences that occur across the entire year. Students will come together one-half day every other week and partake in the longitudinal courses on a rotating basis. These courses are:

Doctoring 3 which will have a focus on systems (family, community, health care) and the opportunity it provides for students to reflect on experiences from the clerkships. The learning objectives for the year are to:

- Understand the social, economic, legal and ethical context of medical decision-making
- Become aware of the impact of personal bias and experience on medical decision-making
- Develop skills in working in a team, including understanding role differentiation on a team

- Use the clerkship experiences to reflect on and thoughtfully make the transition from student to professional

Imaging which will include standard radiology and cross sectional imaging. The goals of this clerkship are to have the student:

- Develop basic skills in radiological diagnosis (how to read an x-ray)
- Be familiar with the scope of different imaging modalities and be aware of patients' experience in undergoing radiological procedures
- Know the indications, contraindications, limitations and cost effectiveness of radiological examination
- Know orderly imaging workup for common clinical disorders
- Learn how to use the radiologist as a consultant

Advisor/Mentorship Program will afford the students an opportunity to explore clinical specialties in greater depth with an emphasis on building clinical skills and understanding the practice rewards and demands of different specialties. The objectives of this program will be to provide the student with the opportunity to:

- Have personalized mentorship & advice
- Have observation and feedback on clinical skills
- Have an opportunity to integrate knowledge and skills throughout the entire year
- Have an opportunity to pursue interests and improve skills in clinical research
- Have an opportunity to "test drive" or explore potential career interests or improve skills in deficiency areas

One-half day every other week the students will come together at the UC Riverside campus for case based learning, problem based learning, lectures and review of clinical involvement. Students will be evaluated for each clerkship and the longitudinal courses. There will also be web-based cases to be completed for each clerkship. Students will keep a PDA log and enter their patients every week so that course directors can assure that they have the appropriate experience in each clerkship.

At the end of the third year, students will have a final clinical skills assessment that will include specific clinical examinations, OSCEs and case-based examinations.

YEAR FOUR:

The fourth year will be approximately ten months in length. There will be four months of electives. The rest of the year will be structured with required clinical courses, selectives (which will be designed to occur in the setting of multi-professional team care and telemedicine), a scholarly project, community service, and a seminar series that focuses on return to the basic sciences as well as other general topics.

Academies: Students and faculty members interested in common career activities will make up the academies. Students will chose which academy they would like to be affiliated with during the latter part of year three. The academies can be thought of as a society of faculty and students with the goal of providing career advice and mentoring, providing longitudinal experiences through preceptorship and creative projects, providing direction for electives and selectives, assuring completion of fourth year requirements, and being a base for the development of a senior project.

Initially there will be four academies: Community-Primary Care, Acute Care, Applied Anatomy and Medical Sciences. Each academy will have a faculty director who, with an advisory committee, would develop the mission, goals and objectives for their specific academy. The Academy Director will be responsible for assuring that students meet the Graduation Competencies and are prepared for an internship.

Required: Required educational activities will include clinical experiences in advanced inpatient clerkship in Internal Medicine, advanced clerkship in Surgery or its subspecialties, advanced clerkship in Acute Medicine (ER; ICU; etc), and Community Based Medicine such as experiences in ambulatory surgical centers, OB-GYN, Pediatrics, Family Medicine, ambulatory IM or IM subspecialties.

Community Project: In addition to the above required clinical experiences, the students will develop a project that involves the community, and particularly underserved areas. This could be a clinical or academic longitudinal experience, and may include teaching activities, research or direct patient care. Students may also continue the community project they were involved in during year three.

Scholarly Project: The purpose of the scholarly project is to develop skills in asking questions in clinical or basic investigation, writing about and verbally presenting ideas, and intellectual collaboration with a mentor. The project may be longitudinal across the entire fourth year or directly relate to the student's community project. Abstracts of projects will be presented at the senior scholarship day.

Many of our medical students have had extensive undergraduate research experience in the laboratory based basic sciences. All students will be given an opportunity to pursue laboratory based research concerning the molecular basis of disease and treatment with the biomedical sciences faculty and others on campus.

Web-based cases and clinical problems will be utilized during the third and fourth year for all clinical rotations. Tele-education and tele-conferencing will assure that all students in clinical sites will have some consistency in their education.

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Alan G. Robinson, M.D.	Associate Vice Chancellor, Medical Sciences and Executive Associate Dean
Neil H. Parker, M.D.	Senior Associate Dean for Student Affairs and Graduate Medical Education
LuAnn Wilkerson, Ed.D.	Senior Associate Dean for Medical Education

The UCR School of Medicine Curriculum Planning Committee:

Craig Byus, Ph.D.	Dean, UCR/UCLA Biomedical Sciences
Phyllis A. Guze, M.D.	Professor of Medicine, David Geffen School of Medicine at UCLA, Consultant, (Co-Chair)
Lawrence Loo, M.D.	Clinical Professor, UCR/UCLA Biomedical Sciences
Kiki Nocella, Ph.D.	Vice Provost of Health Affairs, UCR
Stewart Shankel, M.D.	Clinical Professor, UCR/UCLA Biomedical Sciences, (Co-Chair)
Neal Schiller, Ph.D.	Associate Dean, UCR/UCLA Biomedical Sciences
Carolyn Peebles	Executive Administrative Specialist for Health Affairs

UCR School of Medicine Mission Statement

The mission of the UCR School of Medicine is to improve the health of the people of California and, especially, to serve Inland Southern California by training a diverse workforce of physicians and by developing innovative research and health care delivery programs that will improve the health of the medically underserved in the region and become models to be emulated throughout the state and nation.

UCR School of Medicine
Medical Education Mission Statement

The UC Riverside School of Medicine seeks to prepare our graduates for distinguished careers in clinical practice, teaching, research, and public service. Recognizing that medical school is but one phase in a physician's education, we must create an environment in which students prepare for a future in which scientific knowledge, societal values, and human needs are ever changing.

The faculty and students will actively collaborate to build a strong foundation which will include:

1. Enthusiasm for life-long learning.
2. Commitment to humanistic, compassionate, and ethical care of the individual and family.
3. Skills in effective communication, and commitment to education, including teaching students, colleagues, patients and the community.
4. Ongoing development of a broad and flexible base of knowledge and skills that integrates basic, clinical, social, and behavioral sciences with the art of medicine.
5. An understanding of the scientific method, and an appreciation of its application to clinical practice as well as to research.
6. Commitment to promote the health and well-being of the community, and an understanding of the special challenges and requirements of a pluralistic society.
7. Ability to lead in their chosen fields, in settings of rapidly changing technology and societal needs.
8. The ability to address complex societal and medical issues through a systematic, multidisciplinary, and collaborative approach.
9. Commitment to professionalism and ethical principles in carrying out their responsibilities in all aspects of the practice of medicine.

UCR School of Medicine
Graduation Competencies

The School of Medicine at UC Riverside expects all of its students to demonstrate the following competencies prior to graduating with the M.D. degree. These objectives are not intended to supersede the objectives that are specific to individual courses.

PATIENT CARE that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

1. Conduct patient-centered encounters that balance the needs of the patient with time constraints of practice. Such encounters include:
    a. ascertaining the patient's goals for the encounter,
    b. appreciating the patient's experience of illness,
    c. performing a focused physical examination, and
    d. negotiating diagnostic and management priorities.
2. Accurately perform and document both complete and focused histories and physical examinations that are based on the pathophysiology of presenting complaints, and that address relevant psychosocial and family issues.
3. Prioritize patients' problems, formulate appropriate differential diagnoses, and develop appropriate plans for diagnosis and/or management.
4. Perform the following basic diagnostic and therapeutic procedures:
    - Basic first aid
    - Basic Life Support (BLS Certification)
    - Suturing simple lacerations
    - Drawing venous blood
    - Starting an IV
    - Basic airway management
5. Be familiar with the technique for a normal vaginal delivery.
6. Be able to discuss the principles of and the relative advantages and disadvantages of various therapeutic modalities, including surgery, pharmacology, physical rehabilitation, mental health care, behavioral modification and complementary and alternative medicine, as applied to common clinical situations.
7. Use epidemiological principles and data to formulate measures for the care of individuals and communities and be able to read the medical literature.
8. Evaluate the roles that unemployment, poverty, and lack of education play as obstacles to quality health care.
9. Develop and implement individualized risk reduction plans based on a culturally-sensitive assessment of important medical and social conditions including sexually transmitted diseases, substance abuse, and interpersonal violence.

MEDICAL KNOWLEDGE about established and evolving biomedical, clinical, and cognate (e.g., epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.

1. Know the scientific principles that underlie current understanding of normal human development, function, and disease. Be able to accurately express and use these principles in discussing health maintenance, common disease processes, and disease evaluation and management.
2. Demonstrate an understanding of social and behavioral factors that influence patients' responses to health and disease. Such factors include:
    a. specific cultural, ethnic and societal beliefs and behaviors,
    b. issues of health literacy and limited English proficiency,
    c. patients' age, education, finances, and family resources,
    d. alternative or complementary medical practices within patients' communities.
3. Understand the scientific basis and interpretation of common diagnostic modalities, including: imaging, electrocardiograms, blood and urine chemistries, pathologic studies, and functional assessment tests. Discuss the indications, contraindications and cost-effectiveness of common diagnostic studies.
4. Demonstrate knowledge of common problems and diseases for diverse populations:
    a. Presenting complaints
        i. Abdominal pain
        ii. Anxiety
        iii. Change in mental status
        iv. Chest pain
        v. Chronic pain
        vi. Cough
        vii. Diarrhea
        viii. Headache
        ix. Obesity
        x. Trauma
        xi. Heartburn
        xii. Low back pain
        xiii. Shortness of breath
        xiv. Substance abuse
        xv. Pharyngitis
    b. Diseases
        i. Alcoholism
        ii. Arthritis
        iii. Asthma
        iv. Cancer
        v. Dementia
        vi. Depression
        vii. Diabetes

viii. Osteoporosis
ix. HIV
x. Hypertension
xi. Hyperlipidemia
xii. Otitis Media
xiii. Pneumonia
xiv. Psychosis
xv. TB
xvi. UTI
xvii. Upper respiratory infection
xviii. Vaginitis

c. Conditions
i. Pregnancy
ii. Menopause
iii. Domestic violence
iv. End-of-life issues

5. Understand basic issues for promoting health and preventing disease, including nutrition, exercise, psychological health, preventive pharmacology, genetic predisposition to disease, sanitation, environmental and workplace hazards, life-styles, immunizations, and apply this understanding to patient management.
6. Assess the health status, demographics and socioeconomic characteristics of medically underserved populations.
7. Recognize differences in belief systems, values, languages, religions, and health practices that impact the medical care of culturally diverse medically underserved populations.
8. Know when and how to report incidents of domestic violence including: child, elder, and spousal abuse.

PRACTICE-BASED LEARNING AND IMPROVEMENT that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care.

1. Understand importance of life-long learning to adequately care for patients, to participate in patient education, and to pursue creative scholarly endeavors
2. Use computer-based techniques, including PubMed and other relevant databases, to acquire new information and resources for learning.
3. Identify and use reliable, authoritative sources of medical information.
4. Organize personal resources efficiently and systematically using electronic tools and other methods.
5. Describe and assess common scientific methodologies used in clinically-relevant medical research.
6. Identify the evidential value, organization and logistics of various types of clinical trials, and be able to advise patients concerning their participation in or interpretation of these.

7. Read, summarize and critique research and disease review articles in peer-reviewed journals such as New England Journal of Medicine.
8. Use evidence-based approaches as tools to decide whether to accept new findings, therapies and technologies for incorporation into medical practice.
9. Utilize decision-support systems and guidelines for clinical decision making, including an understanding of the roles of preferences and probabilities.
10. Understand and use continuous quality improvement practices
11. Translate questions that arise from daily clinical practice into formal research hypotheses.

INTERPERSONAL AND COMMUNICATION SKILLS that result in effective information exchange and teaming with patients, their families, and other health professionals.

1. Demonstrate interpersonal skills that build rapport and empathic communication with patients and their families across socioeconomic, racial, and cultural boundaries.
2. Make both complete and focused case presentations that are accurate and well-organized; prepare and maintain complete, accurate, well-organized medical records
3. Demonstrate a commitment to and skill in teaching medical students, colleagues, and other members of the allied health profession using the concepts and vocabulary of contemporary basic and clinical science.
4. Function as a productive member of a team.
5. Work collaboratively with health professionals from other disciplines.
6. Skillfully address sensitive issues in an effective, compassionate, non-judgmental manner. Such issues include
    a. screening for alcohol and drug abuse, domestic violence, and sexual activities,
    b. screening for cancer risks
    c. giving "bad news".
7. Describe and use sound principles for changing patients' behavior in order to promote and improve their health.
8. Inform patients and their families about health and illness in a way that is culturally-sensitive, jargon-free and appropriate to their needs, including counseling on prevention and psychosocial issues.
9. Obtain informed consent from patients by clearly explaining the risks, benefits, and alternatives for common medical and surgical procedures in a culturally sensitive manner.

PROFESSIONALISM, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

1. Demonstrate reliability, dependability, and integrity in interactions with colleagues and patients.
2. Deal with professional mistakes openly and honestly in ways that promote patient trust and self-learning.
3. Accurately assess one's personal strengths and limitations, relevant to one's practice of medicine and continued learning.
4. Develop abilities to receive and provide constructive feedback as part of peer and self-assessment of professional behaviors.
5. Understand appropriate coping mechanisms for dealing with stress, intellectual uncertainty, interpersonal conflict, and issues related to power.
6. Use basic ethical concepts and approaches to identify and analyze the ethical dimensions of common situations in medical practice, health policy, and research.
7. Understand the obligation to treat the individual patient, and discuss the conflicts between caring for a patient and caring for a population.

SYSTEM-BASED PRACTICE, as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

1. Function under common time constraints in outpatient primary care settings, including managed care groups and underserved populations.
2. Discuss changing social, economic, and political factors that are affecting the patterns of health care delivery in the United States, and specifically in Southern California, especially those affecting underserved communities.
3. Know the structure and function of health care delivery and insurance systems currently used in the United States.
4. Understand how payment systems for medical care affect decision making and care provision, and discuss strategies for delivering quality care in the face of reimbursement restrictions.
5. Apply cost-effectiveness analysis to specific instances of diagnosis and treatment of disease and of health promotion.
6. Understand the principles of medical record keeping and the use of electronic records.
7. Know how and when to use consultants.
8. Identify and use resources and ancillary health care services for patients in situations in which social and economic barriers to access exist.
9. Develop skills in the development and use of telemedicine technologies that will aid in providing quality care to an underserved patient population.
10. Apply evolving technology to the solution of problems in health care delivery, access, and quality for underserved populations.

LEADERSHIP and COMMUNITY ACTION, addressing the healthcare disparities in California and the nation, with emphasis on the needs of the medically underserved.

1. Understand how to deploy ones own strengths and weaknesses as a leader in analyzing and addressing a variety of health care problems common in underserved communities.
2. Demonstrate the ability to work effectively in various types of heterogeneous teams, e.g., multi-professional health care delivery teams, research teams, community action teams, learning groups.
3. Apply appropriate collaborative strategies in decision making that take into account the diversity attitudes and beliefs of those who will be affected.
4. Demonstrate the ability to work effectively in partnership with community members in improving health care access and quality through needs assessment, program development, and political action.
5. Demonstrate the ability to work in health care organizations that influence health policy and practices, e.g., professional organizations, government agencies, health care delivery systems, health care purchaser groups, and political organizations.
6. Demonstrate the ability to work effectively across disciplines, settings of care, and with public and private payers, and state and federal agencies to promote and accomplish improvements in access and quality of care for underserved populations.
7. Analyze the implications of current and proposed health care finance partners and practices for access to care and health care outcomes in underserved communities.

Curriculum

School of Medicine

Year 1

August

Orientation to HB&D	Block 1: Foundations of Medicine	Block 2: Cardiovascular, Renal and Respiratory Medicine I	Block 3: Gastrointestinal, Endocrine and Reproductive Medicine I	Block 4: Musculoskeletal Medicine	Block 5: Medical Neurosciences I
	Doctoring PBL and Clinical Skills	Doctoring PBL and Clinical Skills	Doctoring PBL and Clinical Skills	Doctoring PBL and Clinical Skills	Doctoring PBL and Clinical Skills

Year 2

August

Block 6: Infectious Diseases	Block 7: Gastrointestinal, Endocrine, and Reproductive Medicine II	Block 8: Medical Neurosciences II	Block 9: Cardiovascular, Renal and Respiratory Medicine II	Block 10: Integrative Assessment
Doctoring PBL and Clinical Skills	Doctoring PBL and Clinical Skills	Doctoring PBL and Clinical Skills	Doctoring PBL and Clinical Skills	

Year 3

June

Clinical Foundations 2 weeks	Group A: Medical Ctr-Based Clerkships (26 weeks) Medicine (8 weeks) Surgery (4 weeks) Pediatrics (4 weeks) Emergency Med (4 weeks) Neurology (2 weeks) Family Medicine (4 weeks)	Group A: Community-Based Clerkships (26 weeks) Primary Care (2 weeks) Continuity Primary Care (1 half day/week for 24 weeks) Surgery (4 weeks) Pediatrics (4 weeks) Psychiatry(4 weeks) OB-Gyn (6 weeks) Selective (2 weeks) Community Service (4 weeks)	Clinical Performance Examination
	Group B: Community-Based Clerkships (26 weeks) Primary Care (2 weeks) Continuity Primary Care (1 half day/week for 24 weeks) Surgery (4 weeks) Pediatrics (4 weeks) Psychiatry (4 weeks) OB-Gyn (6 weeks) Selective (2 weeks) Community Service (4 weeks)	Group B: Medical Ctr-Based Clerkships (26 weeks) Medicine (8 weeks) Surgery (4 weeks) Pediatrics (4 weeks) Emergency Med (4 weeks) Neurology (2 weeks) Family Medicine (4 weeks)	Clinical Performance Examination

Doctoring 3

Longitudinal Radiology Course

Longitudinal Advisor/Mentorship

Year 4

July

- Medical Academies:
  - Community / Primary Care
  - Acute Care
  - Applied Anatomy
  - Medical Sciences
- 4 months of Electives
- 6 months of required clinical experiences, including:
  - Advanced Clinical Clerkships in IM, Surgery, Acute Medicine, and Community-Based
  - Medicine Seminar Series
  - Seminar Series Community Service
  - Community Service
  - Scholarly Project

UC Riverside

INTRODUCTION: The practice of medicine is an interdependent social enterprise. Students need to learn not only their role in an ongoing clinical work environment, but the roles and responsibilities of those they work with such as the role of the nurse, pharmacist, radiologist, etc. Learning how to engage in self-directed study becomes an essential part of participating in a community of work. For students, learning venues include clinical conferences, skills workshops with simulations, self-directed reading projects as well as direct clinical experiences.

After gaining knowledge, students need to be able to construct a differential diagnosis for common diseases, select appropriate diagnostic tests, manage the patient's illness, and understand the patient's distinctive characteristics and experiences with illness. In diagnosing and managing patients, students need to utilize and integrate psychosocial, pathophysiologic and evidence based practice perspectives. Students also need more opportunities to develop longitudinal relationships with patients to provide students with a holistic understanding of the patient's experiences and a more complete understanding of how to manage and treat the patient, especially patients with chronic illness. The UC Riverside School of Medicine proposed curriculum attempts to provide students with the skills for life-long learning and the skills to prepare them for the life-long practice of medicine.

Throughout the course of the curriculum there will be mini clinical evaluation exercises (Mini-CEX) which provides a structure to a 10 minute faculty observation of a student or resident with a patient; objective structure clinical examination (OSCE); a longitudinal preceptor experience; exposure to common cases in a variety of clinical experiences mostly in the ambulatory setting and less so in inpatient services; teachers and mentors from several departments that will work with students longitudinally throughout the curriculum establishing continuity between students, teachers, tasks and patients; clinical and skill development workshops; half day tutorials; and simulations and standardized patients to develop, refine and elaborate skills used in the clinical setting and to provide opportunities for deliberate practice and feedback.

Doctoring is a three year required curriculum that is threaded through basic science and clinical training. It is designed to provide students with knowledge, skills and attitudes which are difficult to address in other aspects of the curriculum. The specific focus of Doctoring is slightly different in each of the three years, to match the experience and knowledge base of the students. The course is taught in small groups with preceptors and tutors.

The year 1 & 2 curriculum for the UCR School of Medicine will be an integrated approach to the science of human biology and disease. There will be 10 blocks, with 5 blocks in the first year and 5 blocks in the second year. The first year will primarily focus on an interrelated approach to human biological systems. The second year will focus on disease processes.

Years 3 & 4 will provide students with clinical experiences in a Patient Centered Education in the Community. During the third year, half of the year will be spent in medical center-based educational venues and half the year will be in community-based clinical practices. For the time spent in the medical center-based clinical experience, Riverside County Regional Medical Center, Kaiser-Permanente Medical Center and Eisenhower Medical Center have indicated interest in becoming a teaching venue for the UC Riverside School of Medicine. However, these sites are not exclusive and other venues will be encouraged and explored as needs arise. For the educational time devoted to community-based ambulatory experiences, Riverside Medical Clinic, Beaver Medical Group, San Bernardino Medical Group, Riverside County Family Care Centers, and Riverside Center for Behavioral Medicine and Psychiatric Medical Group have indicated interest in becoming a teaching venue for the UC Riverside School of Medicine. Currently, staff at each of these community-based clinical practices participates in years 1 and 2 of the UCLA student curriculum based at Riverside. However, these sites are not exclusive and other venues will be encouraged and explored as needs arise. This variety of clinical experiences will prepare the UC Riverside students with a unique clinical medical education.

In the fourth year, students will choose to become a member of an academy. Students and faculty members interested in common career activities will make up the academies. Initially there will be four academies: Community-Primary Care, Acute Care, Applied Anatomy and Medical Sciences. Each academy will have a faculty director who, with an advisory committee, will develop the mission, goals and objectives for their specific academy. In the fourth year, there will be 4 months of electives. The rest of the year will be structured with required clinical courses, selectives (which will be designed to occur in the setting of multi-professional team care and telemedicine), a scholarly project, community service, and a seminar series that focuses on return to the basic sciences as well as other general topics.

Web based cases and clinical problems will be utilized during the third and fourth year for all clinical rotations. Tele-education and teleconferencing will assure that all students in clinical sites will have some consistency in their education.

The more complete description of the entire four year curriculum is in the following sections.

YEARS 1 & 2: Human Biology & Disease: An Integrated Curriculum

Medicine is an integrative discipline, pulling simultaneously from many aspects of science to focus on the medical concerns of individual patients. As medical students begin their training to become physicians, it is daunting to survey the spectrum of disciplines and depth of information that they will ultimately use as practicing physicians. Since students will function in an integrative environment, the faculty at UCR have decided that their preparation during the first two years will be best approached in an integrative manner, rather than through the traditional curricular structure of sets of parallel and sequential, independent, departmentally based courses.

To master a sufficient knowledge base in a manner that allows effective use of this information, students must:

1) Continually apply the information being learned to the clinical setting, and
2) Integrate new and previously encountered information to build a richly integrated knowledge base.

Every attempt will be made to bridge these aspects of student training – the basic biology and the practice of medicine. The curriculum for the first two years is organized in a manner to promote the development of a knowledge base that is built on an integrated understanding of medicine.

Human Biology and Disease: The block-based curriculum for years one and two has been designed to increase integration of normal human biology with disease processes and clinical skills from the first week of medical school onward. Basic science is taught in the context of its application with planned reiteration. Instruction is coordinated throughout sequentially-taught blocks.

Characteristics: Instruction is driven by cases explored in small group, laboratories, conferences, clinical skills workshops, and independent study settings accompanied by 10 hours of lecture a week. Contact time is limited to 24 hours a week to allow time for independent study and electives.

All but one of the thematic blocks is taught in two "passes". There is planned redundancy as well as progressive depth and expectations of competency. Most blocks are 8 weeks in length. Curricular Threads are woven into the fabric of each block, and include:

- Doctoring principles and clinical skills
- Anatomy, histopathology and embryology
- Genetics and genomics
- Population medicine, informatics and clinical reasoning
- Pharmacology

Special issues are addressed across the curriculum in all four years:

- Gender-specific health
- Geriatrics
- Integrative medicine
- Cultural components of health and disease
- Cancer prevention and survivorship
- Nutrition
- Professionalism/Ethics

Regular assessments during each block allow students to track their understanding and adjust study practices or emphasis as indicated.

Year 1 – Human Biology & Disease

- **Block 1: Foundations of Medicine** (8 weeks)
  Surveys principles of genetics, and molecular, cellular and developmental biology in relation to human disease processes. Coverage includes basics of cell cycle regulation, gene expression, protein processing, signal transduction, ion transport and action potentials, genetics, embryology, cancer biology, immunology and pharmacology. Laboratory sessions provide an overview of cell structure and tissue organization along with thematically relevant concepts of histopathology.

- **Block 2: Cardiovascular, Renal, & Respiratory Medicine I** (8 weeks)
  Surveys the organization and integrative operation of the cardiovascular, renal, respiratory and autonomic nervous systems and their responses to stress and disease. Selected laboratory exercises demonstrate key principles of electrocardiography, blood pressure regulation, renal function, body fluid composition and volumes, and pulmonary function. Laboratories emphasize methods for measuring cardiac, pulmonary and renal function.

- **Block 3: Gastrointestinal, Endocrine, & Reproductive Health I**
  (8 weeks)
  Surveys gastrointestinal physiology, medical biochemistry and molecular endocrinology (with an emphasis on metabolic disorders and human nutrition). Coverage includes anemia, clotting disorders, hepatitis, alcoholic cirrhosis, diabetes, celiac diseases, osteoporosis, diseases of steroid metabolism, reproductive disorders, thyroid disorders, pituitary disorders, and pharmacokinetics. Gross anatomy lectures and laboratories cover upper and lower GI tract, abdominal cavity and wall, the pelvis and perineum.

- **Block 4: Musculoskeletal Medicine** (5 weeks)
  Covers the structures and functions of the peripheral nervous and musculoskeletal systems with a strong clinical emphasis. Students learn

how the brain and spinal cord receive sensory input, and control skeletal muscle, and are introduced to neurology. Gross anatomy lectures and laboratories focus on the upper and lower extremities.

- **Block 5: Clinical Neurosciences I** (5 weeks)
  Covers the structures and functions of the central nervous system including the visual and auditory systems. Gross anatomy lectures and laboratories focus on the head and neck. Students are also introduced to the neurochemical basis of psychiatric disorders and psychiatry as well as neurogenetics.

Year 2 - Human Biology and Disease

- **Block 6: Infectious Diseases** (8 weeks)
  Covers the pathophysiology, pharmacology, physical diagnosis and treatment of bacterial, viral, fungal and parasite-mediated infectious diseases; host defense and immunity; immune system disorders; topics in clinical hematology and oncology, and epidemiology and clinical reasoning skills.

- **Block 7: Gastrointestinal, Endocrine, & Reproductive Health II** (8 weeks)
  Advanced clinical perspective of anatomy, biochemistry, pathophysiology, physical diagnosis and imaging associated with endocrinology, reproductive health and disease, breast, GI diseases, gender-specific diseases, skin manifestations of systemic disease, common infectious diseases and therapeutics, common cancers, prevention, including nutrition.

- **Block 8: Clinical Neurosciences II** (5 weeks)
  Covers advanced clinical perspective of neurology, neuropathology, psychiatry, and neuropharmacology that is coordinated with physical and psychological clinical skills development.

- **Block 9: Cardiovascular, Renal, & Respiratory Medicine II** (8 weeks)
  Pathology and pathophysiology of these systems (continued); including hypertension, developmental disorders; therapeutics - pharmaceuticals and other treatments; clinical trials and epidemiology; common cancers; common infectious agents and therapeutics; prevention.

- **Block 10: Integrative Assessment** (1 week)
  Students are provided USMLE Board review presentations on various subjects, complete the NBME Basic Science Comprehensive Exam, and must demonstrate mastery of their clinical skills by passing the OSCE (Objective Structured Clinical Examination).

Course structure: Coursework will be structured and presented in a manner to promote the integrated learning described above. Each week will have a specific "theme" and will follow a similar format. The central learning experience will be the Problem Based Learning (PBL) sessions in which a clinical case is used to explore and integrate the relevant biology as well as clinical practice and social aspects of the material for the week. Students will have been introduced to the PBL approach during Orientation Week. Sessions will be 2 hours each, twice a week, for presentation and follow up of each case. Lectures (limited to 2 hours per day) will be presented to provide background, and laboratories or other small group formats will provide additional learning experiences.

These lab/small group experiences will occur normally 3 afternoons each week. Starting with the 2nd week, one of the labs will focus on histology and pathology to develop the student's ability to visualize and integrate structure and function at all levels. Anatomy will be introduced in the first block, though the primary dissection experience will begin in Block 2. Finally, there will be additional laboratory experiences to supplement the specific themes of the week.

SKILLS COURSES: Problem Based Learning (PBL), Introduction to Physical Exam (IPE) and Doctoring are the skills courses in the first two years of medical school. Students are required to attend all sessions and must achieve a passing grade before being promoted into the clinical years. The subject content of these courses is correlated with the core lecture series topics as much as possible. For example, if the core lectures for a week are on cardiology, then the PBL case and the IPE session topics will also cover cardiology.

Problem Based Learning has been the core of clinical learning for many years. Students learn and retain better if their education involves the application of their basic science knowledge to solving a patient-based case, just as they will in the clinical years and in actual practice.

PBL cases are selected that will illustrate the clinical applications of the material being presented for that week in the core lecture series. Students are in small groups and a professor serves as a facilitator. All of the professors have read and studied the case before the student groups meet. The students are challenged to develop a differential diagnosis of the patient's problem and to become more selective as the case proceeds. They are also challenged on the meaning of various historical, physical, or laboratory findings and their significance to the case. At the end of the case, students are assigned learning issues and are asked to consult at least two references; one must be from a peer-reviewed journal and one other source.

Introduction to Physical Exam (IPE) has two parts. The first hour is a lecture on the system being covered, usually by a specialist in that field of medicine. Then the students are broken into small groups of 6 with one physician instructor and one "standardized" patient for each group. The professors meet before each

session again to ensure comparable learning objectives for the physical exam among each student group. The standardized patient, along with the physician, gives the students immediate feedback as to their performance. Students learn the basic components and how to focus a physical examination to correlate with the anatomy they are learning and according to the medical situation. Each session's topic is once again correlated with the core lecture series as much as possible.

By the end of the second year, students must demonstrate proficiency and pass a final comprehensive skills test on a 3-station objective structured clinical exam (OSCE).

Doctoring 1 has a major focus on the aspect of the doctor-patient interaction which has to do with obtaining and conveying information. Specifically:

- focus on understanding key components of the doctor-patient interaction.
- learning the essentials of obtaining and conveying information.
- using open-ended questions, empathic listening, appropriate reassurance, assessment of readiness for health behavior change, and reading of non-verbal cues.

Doctoring 2 has a focus on the aspect of more complex involvement with patients and patient's families. Specifically:

- More challenging patients with whom to interact, and more difficult information to communicate.
- In addition to collecting and recording the Subjective and Objective components of a patient interview and exam, students develop their own Assessment and Plan for the patient.

Written Formal Evaluations

- A narrative evaluation is completed by tutors twice each year
- A mid-year evaluation will be sent to students only
- An end of year evaluation "counts" i.e. goes to Student Affairs Office

Skills Courses – Evaluation: In addition to the above evaluation for Doctoring, students will also be evaluated on the basis of other performance criteria. Evaluations will be completed by the small group tutors and will include ratings on a qualitative scale in areas such as the following:

1. Problem Solving
    a. Extracts and uses the essential data in the cases
    b. Generates and evaluates appropriate hypotheses
    c. Proposes suitable courses of action.
2. Uses of Information
    a. Locates, evaluates and clearly cites appropriate information resources
    b. Synthesizes said information and relates it to the case or problem.

3. Group Process
    a. Regularly contributes resources and explanations to group discussions
    b. Works cooperatively and respectfully with members of the group.
4. Clinical Skill Set
    a. patient interviews and physical diagnosis performed within the group setting.

Students will also be expected to evaluate their own progress, identify areas of deficiency (in both their individual approaches to learning and in their group interactions), and propose a plan to improve in identified areas of weakness.

Examinations: Every block will conclude with the following:

- A comprehensive final exam integrating all aspects of the course. This may include a laboratory practical component that is appropriate to the objectives of the course. The passing grade of the final exam of each course will be established in advance by its course chairs.

- Individual clinical skill assessment (*e.g.* patient interviewing or physical examination). It is expected that the students' skills will grow throughout the year. Criteria for acceptable performance in each course will increase as the year progresses, and will be published in advance.

To pass the blocks, a student must meet the passing criteria of both of the above. In addition, there will be weekly "self-assessments" (i.e. quizzes with scores that are not factored into the student's final grade). Their primary purpose is to provide a "low stakes" method that will allow students to evaluate progress and will allow faculty to identify students who may need individual assistance. In order to accomplish these purposes, students are expected to complete each quiz in the prescribed timeframe and are taken on-line. Students are required to complete every assessment; otherwise they are liable to receive a grade of Incomplete for the course.

Block 1 - Foundations of Medicine

Course Description:

- Surveys principles of genetics, and molecular, cellular and developmental biology in relation to human disease processes. Coverage includes basics of cell cycle regulation, gene expression, protein processing, signal transduction, ion transport and action potentials, genetics, embryology, cancer biology, immunology and pharmacology. Laboratory sessions provide an overview of cell structure and tissue organization along with thematically relevant concepts of histopathology.

Course Objectives:

- Understand the principles of medical genetics, including single gene inheritance, genetic contribution to causation of common diseases, chromosomal abnormalities, and DNA-based diagnosis of genetic diseases.
- Learn the elements of human embryology.
- Understand the principles of cell biology, cell physiology, and molecular biology, including cell structure and function, signal transduction, regulation of the cell cycle, regulation of gene expression, protein translation and processing, transport pathways, and electrophysiology.
- Master the basic concepts of histology and histopathology, including organization of cells in tissue, blood cell types, cell injury and cell death, and the pathology of neoplasia and inflammation.
- Understand the basics of cancer biology, including mechanisms underlying malignant transformation and metastasis of cancer cells.
- Understand the principles of immunology at the cellular and molecular level.
- Master the basics of molecular pharmacology, including pharmacokinetics and pharmacodynamics, drug efficacy and potency, agonists and antagonists, synaptic pharmacology, drug action on ion channels, and pharmacogenetics.
- Learn how to interview a patient and prepare a case history.

Course Organization:

- Students will have a maximum of 10 hours of didactic lecture instruction each week.
- Students will participate in one or two laboratory exercises each week which illustrate key principles provided in classroom lectures.
- Groups of 6 - 8 students will meet each week for Problem-Based Learning with a faculty or clinician facilitator; this group will remain together throughout the block.
- A different group of 6 - 8 students will meet every other week for Doctoring sessions with a physician facilitator and psychologist/social worker as a tutor, this group will remain together throughout the block.

- Every other week, students will participate in clinical skills training experiences in small groups with clinicians and standardized patients.
- Once each month, each student will meet with his/her preceptor and shadow this physician in his/her medical office, clinic or on hospital rounds.
- Students will complete on-line assessments each week.
- Students will take a comprehensive final exam at the end of the block, a laboratory practical exam, as well as be evaluated for clinical skills competency.

Week 1

How does one's genetic makeup establish biologic individuality, with its associated possibilities and limitations?

Day	# Hours	Topic	Faculty
1	1	Course Introduction	Straus / DeFea
	1	Epidemiology of Disease	Vadheim
	1	Chromosomes, Meiosis, Gamete Formation, Fertilization	Straus
	1	PBL: pre-session	Horstmann / DeFea / Harris
	2	PBL: "Major Anemia, Major Dilemma"	Horstmann / DeFea / Harris
2	1	Patterns of Single Gene Inheritance	Straus
	1	Gene Expression	Sladek
	2	Histology: Cell Structure	DeFea
3	1	Protein Translation	DeFea
	1	Posttranslational Modification	DeFea
	3	Doctoring: Course Introduction/ Ethical Foundations	Doctoring Staff
4	1	Linkage & Recombination, Human Gene Mapping	Straus
	1	Hemoglobin Disorders, Molecular Diagnostics	Straus
	2	Molecular Diagnostics Workshop	Straus
5	2	PBL: Journal Club Presentation and Case Discussion	Horstmann / DeFea / Harris
	1	Disease and Genetics of Complex Traits	Straus
	1	Introduction to Clinical Problem Solving	Shankel
	1	Weekly Wrap-up: Thinking Beyond the Case	Gamal / Straus

Week 2

How does a single-celled fertilized egg develop into a highly complex adult body having billions of variously differentiated cells?

Day	# Hours	Topic	Faculty
1	1	Cytogenetics-I	Straus
	1	Cytogenetics-II	Straus
	1	PBL pre-session	Horstmann / DeFea / Harris
	1.5	Small Group PBL: "A Bad Case of Acne"	Horstmann / DeFea / Harris
	2	Biomath/Statistics, Basic Probability & Statistics	Vadheim
2	1	Mechanisms of Signal Transduction I	DeFea
	1	Early Embryology, Germ Layers, and Morphogenesis	Garabedian
	1	Cell Differentiation, Induction, and Stem Cells	Garabedian
	2	Cytogenetics Lab	Straus
3	1	Mechanisms of Signal Transduction II	DeFea
	1	HOX Genes and the Body Plan	Garabedian
	3	Clinical Skills: Interviewing Techniques; Practice Interviewing & Chart Notes	Clinical Skills Staff
4	1	Overview: Fetus through Neonate	Garabedian
	2	Embryology Lab	Garabedian
5	2	PBL	Horstmann / DeFea / Harris
	1	Cell Cycle I	Straus
	1	Cell Cycle II and Apoptosis	Straus / D.Ethell
	1	Weekly Wrap-up: Thinking Beyond the Case	Brar / Straus

Week 3

How do cells regulate their internal and external environments to form stable tissues, yet ultimately die?

Day	# Hours	Topic	Faculty
1	1	Epithelial Cell Biology	Walker
	1	Connective Tissue, Extracellular Matrix I	Walker
	1	PBL: pre-session	Horstmann / DeFea / Quinton
	1.5	PBL: "The Leaking Lung"	Horstmann / DeFea / Quinton
	1	Biomath/Statistics Intro. to Interpreting Published Studies	Vadheim
2	1	Membrane Potentials and Transport	Buehler
	1	Connective Tissue , Extracellular Matrix II; Adaptation to Injury	Walker
	2	Blood Drawing, Slide Preparation & Staining	Lytle / Shankel
3	1	Classes of Membrane Transport	Lytle
	1	Cytoskeleton and Cell Motility	DeFea
	3	Clinical Skills: Practice Interviewing and Chart Notes, Case Presentations	Clinical Skills Staff
4	1.5	Cell Injury and Adaptation I	Atkinson
	1.5	Cell Injury and Adaptation II	Atkinson
	2	Histology Lab: Skin	Walker
5	1	PBL	Horstmann / DeFea / Quinton
	1	Biology of Aging	Spindler
	1	Weekly Wrap-up: Thinking Beyond the Case	Quinton / Straus

Week 4

How do cells spontaneously escape normal regulatory mechanisms to replicate uncontrollably, grow into adjacent tissues, and spread to distant organs?

Day	# Hours	Topic	Faculty
1	1	PBL: pre-session	Horstmann / DeFea / Luben
	2	PBL: "Mary's Mole"	Horstmann / DeFea / Luben
2	1	Cancer Genetics and Molecular Biology I	Straus
	1	Cancer Genetics and Molecular Biology II	Straus
	1	Cancer Biology	Atkinson
	2	Histopathology Lab: Cancer/Skin	Atkinson
3	1.5	Cancer Diagnosis and Management	Howard
	1.5	Cancer Information Resources Lab	Howard
	3	Doctoring: Child with cancer	Doctoring Staff
		Cancer Survivor Panel	
4	1	Cancer Genetics and Molecular Biology III	Straus
	1	Cancer Genetics and Molecular Biology IV	Straus
5	2	PBL	Horstmann / DeFea / Luben
	1	Cancer Genetics and Molecular Biology V	Straus
	1	Weekly Wrap Up: Thinking Beyond the Case	Howard / Straus

Week 5			
How do cells generate and utilize energy to perform specialized functions?			
Day	# Hours	Topic	Faculty
1	1	Excitable Cells	Buehler
	1	Ionic Mechanisms	Buehler
	1	PBL pre-session	Horstmann / Straus / Harris
	2	PBL: "Mickey's Impressive Marathon"	Horstmann / Straus / Harris
2	1	Voltage-Gated Channels	Buehler
	1	Action Potentials I	Buehler
	2	Histopathology Lab: Cell Injury	Atkinson
3	1	Action Potentials II	Buehler
	2	Nerve Program 1--The Nerve Impulse; also, lab on Excitable Cells	Buehler
	3	IPE: Intro to Physical Exam/Blood Pressure, Vital Signs, skin exam/ Diagnostic Equipment	IPE Staff
4	1	Evidence Based Medicine	Loo
	1	Mitochondria and Cell Energy Maintenance	DeFea
	1	Cell Signaling, Neurosecretion	DeFea
	1	Cell Volume Regulation	Lytle
5	2	PBL	Horstmann / Straus / Harris
	2	Chaplain Rounds- Introduction	Chaplain
	1	Weekly Wrap Up: Thinking Beyond the Case	Shankel / DeFea

Week 6			
How does the body protect itself and respond to injury?			
Day	# Hours	Topic	Faculty
1	1	Battling the Enemy: A Brief Introduction to Microbial Pathogens	Schiller
	1	Introduction to Blood	DeFea
	1	PBL pre-session	Horstmann / Straus / Schiller
	2	PBL: "So Many Infections"	Horstmann / Straus / Schiller
2	2	Blood Lab	Ibrahim
	1	Introduction to Inflammation	Atkinson
	1	Phagocytes	Atkinson
3	1	Lipid Mediators	Carson
	1	Plasma, Cascades, Contact Activation, Complement, Inhibitors	Carson
4	1	Cytokines, Chemokines, Regulation of Inflammation	Carson
	1	Innate Immunity and Initiation of Inflamation	Atkinson
	2	Histopathology Lab: Acute Inflammation	Atkinson
5	2	PBL	Horstmann / Straus / Schiller
	1	Chronic and Granulomatous Inflammation	Atkinson
	1	Tissue Repair and Fibrosis	Atkinson
	1	Weekly Wrap Up: Thinking Beyond the Case	Atkinson / Larson / DeFea

Week 7			
How does the body recognize self from non-self and protect itself from invading microorganisms?			
Day	# Hours	Topic	Faculty
1	1	Overview of the Immune System	Carson
	1	Anatomy and Development of Immune System	Walker
	1	PBL pre-session	Horstmann / Straus / Harris
	2	PBL: Mr. Love's Cough	Horstmann / Straus / Harris
2	1	Antigens and the B Cell: Molecules that Recognize Them	Carson
	1	Antigens and the T Cell: Molecules that Recognize Them	Carson
	2	Histopathology Lab: Chronic and Granulomatous Inflammation	Atkinson
3	1	Major Histocompatibility Molecules & Antigen Processing	Carson
	1	IG vs. T Cell Mediated Damage	Carson
	3	Doctoring: Homeless Family, TB risk, Immunizations	Doctoring Staff
4	1	Titrating Non-Self vs. Self Recognition; Hypersensitivity and Autoimmunity	Carson
	1	Immunodeficiency and the Concept of Vaccination	Carson
	2	Immunology Lab	Carson
5	2	PBL Wrap-up	Horstmann / Straus / Harris
	1	Immune Response to Microbial Pathogens	Carson
	1	Transplantation	Carson
	1	Weekly Wrap Up: Thinking Beyond the Case	Larson / Straus

Week 8			
How can our knowledge of basic cellular and disease processes be used to develop novel diagnostic tests and therapeutics?			
Day	# Hours	Topic	Faculty
1	1	Principles of Pharmacology I	Johnson
	1	Principles of Pharmacology II	Johnson
2	1	Pharmacological Intervention: Anti-Inflammatories	Byus
	1	Pharmacological Intervention: Anti-Neoplastics	Byus
	2	Histopathology Review	Atkinson
3	1	Mutations; animal models of disease	Straus
	1	Pharmacogenetics; gene therapy	Straus
	2	Doctoring: Chronically Ill Children/ Parents Panel	Doctoring Staff
4	1	Principles of Pharmacology III	Johnson
	1	Health Care Financing and Equitability	Shankel
	3	Doctoring: Clinical Preceptor Visit #1	Doctoring Staff
5		Preparation for Exams	

Week 9			
Integrated Examination Period			
Day	# Hours	Topic	Faculty
1	3	Final Exam pt. I, Multiple Choice	Block Faculty
2	3	Final Exam pt. II, Lab Practical	Block Faculty
3	3	Final Exam pt. III, Patient Interview	Doctoring Staff

Block 2 - Cardiovascular, Renal and Respiratory Medicine I

Course Description:

- Surveys the organization and integrative operation of the cardiovascular, renal, respiratory and autonomic nervous systems and their responses to stress and disease. Selected laboratory exercises demonstrate key principles of electrocardiography, blood pressure regulation, renal function, body fluid composition and volumes, and pulmonary function. Laboratories emphasize methods for measuring cardiac, pulmonary and renal function.

Course Objectives:

- Introduce basics of the cardiovascular, renal, respiratory, and autonomic nervous systems and their responses to stress and disease.
- Integrate biology with applied aspects of medicine (pathologic processes, healthcare delivery, doctoring skills, etc).
- Emphasize understanding and application of knowledge to problems over memorization.

Course Organization:

- Students will have a maximum of 10 hours of didactic lecture instruction each week.
- Students will participate in one or two laboratory exercises each week which illustrate key principles provided in classroom lectures.
- Groups of 6 - 8 students will meet each week for Problem-Based Learning with a faculty or clinician facilitator; this group will remain together throughout the block.
- A different group of 6 - 8 students will meet every other week for Doctoring sessions with a physician facilitator and psychologist/social worker as a tutor, this group will remain together throughout the block.
- Every other week, students will participate in clinical skills training experiences in small groups with clinicians and standardized patients.
- Once each month, each student will meet with his/her preceptor and shadow this physician in his/her medical office, clinic or on hospital rounds.
- Students will complete on-line assessments each week.
- Students will take a comprehensive final exam at the end of the block, as well as a laboratory practical exam.

Week 1			
Dyspnea and exchange of gases between atmosphere & blood			
Day	# Hours	Topic	Faculty
1	1	Design and Functional Organization of the Cardiovascular System	Lytle
	1	Cardiac Electrophysiology I (cellular level)	Lytle
	2	PBL Case #1 Intro	Ruiz / Lytle / Baker
2	1	Organization & Functions of the Autonomic Nervous System	Baker
	1	Cardiac Electrophysiology II (organ level)	Lytle
	1	Thoracic Wall	Colgan
	1	Anatomy of Heart and Great Vessels	Colgan
	2	Gross Anatomy of Heart and Middle Mediastinum 1: Pleural Cavity (Lab)	Colgan / Baker
3	1	Skeletal Muscle	DeFea
	1	Principles of Smooth/Cardiac Muscle	Walker
	3	Clinical Skills: Cardiac/Peripheral Vasculature	Van Holten and Staff
4	1	Basics of the Electrocardiogram	Lytle
	1	Autonomic Pharmacology: Regulation of Heart Rate & Blood Pressure	Johnson
	3	EKG and Heart Sounds Lab	Lytle
5	2	PBL Case #1 Wrap-Up	Horstmann / Lytle / Baker
	1	Adrenergic Pharmacology Principles	Johnson
	1	Cholinergic Pharmacology Principles	Johnson
		Preceptor Visit Opportunity	

Week 2			
The cardiac pump and regulation of its rate			
Day	# Hours	Topic	Faculty
1	1	Heart as a Pump and Cardiac Cycle	Lytle
	1	Factors Determining Stroke Volume and Pressure: Preload, Afterload & Contractility	Lytle
	1.5	PBL Case #2 Intro	Horstmann / Lytle / Shyy
	1.5	Critical Thinking Skills: Evaluating diagnostic tests	Vadheim
2	1	Factors Determining Preload	Lytle
	1	Hemodynamics	Lytle
	2	Gross Anatomy of Heart and Middle Mediastinum 2: Heart (Lab)	Colgan / Baker
3	1	Regulation of Peripheral Flow	Lytle
	1	Blood Pressure Regulation I: Receptors & Reflexes	Lytle
	3	Doctoring: "Chest Pain"	Jafri and Staff
4	1	Blood Pressure Regulation II: Integrated Responses	Lytle
	1	Lecture: Histopathology of Cardiovascular System	Walker
	2	Lab: Histopathology of Cardiovascular System	Walker & Atkinson
5	2	PBL Case #2 Wrap-Up	Ruiz / Lytle / Shyy
	1.5	Coronary Circulation & Cardiac Metabolism	Lytle
	1	PBL "Week-In-Review": Related Cases Preceptor Visit Opportunity	Marais

Week 3			
Regulation of blood flow and blood pressure			
Day	# Hours	Topic	Faculty
1	1.5	Regional Circulations: Pulmonary, Skeletal, & Fetal	Lytle
	1.5	PBL Case #3 Intro	Ruiz / Lytle / Shyy
	1.5	Critical Thinking Skills: Evaluating therapeutic options	Vadheim
2	1	Lecture: Lungs and Pleural Cavities	Colgan
	3	Lab: Lungs and Pleural Cavities	Colgan / Baker
3	1	Preload, Afterload & Contractility of the Failing Heart	Lytle
	1	Electrocardiographic Assessment of Heart Disease	Lytle
4	2	Case Studies: Clinical Assessment of Shock	Bolger
	0.5	Cardiac Assessment by Imaging & Catheterization	Bolger
	0.5	Hemodynamics of Valvular Heart Disease (Stenosis & Regurgitation)	Bolger
5	2	PBL Case #3 Wrap-Up	Ruiz / Lytle / Shyy
	1	Capillary Exchange, Circulation of Extracellular Fluid, Edema	Lytle
	2	Case Studies: Heart Disease Scenarios and Therapeutic Options	Krishnan
		Preceptor Visit Opportunity	

Week 4			
Myocardial infarction, valve disease and heart failure			
Day	# Hours	Topic	Faculty
1	2	Intro: Structure & Function of the Renal System	Walker
	1	Body Fluid Compartments	Quinton
	2	PBL Case #4 Intro: Patient with Diabetes Insipidus	Serros / Quinton / Baker
2	1	Glomerular Filtration and its Assessment	Quinton
	1	Proximal Tubule: Modification of Filtrate	Quinton
3	1	Distal Nephron: Formation of Hypotonic and Hypertonic Urine	Quinton
	1	H_2O Homeostasis-- Regulation of Osmolality, [Na+], and Cell Volume	Quinton
	2	Doctoring: Elderly patient with aortic stenosis (to operate or not?)	Jafri and Staff
4	2	PBL Case #4 Wrap-Up: Patient with Diabetes Insipidus	Serros / Quinton / Baker
	1	Sodium Homeostasis--Regulation of Effective Circulating Volume	Quinton
	1	Case Studies: Diuresis	S. Shankel

Week 5			
Renal regulation of salt and water			
Day	# Hours	Topic	Faculty
1	1	Introduction to Disorders of Fluid Balance	S. Shankel/Bricker
	1	Potassium Homeostasis	Quinton
	1.5	PBL Case #5 Intro: Patient with Diabetic Ketoacidosis "Not Happy Camper"	Serros / Lytle / Quinton
	1.5	Critical Thinking Skills: More on diagnosis	Vadheim
2	1	Renal Mechanisms in Acid-Base Homeostasis	Quinton
	2	Dry Lab - Renal Conference I: Disorders of Water Balance, Hypo-/Hypernatremia	Quinton
3	1	Lecture: Structure and Histopathology of Renal System	Walker
	2	Structure and Histopathology of Renal System	Walker
	3	Clinical Skills: Respiratory Exam	Van Holten and Staff
4	1	Acid-Base Physiology	Lytle
	1	Acid-Base Disorders	Lytle
5	2	PBL Case #5 Wrap-Up	Serros / Lytle / Quinton
	2	Renal Conference II: Disorders of Potassium & Acid-Base Balance	S. Shankel / Bricker

Week 6			
Renal regulation of salt and water			
1	1	Acid-Base: Integrated Responses	Lytle
	1	Chronic Renal Failure--An introduction	S. Shankel / Bricker
	1	Research on Cellular Pathophysiology of Glomerulopathy	S. Shankel / Bricker

Week 7			
Acid-base balance; renal failure			
Day	# Hours	Topic	Faculty
1	2	PBL Case #6 Intro: Patient with chronic dyspnea & cough	Horstmann / Quinton / Lytle
	1	Design and Organization of Respiratory System	Walker
	1	Lecture: Histopathology of the Respiratory System	Walker
	2.5	Lab: Histopathology of the Respiratory System	Walker / Atkinson
	1.5	Lab: Histopathology of the Renal System	Atkinson
2	1	Mechanical Properties of Lungs, Diaphragm and Chest	Quinton
	1	Perfusion of the Lungs	Quinton
		Preceptor Visit Opportunity	
3	1	Ventilation & Gas Exchange	Quinton
	1	Intro to Diseases of Respiratory System	T. Shankel
	3	Doctoring: COPD and Smoking Cessation	Jafri and Staff
		Preceptor Visit Opportunity	
4	1	Diffusion and Blood Gas Transport	Quinton
	1	Matching Ventilation and Lung Perfusion	Quinton
	2	LAB : Pulmonary Physiology: Spirometry Lab	Quinton
5	2	PBL Case #6 Wrap-Up: Patient with chronic dyspnea & cough	Horstmann / Quinton / Lytle
	1	Lecture: Posterior Mediastinum	Colgan
	2	Lab: Posterior Mediastinum	Colgan / Baker
	1	Case Studies: Causes of Dyspnea	Dr. Roger Seheult
	1	PBL "Week-In-Review": Related Cases	Dr. Roger Seheult

Week 8			
Pulmonary edema and respiratory failure			
Day	# Hours	Topic	Faculty
1	1	Lecture - Control of Breathing – Mechanisms	Quinton
	1	Mechanisms of Hypoxemia	Quinton
	1	Pathology of Acute Lung Injury and Hypoxemic Respiratory Failure (ARDS)	Sheldon
	2	PBL Case #7 Intro: "Walking a Block"	Dexter / Quinton / Luben
2	1	Lecture - Control of Breathing – Applications to Exercise and Acid-Base Balance	Quinton
	3	LAB - Pulmonary Physiology, Cardiopulmonary Exercise Testing; Control of Breathing	Quinton
3	1	Perinatal Development & Biology of Respiratory System; Surfactant	Walker
	1	COPD and Hypercapnic Respiratory Failure	Sheldon
	2	Clinical Skills-- Review Preceptor Visit Opportunity	Van Holten and Staff
4	1	Pulmonary Diagnostic Techniques	Sheldon
	1	Interstitial Lung Disease	Sheldon
	1	Integration of Pulmonary Exam, Anatomy, Physical Exam, and Radiology	Sheldon
5	2	PBL Case #7 Wrap-Up	Dexter / Quinton / Luben
	1	PBL "Week-In-Review": Related Cases	Fargo

Week 9			
Integration and Application			
Day	# Hours	Topic	Faculty
1	1	Principles of Translational Research	Luben
	1	Critical Thinking Skills: Intro to Controlled Clinical Experiments/Randomized controlled blinded clinical trials	Vadheim
2	1	Organ System Capacities over the Lifespan	Baker
	1	Body Temperature, Temperature Regulation and Fever	Baker
	1	Acute and Chronic Congestive Heart Failure: Body Fluids & the Lungs	Panel: Belperio, Tillisch, Tormey
	2	Review and Case Studies--Organ Systems Failure Lecture/Tutorial	S. Shankel
3	1	Organ System Failure: Common Motifs and Differences	Jafri
	1	Fitness in Health and Disease	Baker
	3	Patient Exam	Van Holten and Staff
4	1	Patient Centered Health Care - Review	S. Shankel
	2	Critical Thinking Skills: Design of controlled, non-randomized clinical experiments (Cohort design)	Vadheim
	2	Critical Thinking Skills: Applying results of clinical trials to patients/Intro to clinical decision-making	Vadheim
5	1	PBL "Week-In-Review": Related Cases	S. Shankel

Week 10			
Integrated Examination Period			
Day	# Hours	Topic	Faculty
		Timed exam (~110 multiple choice questions)	Lytle/Quinton/Johnson/Baker
		Anatomy/Histology/Pathology Practical Exam with integrative problems	Colgan/Walker/Atkinson

Block 3 - Gastrointestinal, Endocrine and Reproductive Health I

Course Description:

- Surveys gastrointestinal physiology, medical biochemistry and molecular endocrinology (with an emphasis on metabolic disorders and human nutrition). Coverage includes anemia, clotting disorders, hepatitis, alcoholic cirrhosis, diabetes, celiac ciseases, osteoporosis, diseases of steroid metabolism, reproductive disorders, thyroid disorders, pituitary disorders, and pharmacokinetics. Gross anatomy lectures and laboratories cover upper and lower GI tract, abdominal cavity wall, the pelvis and perineum.

Course Objectives:

- Become familiar with the normal anatomy, histopathology, biochemistry, physiology, and endocrinology of the gastrointestinal system, the liver, the endocrine system, the reproductive system, and the skeletal system.
- Understand how disease processes may affect the above systems and how these diseases can be diagnosed and treated.
- Learn how to locate, interpret, and present literature on these disease processes in problem-based learning and clinicopathological conferences.
- Gain experience in patient examination and doctoring related to diseases of the above systems.
- Understand the societal impacts of metabolic, sexual and reproductive variations through discussions with patients and community members.

Course Organization:

- Students will have a maximum of 10 hours of didactic lecture instruction each week.
- Students will participate in one or two laboratory exercises each week which illustrate key principles provided in classroom lectures.
- Groups of 6 - 8 students will meet each week for Problem-Based Learning with a faculty or clinician facilitator; this group will remain together throughout the block.
- A different group of 6 - 8 students will meet every other week for Doctoring sessions with a physician facilitator and psychologist/social worker as a tutor, this group will remain together throughout the block.
- Every other week, students will participate in clinical skills training experiences in small groups with clinicians and standardized patients.
- Once each month, each student will meet with his/her preceptor and shadow this physician in his/her medical office, clinic or on hospital rounds.
- Students will complete on-line assessments each week.
- Students will take a comprehensive final exam at the end of the block, a laboratory practical exam, as well as be evaluated for clinical skills competency.

Week 1			
Hepatitis and Blood Clotting Themes			
Day	# Hours	Topic	Faculty
1	0.5	Orientation and Introduction	Luben / Shyy
	1	Case introduction: Acute Hepatitis	Huang
	1	Anatomy lecture: Abdominal Wall	Colgan
	2	Tutorial: Nutrition Assessment	Bowen
2	1	Liver Functions: Basic Science Overview	Luben
	1	Anatomy lecture: Upper GI Tract	Colgan
	3	Anatomy Lab: Upper GI Tract	Colgan / Baker
3	1	Liver Biochemistry: Heme and Bilirubin	Luben
	1	Physiology: GI Motility	Lytle
	3	Doctoring: Small Group Case: Young Adult Health Risk Assessment	Jafri and Staff
4	1	Gastric Secretion	Lytle
	1	The Liver and Blood Clotting #1: Biochemistry	Luben
	1	Liver Detoxification of Alcohol, Ammonia, and Drugs	Luben
	4	Histopath Lecture/Lab: Upper GI and Associated Glands	Walker / Atkinson
5	0.5	PBL Facilitator Pre-session	Lytle / Straus / Shah
	1.5	PBL Case #1: The Infant who Failed to Grow	Lytle / Straus / Shah
	1	Sexual history taking	Sinkhorn
	1	CPC #1: Anemia	Ibrahim

Week 2			
GI - Diarrhea Theme			
Day	# Hours	Topic	Faculty
1	1	Pancreatic Secretion	Lytle
	1	The Liver and Blood Clotting #2: Clinical Tests	Ibrahim
	1	Anatomy Lecture: Lower GI Tract	Colgan
	3	Anatomy Lab: Lower GI Tract	Colgan / Baker
2	1	CPC #2: Alcoholic Cirrhosis	Horstmann
	1	Bile Secretion & Fat Assimilation	Lytle
	1	Carbohydrate & Protein Assimilation	Lytle
	3	IPE: Clinical Skills Lab: Intro to the abdominal exam	Van Holten and Staff
3	1	GI Fluid & Electrolyte Transport	Lytle
	1	Diarrhea/Pediatric Diarrhea	Mishra
	4	Histopath Lecture/Lab: Lower GI and Associated Glands	Walker / Atkinson
4	1.5	PBL #1: The Infant Who Failed to Grow, Part 2	Lytle / Straus / Shah
	1	Development of the GI Tract	Colgan
	1	Abdominal Pain	Thiruvengadam

Week 3			
Diabetes/Obesity Theme			
Day	# Hours	Topic	Faculty
1	1	Case Introduction: Diabetes Mellitus (Including epidemiology & pathophysiology)	Firek
	1	Biochemistry: Carbohydrate and Fuel Metabolism	Luben
2	1	Biochemistry: Actions of Insulin, Glucagon, etc.	Luben
	1	Lipid: Structures, properties, and transport in Blood	Shyy
	4	Histopath Lecture/Lab: Endocrine Pancreas, Pituitary, Thyroid	Defea / Atkinson
3	1	Biochemistry: Type 1 and Type 2 Diabetes	Luben
	1	Lipid Deposition and Mobilization	Shyy
	3	Doctoring: Small Group Case: Diabetic Patient	Jafri and Staff
4	1	Biochemistry and Endocrinology of Obesity	Luben
	1	Diabetes Drugs: Biochemistry and Physiology Preceptor Visit Opportunity	Luben
5	0.5	PBL Facilitator Pre-session	Shyy / Luben / Dixon
	1.5	PBL Case #2: The Neonate with Multiple Problems, Part 1	Shyy / Luben / Dixon
	1	Energy balance; Beta-oxidation vs. Biosynthesis of Fatty Acids	Shyy

Week 4			
Diabetes/Obesity Theme			
Day	# Hours	Topic	Faculty
1	1	Cholesterol Biochemistry	Shyy
	1	Group presentation: Obesity	Shyy
	2	Critical Thinking Skills	Vadheim
2	1	Prostaglandins and Leukotrienes	Byus
	1	Oxidative Phosphorylation	Norman
	1	Phospholipids-synthesis & function	Shyy
		Preceptor Visit Opportunity	
3	3	Doctoring Small Group: Follow-up visit and diet consultation with diabetic patient	Jafri and Staff
4	1	Lysosomal Disorders	Walker
	1	Bile Acids and Statins	Shyy
	3	Genetics: Group Discussion - Complex Diseases/Diabetes	Straus
5	1.5	PBL Case #2: The Neonate with Multiple Problems, Part 2	Luben / Shyy / Dixon
	1	Wrap-up: Diabetes & Obesity	Shyy

Week 5			
Metabolic Diseases			
Day	# Hours	Topic	Faculty
1	1	Amino Acid & Protein Metabolism	Luben
	1	Signs & Symptoms Approach to Inborn Errors of Metabolism	Abdenur
	2	Critical Thinking Skills	Vadheim
2	1	Gout, Purine Synthesis, Pyrymidine Synthesis	Byus
	1	Chemotherapeutic Drugs, Folate Metabolism	Byus
	3	Histopath Lab: Parathyroid, Adrenal Cortex	Defea, Atkinson
3	1	Pituitary Hormones	Luben
	1	Steroid Hormones	Norman
4	1	Diseases of Steroid Metabolism	Norman
	1	CPC #4: Hyperadrenocorticalism	Shankel
		Preceptor Visit Opportunity	
5	0.5	PBL Facilitator Pre-Session	Luben / Norman / Horstmann
	1.5	PBL Case #3: The Unexpected Fall, Part 1	Luben / Norman / Horstmann
	1	Purines & Immunodeficiency Diseases	Carson

Week 6			
Osteoporosis and Bone Diseases			
Day	# Hours	Topic	Faculty
1	1	Female Reproductive Physiology: Menstruation/Pregnancy#1	Defea
	1	Development of Bone & Cartilage, Morphology of Joints	Walker
	4	Histopath Lecture/Lab: Female Reproductive System	Defea / Atkinson
2	1	Growth and Repair of Bone	Walker
	1	Diseases of Calcium Metabolism, Calcium Signaling	Firek
	1	Clinical Case Presentation: Osteoporosis	Firek
	4	Histopath Lecture/Lab: Bone and Bone Tumors	Walker / Atkinson
3	1	Parathyroid /Calcium Metabolism, PTH, Calcitonin, Vitamin D	Norman
	1	Menstruation/Pregnancy#2	Defea
4	1	Thyroid Hormone Synthesis	Shyy
	1	Hyperthyroidism, hypothyroidism, and Goiter	Murdoch
	1	CPC #7: Thyroid Disorder	Murdoch
	4	Pharmacokinetics	Byus
5	1.5	PBL Case #3: The Unexpected Fall, Part 2	Luben / Norman / Horstmann
	1	Rheumatology I	Gordon
	1	Rheumatology II	Gordon
	1	Wrap-up/Clinical Reasoning:	Gordon
	1	Pituitary Growth Problems In Children	Clark
	1	Ambiguous Genitalia	Clark
	1	CPC #6: Precocious Puberty Thinking Beyond the Case	Clark

Week 7			
Reproduction and Infertility			
Day	# Hours	Topic	Faculty
1	1	Clinical Case Presentation: Infertility	Sinkhorn
2	1	Reproductive Physiology	Byus
	3	IPE: Male GU Exam	Van Holten and Staff
3	1	Anatomy Lecture: Posterior Abdominal Wall and Pelvis 1	Colgan
	3	Anatomy Lab:Posterior Abdominal Wall and Pelvis 1	Colgan, Baker
4	0.5	PBL Facilitator Pre-session	Walker / Byus / Sinkhorn
	1.5	PBL Case: Abdominal Pain, Part 1	Walker / Byus / Sinkhorn
	1	Menopause and Hormone Therapy	Sinkhorn
	1	Wrap-up/Clinical Reasoning	Sinkhorn

Week 8			
Reproduction and Infertility			
Day	# Hours	Topic	Faculty
1	1	Lesbian, Gay, Bisexual and Transgender issues	LGBT Center
	1	Anatomy Lecture:Pelvis 2 and Perineum	Colgan
	3	Anatomy Lab: Pelvis 2 and Perineum	Colgan / Baker
2	2	Integrated Breast Exercise: Phys. Exam, Pathology, Radiology	Taurek
	1	CPC #7: Methotrexate Therapy	Finley
3	2	Anatomy Review	Colgan / Baker
	1	Micturition and Urinary Incontinence	Torrey
	3	Doctoring: Teen Counseling	Jafri and Staff
4	1	Development of the GU System	Colgan
	1	Male Reproductive Physiology	Defea
	3	Histopath Lab: Male Reproductive System	Defea, Atkinson
5	1.5	PBL Case #4: Abdominal Pain, Part 2	Walker / Byus / Sinkhorn

Week 9			
Integrated Examination Period			
Day	# Hours	Topic	Faculty
1	3	Multiple Choice Final Exam	
2	2	Anatomy lab exam	
	2	Histopath Exam	
3	3	Patient Interview	

Block 4 - Musculoskeletal Medicine

Course Description:

- Covers the structures and functions of the peripheral nervous and musculoskeletal systems with a strong clinical emphasis. Students learn how the brain and spinal cord receive sensory input, and control skeletal muscle, and are introduced to neurology. Gross anatomy lectures and laboratories focus on the upper and lower extremities.

Course Objectives:

- Learn the structure, function and pathology of the neuromuscular junction.
- Identify the major motor and sensory pathways in the CNS and understand their role in motor control and sensory processing.
- Integrate motor and sensory functions of the spinal cord with limb structure and function. Understand the consequences of injury to the spinal cord and limbs as a basis for identifying the site of injury in cases involving trauma or vascular injuries.

Course Organization:

- Students will have a maximum of 10 hours of didactic lecture instruction each week.
- Students will participate in one or two laboratory exercises each week which illustrate key principles provided in classroom lectures.
- Groups of 6 - 8 students will meet each week for Problem-Based Learning with a faculty or clinician facilitator; this group will remain together throughout the block.
- A different group of 6 - 8 students will meet every other week for Doctoring sessions with a physician facilitator and psychologist/social worker as a tutor, this group will remain together throughout the block.
- Every other week, students will participate in clinical skills training experiences in small groups with clinicians and standardized patients.
- Once each month, each student will meet with his/her preceptor and shadow this physician in his/her medical office, clinic or on hospital rounds.
- Students will complete on-line assessments each week.
- Students will take a comprehensive final exam at the end of the block, an anatomy lecture and lab exam, and a clinical skills assessment of the lower extremeties.

Week 1			
Neuromuscular disorders; spinal cord and back anatomy			
Day	# Hours	Topic	Faculty
1	0.5	Introduction to Block 4	Colgan / Baker
	1	PBL pre-session	PBL Team
	1.5	PBL Case Initial Presentation "A Woman's Ordeal"	PBL Team
	2	Histopathology Lab: Motor-Muscle Muscular Dystrophy	Atkinson
2	1.5	Neuromuscular Junction - Physiology and Pharmacology	Johnson
	2	Vertebral Column and Back	Colgan
	3	Superficial Back - Anatomy Lab	Colgan / Baker
3	1	Spinal Cord	Colgan
	1	Lower Motor Neuron	D. Ethell
	3	Lower Back/Lumbar Puncture	Van Holten and Staff
4	1	Neuromuscular Disorders 1	Rai
	1	Neuromuscular Disorders 2	Rai
	1	Shoulder Region	Colgan
	3	Lab: Spinal Cord and Shoulder Region	Colgan / Baker
5	3	EMG Lab	Rai
		Preceptor Visit Opportunity	

Week 2			
Cytology and embryology of the nervous system; upper limb innervation			
Day	# Hours	Topic	Faculty
1	1	PBL Wrap-up	PBL Team
	2	Neurocytology 1: Lecture	I. Ethell
	3	Neurocytology 1: Lab	I. Ethell
2	1	Sensory Receptors	I. Ethell
	1	Axilla and Brachial Plexus: Lecture	Colgan
	3	Axilla and Brachial Plexus: Lab	Colgan / Baker
3	1	Embryology of CNS	D. Ethell
	1	Ventricles and CSF	Baker
	3.5	Doctoring: Patient with Disabilities	Jafri and Staff
4	2	Thinking Beyond the Case: Differential Diagnosis Nerve and Muscle Disease	Rai
	1	Arm and Cubital Fossa: Lecture	Colgan
	3	Arm and Cubital Fossa: Lab	Colgan / Baker

Week 3			
Peripheral neural entrapment neuropathies; brain and upper limb anatomy			
Day	# Hours	Topic	Faculty
1	1	PBL pre-session	PBL Team
	1.5	PBL Case: Caught in the Sand	PBL Team
	2	Internal Anatomy of Hemispheres	Baker
2	2	Entrapment Neuropathies, Root Lesions, Low Back Pain Syndrome, Cervical Pain Assessment	Haider
	1	Forearm: Lecture	Colgan
	3	Forearm: Lab	Colgan
3	2	Brain and Brain Stem Anatomy and Overview	Baker
	3.5	Doctoring: Substance Abuse	Jafri and Staff
4		Preceptor Visit Opportunity	
	1	Wrist and Hand: Lecture	Colgan
	3	Wrist and Hand: Lab	Colgan / Baker
5	1.5	PBL Wrap-up	PBL Team
	1	Thinking Beyond the Case: Differential Diagnosis of Peripheral Neural Entrapment	Rai

Week 4			
Spinal cord pathways and injuries; upper limb injuries and rehabilitation			
Day	# Hours	Topic	Faculty
1	1	Descending Motor Control Upper	D. Ethell
		Preceptor Visit Opportunity	
2	2	Somatosensory Pathways	I. Ethell
	1	Gluteal Region and Posterior Thigh: Lecture	Colgan
	3	Gluteal Region and Posterior Thigh: Lab	Colgan / Baker
3	1	Imaging of the Upper Limb	TBA
	3	Upper Extremities	Van Holten and Staff
4		Preceptor Visit Opportunity	
	1	Anterior and Medial Thigh: Lecture	Colgan
	3	Anterior and Medial Thigh: Lab	Colgan / Baker
5	1.5	Point-Counter-Point Discussion	PBL Team
	2	Clinical Case: Spinal Cord Injury	Baker / Colgan / D. Ethell / I. Ethell

Week 5			
Lower limb anatomy and injuries, stress management and critical thinking			
Day	# Hours	Topic	Faculty
1	1	Neurogenetics 1	Straus
	2	Critical Thinking	Vadheim
		Preceptor Visit Opportunity	
		On-line Stress Questionaire	L. Hammond
2	1	Leg and Foot: Lecture	Colgan
	3	Leg and Foot: Lab	Colgan
3	1	Cognitive Development	L. Hammond
	1	Imaging of the Lower Limb	TBA
	3	Doctoring: Domestic Violence	Jafri and Staff
4	1	Stress Management: Review Stress Test	L. Hammond
		Results	
	3	Doctoring	Sallis and Staff
5		No Class - Preparation for Final Exam	

Week 6			
Integrated Examination Period			
Day	# Hours	Topic	Faculty
1	2	Didactic Exam	Block Faculty
2	3	Anatomy Lecture and Lab Exam	Colgan / Baker
3	3	Lower Extremities	Van Holten and Staff

Block 5 - Clinical Neurosciences I

Course Description:

- Covers the structures and functions of the central nervous system including the visual and auditory systems. Gross anatomy lectures and laboratories focus on the head and neck. Students are also introduced to the neurochemical basis of psychiatric disorders and psychiatry as well as neurogenetics.

Course Objectives:

- Learn the cellular and gross anatomy of the brain and spinal cord.
- Understand how neurological signs result from lesions in specific areas of the brain and spinal cord.
- Understand what is tested and discovered by a basic neurological exam.
- Develop basic diagnostic skills for disorders of the central nervous system (i.e. Introductory neurology), and understand what further tests can be used to assist in a differential diagnosis, such as MRI, CT, PET, electrophysiology and behavioral tests.
- Understand the gross anatomy of the head and neck, including the skull, muscles, peripheral and cranial nerves, integument, larynx, and pharynx.
- Understand the anatomy and physiology of the visual and auditory systems.

Course Organization:

- Students will have a maximum of 10 hours of didactic lecture instruction each week.
- Students will participate in one or two laboratory exercises each week which illustrate key principles provided in classroom lectures.
- Groups of 6 - 8 students will meet each week for Problem-Based Learning with a faculty or clinician facilitator; this group will remain together throughout the block.
- A different group of 6 - 8 students will meet every other week for Doctoring sessions with a physician facilitator and psychologist/social worker as a tutor, this group will remain together throughout the block.
- Every other week, students will participate in clinical skills training experiences in small groups with clinicians and standardized patients.
- Once each month, each student will meet with his/her preceptor and shadow this physician in his/her medical office, clinic or on hospital rounds.
- Students will complete on-line assessments each week.
- Students will take a comprehensive final exam at the end of the block, an anatomy lecture and lab exam, as well as be evaluated for clinical skills competency.

Week 1			
Skull, Cranial Nerves and Brainstem			
Day	# Hours	Topic	Faculty
1	0.5	PBL: pre-session	PBL Team
	1.5	PBL Case: Brain in the Balance	D.Ethell / Baker / TBA
	2	The Skull: Lab	Colgan / Baker
2	1	Cranial Nerve Overview	Baker
	1	Superficial Face: Lecture	Colgan
	3	Superficial Face: Lab	Colgan / Baker
3	1	Brainstem 1 - Medulla	D.Ethell
	1	Brainstem 2 - Pons	Colgan
	3	Doctoring 1: Headache, Stress Management	Jafri and Staff
4	1	Brainstem 3 - Midbrain	I.Ethell
	1	Deep Face: Lecture	Colgan
	3	Deep Face: Lab	Colgan / Baker
5	1.5	PBL Wrap-up	PBL Team
	1	Thinking Beyond the Case/Differential	Rai
	1.5	Neurogenetics 2	Straus

Week 2			
Coordination of Movement and Balance			
Day	# Hours	Topic	Faculty
1	0.5	PBL: pre-session	PBL Team
	1.5	PBL: The Dawdler	D.Ethell / Baker / TBA
	1	The Cerebellum	Colgan
2	1	Basal Ganglia	D.Ethell
	1	Cerebral Circulation: Lecture	Baker
	2	Cerebral Circulation: Lab	Baker
3	1	Vestibular	D.Ethell
	1	Eye Movements	Colgan
	3	Clinical Skills: Neuro	VanHolten and Staff
4	1	Anatomy of Cranial Vault: Lecture	Baker
	3	Anatomy of Cranial Vault: Lab	Colgan / Baker
5	1.5	PBL Wrap-up	D.Ethell / Baker / TBA
	1	Thinking Beyond the Case/Differential	Rai
	3	Clinical Cases: Brainstem	D.Ethell / Baker I.Ethell / Colgan

Week 3			
Limbic System and Memory			
Day	# Hours	Topic	Faculty
1	0.5	PBL pre-session	PBL Team
	1.5	PBL: The Name's the Same	D.Ethell / Baker / TBA
	1	Hypothalamus	D.Ethell
2	1	CNS Synapses	I.Ethell
	1	Anterior Triangle of the Neck: Lecture	Colgan
	3	Anterior Triangle of the Neck: Lab	Colgan / Baker
3	1.5	Neurogenetics 3: Alzheimer's Disease, Parkinson's Disease, ALS, Behavior Disorders Deafness, Blindness	Straus
	1	Neurodegenerative Dementing Diseases	D.Ethell
	3	Clinical Skills: Ophthamology	VanHolten and Staff
4	1	Limbic System	D.Ethell
	1	Thalamus	I.Ethell
	3	Neuroradiology Images: Lab	Obenaus
5	1.5	PBL Wrap-up	D.Ethell / Baker / TBA
	1	Thinking Beyond the Case/Differential	Rai

Week 4			
Cerebral Cortex and Introduction to Psychiatry Nasal and Oral Cavities			
Day	# Hours	Topic	Faculty
1	0.5	PBL pre-session	PBL Team
	1.5	PBL: Memory Lane	I.Ethell / Baker / TBA
	1.5	Cortex	I.Ethell
	1.5	Neurochemical Basis of Psychiatric Disorders	Johnson
2	2	Introduction to Psychiatry	Summerour
	1	Nasal and Oral Cavities: Lecture	Colgan
	3	Nasal and Oral Cavities: Lab	Colgan / Baker
3	1	Temporal Lobe	D.Ethell
	1	Hippocampus-Synaptic Plasticity	I.Ethell
	3	Clinical Skills: ENT	VanHolten and Staff
4	2	Introduction to Psychiatric Exam	Summerour
	2	Orbit: Lab	Colgan / Baker
5	1.5	PBL Wrap-up	I.Ethell / Baker / TBA
	1	Thinking Beyond the Case/Differential	Rai
	1	Embryology of the Head and Neck	Colgan

Week 5			
Visual System and Hearing / Pharynx and Larynx			
Day	# Hours	Topic	Faculty
1	1	The Eye	Colgan
	1	The Retina	I.Ethell
	1	The Pharynx and Larynx: Lecture	Colgan
	3	The Pharynx and Larynx: Lab	Colgan / Baker
2	1	Visual Pathways	I.Ethell
	2	Visual Disorders	Miller
	3	Clinical Skills Review	VanHolten and Staff
3	1	Outer and Middle Ear	Colgan
	1	Auditory System	D.Ethell
	2	Clinical Cases: Cortex	Baker / Colgan
			D.Ethell / I.Ethell
4	2	Hearing Disorders: Lecture	Milner
	3	Hearing Testing: Lab	Milner

Week 6			
Integrated Examination Period			
Day	# Hours	Topic	Faculty
1	3	Final Exam	
2	2	Anatomy Lecture and Lab Exam	
3	3	Final Exam: Doctoring and IPE	

Block 6 - Infectious Diseases

Course Description:

- Covers the pathophysiology, pharmacology, physical diagnosis and treatment of bacterial, viral, fungal and parasite-mediated infectious diseases; host defense and immunity; immune system disorders; topics in clinical hematology and oncology; and epidemiology and clinical reasoning skills.

Course Objectives:

- Understand the fundamental microbiology of the major bacterial, viral, fungal and parasitic pathogens of humans.
- Understand the mechanisms of pathogenesis of these microbial agents, the infectious diseases they cause, and their clinical diagnosis.
- Learn the basic laboratory methods used in identifying the major microbial human pathogens.
- Understand the basic pharmacology of the major antimicrobial agents and their spectrum of action.
- Understand the roles of the immune system in both protection from disease and in hypersensitive and autoimmune reactions.
- Gain a greater understanding of major epidemiologic principles and strengthen clinical reasoning skills.
- Understand the basic pathophysiology of the major leukemias and lymphomas.
- Understand the mechanisms of hematopoeisis and hemostasis, and the genetics of hemoglobinopathies.
- Understand the major white blood cell disorders and the approach to patients with hematologic abnormalities.

Course Organization:

- Students will have a maximum of 10 hours of didactic lecture instruction each week.
- Students will participate in one or two laboratory exercises each week which illustrate key principles provided in classroom lectures.
- Groups of 6 - 8 students will meet each week for Problem-Based Learning with a faculty or clinician facilitator; this group will remain together throughout the block.
- A different group of 6 - 8 students will meet every other week for Doctoring sessions with a physician facilitator and psychologist/social worker as a tutor, this group will remain together throughout the block.
- Every other week, students will participate in clinical skills training experiences in small groups with clinicians and standardized patients.
- Once each month, each student will meet with his/her preceptor and shadow this physician in his/her medical office, clinic or on hospital rounds.
- Students will complete on-line assessments each week.
- Students will take a comprehensive final exam at the end of the block, as well as be evaluated for clinical skills competency.

Week 1			
Viral Causes of Infectious Disease			
Day	# Hours	Topic	Faculty
1	1.75	Orientation to Year 2 and Block 6	Chair/Thread Coordinators
	1	Viral Classification, Structure, Replication and Pathogenesis	Schiller
	1	Herpesviruses: HSV-1, HSV-2, VZV, EBV	Schiller
	0.5	PBL pre-session	Bricker / Shankel / Harris
	2	PBL: "Just His Luck"	Bricker / Shankel / Harris
2	1	CMV, HSV-6, HSV-7, HSV-8; Adenoviruses, Papillomaviruses	Schiller
	1	Polyomaviruses, Poxviruses, Parvoviruses	Schiller
	3	Clinical Skills: H & P Review and Vital Signs	Van Holten and IPE Team Standardized pts
3	1	Picornaviruses, Coronaviruses, Noraviruses	Schiller
	1	Paramyxoviruses and Orthomyxoviruses	Schiller
	2	Virology Lab Methods	Schiller
4	1	Rhabdoviruses, Filoviruses, Bornaviruses, Reoviruses	Schiller
	1	Togaviruses, Flaviviruses, Bunyaviridae, Arenaviridae	Schiller
	2	PBL: "Just His Luck"	Bricker / Shankel / Harris

Week 2			
Viral and Bacterial Causes of Infectious Disease			
Day	# Hours	Topic	Faculty
1	1	Overview of Antiviral Therapy	Byus
	1	Hepatitis Viruses	Schiller
	0.5	PBL pre-session	Shankel / Bricker / Marcinko
	2	PBL: "When It Rains It Pours"	Shankel / Bricker / Marcinko
2	1	Retroviruses	Schiller
	1	Bacterial Structure & Function and Genetics	Schiller
	2	Bacteriology Lab Methods	Schiller
3	1	Host-Bacteria Interactions	Schiller
	1	Overview of Antibacterial Agents	Schiller
		Preceptor Visit Opportunity	
4	1	Staphylococci	Schiller
	1	Streptococci and Enterococci	Schiller
	1	Faculty Development: Unit II Classroom	Hunt and Doctoring Group
	3	Doctoring II	MD + Psychologist for each group of 8 students
5	1	Klebsiella, Haemophilus, Legionella	Schiller
	1	Mycoplasma, Corynebacteria, Bordetella	Schiller
	2	PBL: "When It Rains It Pours"	Shankel / Bricker / Marcinko

Week 3			
Bacterial Causes of Infectious Disease			
Day	# Hours	Topic	Faculty
1	1	Host Defenses vs. Microbial Challenges	Carson
	1	Mycobacteria	Schiller
	0.5	PBL pre-session	Shankel / Bricker / Harris
	2	PBL: "Another Day in the Clinic"	Shankel / Bricker / Harris
2	1	Nocardia, Actinomyces, Pseudomonas and Enterobacteriaceae	Schiller
	1	Intestinal Pathogenic Bacteria - part 1	Schiller
	3	Infectious Disease Cases - Small Groups	Schiller
3	1	Intestinal Pathogenic Bacteria - part 2	Schiller
	1	Non-sporeforming Anaerobes; Bacillus, Clostridia	Schiller
	3	Clinical Skills: Cardiac	Van Holten and IPE Team
4	1	Clostridia (continued), Treponema	Schiller
	1	Neisseria and Listeria	Schiller
	2	PBL: "Another Day in the Clinic"	Shankel / Bricker / Harris
5	2	Antibacterial Therapy	Byus
		Preceptor Visit Opportunity #2	

Week 4			
Role of Bacteria, Fungi and Helminths in Infectious Diseases			
Day	# Hours	Topic	Faculty
1	1	Calymmatobacteria, Chlamydia	Schiller
	1	Zoonotic bacteria	Schiller
	0.5	PBL pre-session	Shankel / Bricker / Marcinko
	2	PBL: "More Urgent Care"	Shankel / Bricker / Marcinko
2	1	Borrelia, Rickettsia	Schiller
	1.5	Helminths - part 1	Platzer
3	1.5	Medical Mycology - part 1	Schiller
	0.5	Antifungal Therapy	Byus
	3	Clinical Skills: Respiratory Exam	Van Holten and IPE Team
4	1	Medical Mycology - part 2	Schiller
	1.5	Helminths - part 2	Platzer
	1	Faculty Development: Unit II Classroom	Hunt and Doctoring Team
	3	Doctoring: Asthma	MD + Psychologist
5	2	PBL: "More Urgent Care"	Shankel / Bricker / Marcinko
	3	Clinical Microbiology/Pathology Laboratory	Atkinson

Week 5			
Toxicology, Hematology and Infectious Disease			
Day	# Hours	Topic	Faculty
1	2	Toxicology	Byus
	0.5	PBL pre-session	Shankel / Bricker / Harris
	2	PBL: "Dysuria, Two Very Different Causes"	Shankel / Bricker / Harris
2	2	Introduction to hematopoiesis; iron turnover and deficiences; B12 and folate metabolism, hemolytic anemia	Ibrahim
		Preceptor Visit Opportunity #3	
3	1	Infections in the Compromised Host	Larson
	1	Nosocomial Infections	Larson
	3	Clinical Skills: HEENT	Van Holten and IPE Team
4	2	Parasitology - Amebae and Flagellates	Schiller
	1	Faculty Development; Unit II Classroom	Hunt and Doctoring Group
	3	Doctoring II: Translator	MD + Pscyhologist
5	2	Parasitology - Ciliates, Babesia, Coccidian Protozoa, Malaria	Schiller
	0.5	PBL pre-session	Shankel / Bricker / Harris
	2	PBL: "Dysuria, Two Very Different Causes"	Shankel / Bricker / Harris

Week 6			
Hematology and Oncology			
Day	# Hours	Topic	Faculty
1	2	Introduction to WBC Disorders	Howard
		Genetics of Hemoglobinopathies	
	0.5	PBL pre-session	Bricker / Shankel / Marcinko
	2	PBL: "Emergency Room Bleeding"	Bricker / Shankel / Marcinko
2	3	HIV & Sexually Transmitted Diseases	Larson
	3	Blood Banking Lecture and Laboratory	Atkinson
3	2	Hemostasis & Thrombosis; Lymphoma	Howard
	3	Clinical Skills: Abdomen	Van Holten and IPE Team
4	2	Leukemia, lymph node disease, and plasma cell dyscrasias	Howard
	2	PBL: "Emergency Room Bleeding"	Bricker / Shankel / Marcinko
5	1.25	Pharmacokinetics and dosing of agents	Byus
		Preceptor Visit Opportunity #4	

Week 7			
Epidemiology / Clinical Reasoning and Hemoglobinopathies			
Day	# Hours	Topic	Faculty
1	1	Epi/CR 1	Vadheim
	1	Epi/CR 2	Vadheim
	0.5	PBL: pre session	Shankel / Bricker / Harris
	2	PBL: "Weak and Tired"	Shankel / Bricker / Harris
2		Preceptor Visit Opportunity #5	
	3	Heme Microscopy Path Laboratory	Atkinson
3	1	Epi/CR 3	Vadheim
	1	Epi/CR 4	Vadheim
	2	Epi/CR Lab Session	Vadheim
4	2	Anti-neoplastic Drugs	Byus
	1	Faculty Development; Unit II Classroom	Hunt and Doctoring Team
	3	Doctoring II: Twinkie	MD + Psychologist
5	1.5	Newborn screening for the hemoglobinopathies and other disorders	Bartley
	1.5	Review of cytogenetics and cytogenetic abnormalities in hematologic malignancies	Huang
	2	PBL: "Weak and Tired"	Bricker / Shankel / Harris

Week 8			
Infectious Disease, the Immune Response, and Epidemiology / Clinical Reasoning			
Day	# Hours	Topic	Faculty
1	1	Hypersensitivity and Autoimmunity	Carson
	2	Microbiology Review Session	Schiller
2	1	Immune responses gone awry: mechanisms and consequences	Carson
	1	Immune responses gone awry: clinical syndromes	Carson
	3	Infectious Disease Cases - Small Groups	Schiller
3	1	Fever, Sepsis	Cone
	1	TB and pneumonia	Cone
	1	Endocarditis	Cone
	3	Clinical Skills: Review Session	Van Holten and IPE Team
4	3	Doctoring II: Twinkie part 2	MD + Psychologist for each group of 8 students
5	1	Epi/CR 5	Vadheim
	1	Epi/CR 6	Vadheim
		Preceptor Visit Opportunity #6	

Week 9			
Integrated Examination Period			
Day	# Hours	Topic	Faculty
1	3	Comprehensive Final Exam	
2	3	Clinical Skills Exam	

Block 7 - Gastrointestinal, Endocrine & Reproductive Health II

Course Description:

- Advanced clinical perspective of anatomy, biochemistry, pathophysiology, physical diagnosis and imaging associated with endocrinology, reproductive health and disease, GI diseases, gender-specific diseases, skin manifestations of systemic disease, common infectious diseases and therapeutics, common cancers, prevention, and nutrition.

Course Objectives:

- Focus on the pathophysiology, pathology and presentation of major diseases of the gastrointestinal, endocrine and reproductive systems.
- Focus on the cutaneous manifestations of disease, as well as primary skin diseases.
- Understand how to prevent, diagnose and manage the more common diseases of these organs, including epidemiology, laboratory tests, applicable imaging, drug pharmacology, etc.
- Use patient-based clinical scenarios as problem-based learning tools to solidify the didactic presentations, increase competence in information acquisition, and solidify lifelong learning habits.
- Practice and increase competence in patient examination and patient-doctor interactions.

Course Organization:

- Students will have a maximum of 10 hours of didactic lecture instruction each week.
- Students will participate in one or two laboratory exercises each week which illustrate key principles provided in classroom lectures.
- Groups of 6 - 8 students will meet each week for Problem-Based Learning with a faculty or clinician facilitator; this group will remain together throughout the block.
- A different group of 6 - 8 students will meet every other week for Doctoring sessions with a physician facilitator and psychologist/social worker as a tutor, this group will remain together throughout the block.
- Every other week, students will participate in clinical skills training experiences in small groups with clinicians and standardized patients.
- Once each month, each student will meet with his/her preceptor and shadow this physician in his/her medical office, clinic or on hospital rounds.
- Students will complete on-line assessments each week.
- Students will take a comprehensive final exam at the end of the block, as well as be evaluated for clinical skills competency.

Week 1			
Intestinal Inflammation			
Day	# Hours	Topic	Faculty
1	1	Introduction to mucosal immunity and immune related GI disease	Lo
	1	Pathophysiology of Intestinal Disease	Mishra
	1	Inflammatory bowel disease	Mishra
	0.5	PBL: pre session	Bricker / Shankel / Harris
	2	PBL: A Young Woman's Abdominal Woes	Bricker / Shankel / Harris
2	1	GI Pharmacology	Byus
	1	Irritable bowel	Mishra
	1	Pathophysiology of Celiac Disease and Malabsorption	Mishra
	3	Gastrointestinal bleeding	Thiruvengadam
3	1	Helicobacter pylori differential diagnosis	Gabriel
	1	Acid Reflux and its consequences	Gabriel
	3	IPE: Review tapes from Block 6 Final	VanHolten and IPE Staff
4	2	PBL: A Young Woman's Abdominal Woes	Bricker / Shankel / Harris

Week 2			
Dermatology / GI			
Day	# Hours	Topic	Faculty
1	2	Dermatology: Introduction and Bullous disease; Dermatological manifestation of systemic disease	Eremia
	0.5	PBL: pre session	Shankel / Bricker / Marcinko
	2	PBL: A Rash to Hash Out	Shankel / Bricker / Marcinko
2	1	Pediatric dermatology	Bhupathy
	1	Hair and Nails	Bhupathy
	1	Psoriasis	Bhupathy
	3	Dermatology lab	Atkinson
3	1	Melanoma and other pigmented lesions	Bhupathy
	1	Actinic Keratoses	Bhupathy
	1	Top 20 common dermatological conditions	Bhupathy
	3	Doctoring: Pancreatic Cancer	Hunt and Doctoring Team
4	2	Dysphagia (including Esophageal cancer)	Thiruvengadam
	1	Gastric Cancer	Thiruvengadam
	2	PBL: A Rash to Hash Out	Shankel / Bricker / Marcinko
5		Preceptor Visit Opportunity	

Week 3			
GI Cancer			
Day	# Hours	Topic	Faculty
1	3	GI and Hepatobiliary Imaging	Thiruvengadam
2	3	Colon Cancer	Thiruvengadam
	3	GI Path lab/GI clinical vignettes	Atkinson

Week 4			
Hepatology			
Day	# Hours	Topic	Faculty
1	0.5	PBL: pre session	Shankel / Bricker / Harris
	1	PBL: Judy Returns from Holiday	Shankel / Bricker / Harris
2	1	Review of Anatomy and histology of the liver	Huang
		Clinical approach to liver disease	
	1	Jaundice and Cholestasis	Huang
		Pathophysiology of hepatitis and cholestasis	
	3	Liver pathology / liver vignettes	Atkinson
3		Suggested Preceptor Visit	
	3	Real patient history and physical	VanHolten and IPE Staff
4	1	Chronic hepatitis and Cirrhosis	Gabriel
		Acute Hepatitis and Fulminant Liver Failure	
	1	Metabolic liver disease	Gabriel
	3	Pancreatic Disease	Thiruvengadam
5	2	PBL: Judy Returns from Holiday	Shankel / Bricker / Harris

Week 5			
Disorders of Metabolic Regulation/GI Endocrine			
Day	# Hours	Topic	Faculty
1	1	Intro to nutrition	T.Shankel
	1	Physiologic basis for diets and dietary supplements	T.Shankel
	0.5	PBL: pre session	S.Shankel/Bricker/Marcinko
	2	PBL: The changing face of Adam Smith	S.Shankel/Bricker/Marcinko
2	1	Pharmacology of appetite control	Stanley
	1	Obesity: Epidemiology and complications	Valdheim
		Suggested Preceptor Visit	
3	1	Clinical Skills: Review write ups	VanHolten and IPE Staff
	1	Review of Diabetes mellitus pathophysiology	Firek
	1	Diabètes complications	Firek
4	1	Pharmacology of Diabetes Treatments	Shyy
	1	Pathophysiology of hepatitis and cholestasis	Huang
	1	Clinical spectrum of fatty liver disorders	Huang
	3	Doctoring: Obesity	Hunt and Doctoring Staff
5	1	Neuroendocrine tumors of the GI tract	Firek
	2	PBL: The changing face of Adam Smith	S.Shankel/Bricker/Marcinko

Week 6			
General Endocrinology			
Day	# Hours	Topic	Faculty
1	0.5	PBL: pre session	Bricker / Shankel / Harris
	2	PBL: The Anxious Mother	Bricker / Shankel / Harris
2	1	Disorders of the anterior pituitary	Firek
	1	Disorders of the posterior pituitary	Firek
	3	Endocrine Pathology, Imaging and Lab Skills	Atkinson
3	1	Thyroid disorders 1	Firek
	1	Thyroid disorders 2	Firek
	3	Clinical Skills: Ophthalmology	Van Holten and IPE Staff
4	1	Parathyroid disorders and vitamin D	Firek
	1	Osteoporosis and metabolic bone disease	Firek
	2	Critical thinking skills lab	Vadheim
5	1	Pharmacology of Glucocorticoids	Shyy
	1	Detection of Athletic Performance Enhancers	Shyy
	2	PBL: The Anxious Mother	Bricker / Shankel / Harris

Week 7			
Men's Health			
Day	# Hours	Topic	Faculty
1	1.5	PBL: "The Lost Libido"	Shankel / Bricker / Marcinko
	1	Pathophysiology of the Prostate (BPH and Cancer)	Torrey
	1	Clinical approaches to Prostate Disease (BPH-Cancer)	Torrey
	2.5	Male reproductive Pathology	Atkinson
2	1	Testicular and scrotal diseases (Malignant to benign)	Torrey
	1	Screening for diseases in men	Torrey
	3	Male Gonadal evaluation, Treatment of Hypogonadism and Erectile Dysfunction	Torrey
3	1	Use and abuse of Anabolic Steroids	Byus
	1	Disorders of Male Fertility	Torrey
	3	Doctoring: Men’s Health	Hunt and Doctoring Staff
4	1	Adrenal pathophysiology 1	Chandiok
	1	Adrenal pathophysiology 2	Chandiok
	2	PBL: "The Lost Libido"	Shankel / Bricker / Marcinko

Week 8			
Women's Health and Reproductive Medicine			
Day	# Hours	Topic	Faculty
1	0.5	PBL: pre session	Shankel / Bricker / Harris
	1.5	PBL: "Why Can't I Get Pregnant?"	Shankel / Bricker / Harris
2	3	Maternal physiological Adaptations to Pregnancy, Menopause and its sequelae	Sinkhorn
	1.5	Evaluation and Treatment of Female Infertility	Sinkhorn
3	3	Clinical Skills: Breast and Pelvic	Van Holten and IPE Staff
4	4	Amenorrhea, Pre-eclampsia and hypertensive disorders of pregnancy, Polycystic Ovary Syndrome, Oligomenorrhea; Pelvic pain and Endometriosis	Marcus
5	2	PBL: "Why Can't I Get Pregnant?"	Shankel / Bricker / Harris

Week 9			
Gynecological Malignancies			
Day	# Hours	Topic	Faculty
1	1	Pathology of the uterus	Sinkhorn
	1	Benign and Malignant Breast Disease	Sinkhorn
2	1	Cervical Cancer	Marcus
	1	Uterine Cancer	Marcus
	2	Gynecological Pathology	Atkinson
3	1	Maternal serum screening	Lee
	1	Prenatal diagnosis	Brar
	2	Malignant tumors of the ovaries	Sinkhorn
4	1	Screening for reproductive cancer in women	Sinkhorn
	1	Genetics of reproductive malignancy	Bartley
	3	Doctoring: Women's Health Screening Visit	Hunt and Doctoring Staff
5	2	Overview of gynecology – review	Sinkhorn
	2	Overview of gynecology cont / student questions	Sinkhorn

Week 10			
Integrated Examination Period			
Day	# Hours	Topic	Faculty
1	3	Comprehensive Final Exam	
2	3	Clinical Skills Exam	

Block 8 - Clinical Neurosciences II

Course Description:

- Covers advanced clinical perspective of neurology, neuropathology, psychiatry, and neuropharmacology that is coordinated with physical and psychological clinical skills development.

Course Objectives:

- Understand the pathophysiology, pathology, clinical features, diagnostic tools and treatment options for various neurological disorders including: stroke, Parkinson's disease and other movement disorders, multiple sclerosis and other myelopathies, headaches, seizures and syncope, coma and other disorders of consciousness, language disorders, aphasias, disorders involving the corticospinal tracts, sleep disorders including obstructive sleep apnea syndrome, narcolepsy as well as disorders of hypersomnolence, disorders of circadian rhythms, insomnias and parasomnias.
- Understand the polysomnography as the mainstay of diagnostic options for sleep disorders.
- Understand the utility and limitations of the EEG as a diagnostic tool.
- Understand the principles of developmental neuropathology (early childhood, middle childhood, and adolescence).
- Know the prototypic drugs used in the treatment of neurological and psychiatric disorders. For each prototype drug, the student is expected to learn the following: primary pharmacologic actions, targets, mechanism of action at the biochemical level, pharmacokinetics of the drug in the body, common adverse effects, life-threatening and toxic effects, major drug and disease interactions, general clinical indications and/or applications for use of the drug.
- Understand the primary pharmacologic actions, targets, and mechanism of action at the biochemical level of drugs of abuse. Additionally, the student should know the acute and chronic effects of these agents and the clinical presentation in overdose.
- Understand the neurochemical basis, clinical features, diagnostic tools, and treatment options for various psychiatric disorders including: mood disorders, anxiety, substance abuse, personality disorders, schizophrenia, somatotization, eating disorders, gender identity disorders, and sexual disorders (along with normal sexuality).
- Understand the principles of geriatric psychiatry.
- Understand how to deal with death and dying.
- Understand the link between chronic illness and depression as well as anxiety.
- Understand the medical, psychological, and legal issues associated with pain management.
- Understand the basic principles of psychotherapies.

Course Organization:

- Students will have a maximum of 10 hours of didactic lecture instruction each week.
- Students will participate in one or two laboratory exercises each week which illustrate key principles provided in classroom lectures.
- Groups of 6 - 8 students will meet each week for Problem-Based Learning with a faculty or clinician facilitator; this group will remain together throughout the block.
- A different group of 6 - 8 students will meet every other week for Doctoring sessions with a physician facilitator and psychologist/social worker as a tutor, this group will remain together throughout the block.
- Every other week, students will participate in clinical skills training experiences in small groups with clinicians and standardized patients.
- Once each month, each student will meet with his/her preceptor and shadow this physician in his/her medical office, clinic or on hospital rounds.
- Students will complete on-line assessments each week.
- Students will take a comprehensive final exam at the end of the block, as well as be evaluated for clinical skills competency.

Week 1			
Fear and Anxiety / Mood Disorders / Headaches			
Day	# Hours	Topic	Faculty
1	1	PBL pre-session	PBL Team
	1.5	PBL: Losing Control	PBL Team
	1.5	Antidepressants and Mood Stabilizers	Johnson
	2	Mood Disorders 1	Villarosa
2	1.5	Sedative-Hypnotics / Anxiolytic Drugs	Johnson
	2	Mood Disorders 2	Villarosa
3	2	Anxiety Disorders 1	Silver
	3.5	Doctoring / IPE	Clinical Skills Staff
4	2	Anxiety Disorders 2	Summerour
	1	Autonomic Pharmacology Review	Johnson
5	1.5	PBL: Small Group Discussion of Weekly Clinical Case	PBL Team
	1	Clinical Reasoning: Thinking Beyond the Case	Summerour
	1	Other Causes of Headache	Rai
	3	Doctoring: Taking a History of Headaches (A Neurology Perspective)	Rai

Week 2			
Substance Abuse / Seizures / Dymelinating Disease			
Day	# Hours	Topic	Faculty
1	1.5	ONLINE PBL Case: Mrs. White's Troubles	PBL Team
2	2	Alcohol 1 / Substance Abuse	Carter
	1.5	Drugs of Abuse 1 - EtOH/MeOH	Johnson
	1	Seizures, Epilepsy and Syncope	Rai
3	1	Neuropathology and Neurodiagnosis	Atkinson
	1	Pathology of Dymelinating Disease	Atkinson
	3.5	Doctoring: IPE	Doctoring Staff
4	2	Alcohol 2 / Substance Abuse	Carter
	1	Normal Human Sexuality and Sexual Disorders	Summerour
	2	EEG Lecture / Lab	Rai
5	1.5	PBL Wrap-up	PBL Team
	1	Clinical Reasoning: Thinking Beyond the Case	Summerour
	1	Myelopathies and Multiple Sclerosis	Rai
	1.5	Drugs of Abuse 2 - Stimulants	Johnson
		(cocaine, nicotine, etc.); Hallucinogens	

Week 3			
Movement Disorders / Trauma / Learning			
Day	# Hours	Topic	Faculty
1	1	PBL pre-session	PBL Team
	1.5	PBL Case: Joey - I Want To Be A Good Boy	PBL Team
	1	Neuropathology of Movement Disorders	Atkinson
	1	CNS Trauma	Atkinson
	2	Child and Adolescent Psychiatry	Brandon
2	1	Learning - How Do We Learn?	Hammond
	2	Parkinson's Disease and Other Movement Disorders	Rai
	1.5	Neuropharmacology of Movement Disorders	Johnson
3	1	Language and Aphasias	Rai
	1	Head Injury with Brain Stem Signs; Coma, etc.	Rai
	1	Craniocerebral Trauma	L.Dayes
	3	Doctoring: IPE	Doctoring / IPE Team
4	1	Learning Disorders	Shu
	1	Developmental Pathology in Early Childhood	Shu
	1	Developmental Pathology in Middle Childhood and Adolescence	Shu
5	1.5	PBL Wrap-up	PBL Team
	1	Clinical Reasoning: Thinking Beyond the Case	TBA
	3	Dx Headache	Johnson

Week 4			
Seizures / Stroke			
Day	# Hours	Topic	Faculty
1	1	PBL pre-session	PBL Team
	1.5	PBL Case: Weakness for Brie	PBL Team
	2	Psychotherapies	Stoessel
2	1	Pathology of Cerebrovascular Disease and Stroke	Atkinson
	2	Personality Disorders	Brandon
3	2	EEG Lab	Rai
	3	Doctoring: IPE	IPE Team
4	1	CNS Tumors	Atkinson
	1	Seizures, Epilepsy and Syncope	Rai
	2	Geriatric Psychiatry	Silver
5	1.5	PBL Wrap-up	D.Ethell / Colgan / Clinician
	1	Clinical Reasoning: Thinking Beyond the Case	Rai
	1	Drug Interactions in the Geriatric Patient	Shankel
	2	Antiepileptic Pharmacology and Excitotoxicity	Johnson

Week 5			
Schizophrenia			
Day	# Hours	Topic	Faculty
1	1	PBL pre-session	PBL Team
	1.5	PBL Case: The Graduate Student	PBL Team
	2	Antipsychotic Drugs	Johnson
2	2	Schizophrenia	Summerour
	2	Somatization / Eating Disorders / Chronic Illness	Silver
3	2	Gender Identity Disorder / Dealing with Dying	Summerour
	3	Doctoring: IPE	Doctoring Staff
4	2	Pain Management / Panel Discussion	Rai / Summerour Johnson / Jiang / Brandon
	4	Sleep and Sleep Disorders / Sleep Lab	Rai
5	1.5	PBL Wrap-up	PBL Team
	1	Clinical Reasoning: Thinking Beyond the Case	Summerour

Week 6			
Integrated Examination Period			
Day	# Hours	Topic	Faculty
1		Didactic Exam	Johnson
2			
3		Doctoring: IPE Exam	Doctoring / IPE Team

Block 9 - Cardiovascular, Renal & Respiratory Medicine II

Course Description:

- Pathology and pathophysiology of these systems (continued), including hypertension, developmental disorders, therapeutics - pharmaceuticals and other treatments, clinical trials and epidemiology, common cancers, common infectious agents and therapeutics, and prevention.

Course Objectives:

- Understand the pathophysiology, pathology, and presentation of major diseases of the Cardiovascular, Renal and Respiratory systems.
- Understand how these organ systems interact in disease.
- Understand how to prevent, diagnose and manage major diseases of these organ systems by utilizing history and physical findings, radiological and nuclear medicine information, serum and urine laboratory tests, pulmonary function testing, electrocardiograms, echocardiograms, invasive hemodynamics, pharmacology, mechanical ventilation and other mechanical life support measures.
- Understand how to evaluate clinical trials and employ the best evidence-based practice wherever possible.
- Use electronic internet search tools and Personal Digital Assistants to assist in the diagnosis and management of major diseases and to understand their pathophysiology.
- Use Powerpoint to make effective presentations of important medical topics.

Course Organization:

- Students will have a maximum of 10 hours of didactic lecture instruction each week.
- Students will participate in one or two laboratory exercises each week which illustrate key principles provided in classroom lectures.
- Groups of 6 - 8 students will meet each week for Problem-Based Learning with a faculty or clinician facilitator; this group will remain together throughout the block.
- A different group of 6 - 8 students will meet every other week for Doctoring sessions with a physician facilitator and psychologist/social worker as a tutor, this group will remain together throughout the block.
- Every other week, students will participate in clinical skills training experiences in small groups with clinicians and standardized patients.
- Once each month, each student will meet with his/her preceptor and shadow this physician in his/her medical office, clinic or on hospital rounds.
- Students will complete on-line assessments each week.
- Students will take a comprehensive final exam at the end of the block, as well as be evaluated for clinical skills competency.

Week 1			
Fluid Balance and Glomerular Diseases			
Day	# Hours	Topic	Faculty
1	0.5	Course Introduction	S. Shankel / Loo
	2	PBL: "My eyelids are swollen"	Bricker / S. Shankel / Marcinko
2	1	Introduction to Nephrology	Bricker
	1	Diseases of Concentration, Dilution, and Volume Regulation	Bricker
	2	Lab Urinalysis / Blood Chems / GFR	S. Shankel / Bricker
3	1	Review of study design and quantitative methods covered in USMLE Step I	Valdheim
	1	Pharmacology of Diuretics	S. Shankel
	1	Renal Hemodynamics	S. Shankel
	3	Clinical Skills: Neuro Exam	Junkert
4	1	Glomerular Diseases of the Kidney Part I	S. Shankel
	1	Glomerular Diseases of the Kidney Part II	S. Shankel
	3	Doctoring: Polypharm Renal	Hunt
5	1	Case Presentation: Acute Kidney Disease	S. Shankel / Bricker
	2	PBL: "My eyelids are swollen"	Bricker / S. Shankel / Marcinko

Week 2			
Acute and Chronic Renal Failure / Acid-base Disturbances			
Day	# Hours	Topic	Faculty
1	1	Chronic Kidney Disease	Bricker
	2	PBL: Do I have to be on this Machine Forever?	Bricker / S. Shankel / Harris
	2	Lab: Renal Pathology	Atkinson
2	1	Interstitial Diseases of the Kidney and Obstructive Renal Diseases	Atkinson
	1	Chronic Kidney Disease - Treatment	S. Shankel
	1	Alkalosis	S. Shankel
3	1	Acidosis	Bricker
	1	Acute Kidney Disease & Hepatorenal	Bricker
	1	Diabetic Renal Disease	S. Shankel
	2	Case Discussion	S. Shankel / Bricker
4	2	PBL: Do I have to be on this Machine Forever?	Bricker / S. Shankel / Harris

Week 3			
Electrolyte Balance, Hypertension, and Ventricular Hypertrophy			
Day	# Hours	Topic	Faculty
1	1	Electrolytes III: Serum Calcium, Phosphorus, and Magnesium	S. Shankel
	2	PBL: Why do you Keep Switching my Medicines? Preceptor Visit Opportunity	Bricker / S. Shankel / Marcinko
2	1	Electrolytes I: Serum Sodium	S. Shankel
	2	Electrolytes II: Serum Potassium	Bricker
	2	Lab: Acid Base	S. Shankel / Bricker
3	1	Hypertension Epidemiology	S. Shankel
	1	Case Discussion: Hypertension	S. Shankel
	3	Clinical Skills: Male GU	Torrey
4	1	Ventricular Hypertrophy, Part I	Krishnan
	1	Ventricular Hypertrophy, Part II	Krishnan
	3	Doctoring: Cardiac Transplant I	Hunt
5	2	PBL: Why do you Keep Switching my Medicines?	Bricker / S. Shankel / Marcinko

Week 4			
Obstructive and Restrictive Lung Disease			
Day	# Hours	Topic	Faculty
1	1	Obstructive Lung Disease, Part I	Lineback
	1	Obstructive Lung Disease, Part II	Lineback
	1	Chronic Respiratory Failure	Lineback
	2	PBL: Doc, I Can't Breathe	Bricker / S. Shankel / Harris
2		Preceptor Visit Opportunity	
	2	Lab: Pulmonary Pathology	Atkinson
3	3	Pulmonary Disease Embolism, Hypertension, Deep Vein Thrombosis	Karody
	3	Clinical Skills: Musculoskeletal	Sallis
4		Preceptor Visit Opportunity	
	3	Doctoring: Cardiac Transplant, Part II	Hunt
5	1	Acute Respiratory Failure	Sheldon
	1	Parenchymal Restrictive Lung Disease, Part I and II	Sheldon
	1	Sleep Disorders / Case Studies	Sheldon
	2	PBL: Doc, I Can't Breathe	Bricker / S. Shankel / Harris

Week 5			
Genetic, Malignant and Environmental Lung Disease			
Day	# Hours	Topic	Faculty
1	1	Development and Pediatric Lung Diseases	Lineback
	1	Cystic Fibrosis	Lineback
	2	PBL: Doc, How Long Do I Have to Live?	Bricker / S. Shankel / Marcinko
		Preceptor Office Visit	
2		Preceptor Office Visit	
3	1	Occupational Lung Diseases	Sheldon
	1	Pleural Diseases	Sheldon
	3	Clinical Skills: Venipuncture	Ware
4	1	Pharmacology of the Renin-Angiotensin - Aldosterone System (RAAS)	Shyy
	1	Blood Gases	Lineback
	2	Doctoring: Asthma	Hunt
5	3	Lung Cancer and Pneumonia	Karody
	2	PBL: Doc, How Long Do I Have to Live?	Bricker / S. Shankel / Marcinko

Week 6			
Atherosclerotic and Arrhythmic Disorders of the Heart			
Day	# Hours	Topic	Faculty
1	1	Lipid Management	Firek
	2	PBL: Hi, Room 10, It's Me Again	Bricker / S. Shankel / Marcinko
	3	Workshop: Pre-op Evaluation	Loo
2	1	Atherosclerosis	Krishnan
	1	Acute Coronary Thrombosis	Krishnan
	1	Management of Actue Coronary Syndrome	Krishnan
	2	Lab: Cardiac Pathology	Atkinson
3	3	Clinical Skills: Dermatology Preceptor Office Visit	Eremia
4	3	Tachyarrhythmias: Pathogenesis	Krishnan
	1	Supraventricular Arrhythmias: Recognition and Treatment	Krishnan
	1	Ventricular Arrhythmias: Recognition and Management	Krishnan
	3	Doctoring: Case Presentations	Hunt
5	2	Bradyarrhythmias: Recognition and Management	Krishnan
	1	General Anesthesia Pharmacology Review	Shyy
	2	PBL: Hi, Room 10, It's Me Again	Bricker / S. Shankel / Marcinko

Week 7			
Congenital and Valvular Heart Disease and Heart Failure			
Day	# Hours	Topic	Faculty
1	2	PBL: Pump It Up	Bricker / S. Shankel / Harris
2	3	Arrhythmia Workshop	Krishnan
		Preceptor Office Visit	
3		Preceptor Office Visit	
4	1	Cardiogenic Shock	Krishnan
	1	Heart Failure	Krishnan
	1	Case Discussion	Krishnan
	2	PBL: Pump It Up	Bricker / S. Shankel / Harris

Week 8			
Interventional Therapy			
Day	# Hours	Topic	Faculty
1	1	Advanced Cardiac Life Support	Fargo
	2	PBL: Rescue 39 to Base - ETA - 5 min.	Bricker / S. Shankel / Harris
	1	Principles of Mechanical Artificial Ventilation	Sheldon
	1	Ethics: When to Pull the Plug	Sheldon
2	1	Pediatric Congenital Heart Disease	Krishnan
	1	Rheumatic Fever	Krishnan
	1	Mitral Valve Disease	Krishnan
		Preceptor Office Visit	
3	1	Transplantation	Walshstrom
	3	Clinical Skills: Practice OSCE	IPE Staff
4		Preceptor Visit Opportunity	
5	1	Aortic Valve Disease	Krishnan
	1	Endocarditis	Krishnan
	1	Peripheral and Aortic Vascular Disease	Krishnan
	2	PBL: Rescue 39 to Base - ETA - 5 min.	Bricker / S. Shankel / Harris

Week 9			
Rheumatological Disorders and Vasculitis			
Day	# Hours	Topic	Faculty
1	2	Rheumatology: Collagen Vascular Diseases	Gordon
2	2	Rheumatology: Systemic Vasculitis and Inflammatory Arthritis	Gordon
3	2	Rheumatology: Regional Musculoskeletal, Crystalin Arthropathies, and Metabolic Bone Disease	Gordon

Week 10			
Integrated Examination Period			
Day	# Hours	Topic	Faculty
1	3	Final Exam	
2	4	OSCE Final Exam	
3	8	OSCE Final Exam	

Block 10 - Integrative Assessment

Course Description:

- Students are provided USMLE Board review presentations on various subjects, complete the NBME Basic Science Comprehensive Exam, and must demonstrate mastery of their clinical skills by passing the OSCE.

Course Objectives:

- Be able to elicit a medical history of a specific problem, carry out a focused physical examination, construct a differential diagnosis, and counsel a patient on next steps in his or her care.
- Demonstrate skills for effective clinical reasoning, including appropriate use of a patient-centered approach to decision making.
- Apply your knowledge of basic science and pathophysiology concepts to board-type questions in preparation for taking USMLE Step 1.
- Develop an Individual Study Plan for preparation for USMLE Step 1.

Week 1			
Review / Practice USMLE Basic Science Exam Review Part I National Boards			
Day	# Hours	Topic	Faculty
1	4.5	NBME Basic Science Comprehensive Exam	Shankel
	2	Psychiatry Review - Optional	Summerour
2	2	Pharmacology Review - Optional	Byus / Johnson / Shyy
	2	Histopathology Review - Optional	Walker / Atkinson
3	2	Immunology Review - Optional	Carson
	2	Neuroscience Review - Optional	Baker / Colgan
			D.Ethell / I.Ethell
4	2	Anatomy Review - Optional	Colgan / Baker
	2	Biochemistry Review - Optional	Luben / Shyy
5	2	USMLE Test Results	UCLA: Doyle / Howard
	2	Pathology Review - Optional	Atkinson

THIRD YEAR CURRICULUM OVERVIEW: The main purpose of clinical clerkships is to move students toward a progressively higher level of responsibility for patient care, focusing on levels of professional work and competence.

The third year will be organized in the following manner: Students will take the Clinical Foundations Course during the first 2 weeks at the beginning of the 3rd year. Clinical Foundations (description follows in the next section) will be an intense clinical experience that will provide the students with the basic skills that they will need to participate in either the Medical Center-Based Clerkships or the Community-Based Clerkships.

After the Clinical Foundations Course, half the students will be assigned to Group A and half the students will be assigned to Group B. At the end of 26 weeks, the students assigned to the Medical Center-Based Clerkship will then rotate to the Community-Based Clerkship and vice-versa. The following lists the clerkships and the times students will be assigned to the clerkships:

<u>Group A: Medical Center-Based clinical clerkships: 26 weeks</u>

- 8 weeks – Medicine
- 4 weeks – Surgery
- 4 weeks – Pediatrics
- 4 weeks – Emergency Medicine
- 2 weeks – Neurology
- 4 weeks – Family Medicine

<u>Group B: Community-based Clerkships: 26 weeks</u>

- 2 weeks primary care – Internal Medicine or Family Medicine
    - Continuity (primary care)- 1 half day per week for 24 weeks
- 6 weeks – Obstetrics-Gynecology
- 4 weeks – Psychiatry
- 4 weeks – Surgery
- 4 weeks – Pediatrics including adolescent medicine
- 2 weeks selective: Radiology-imaging, Pathology, Dermatology, other
- 4 weeks – concentrated community service project

During the 3rd year students will rotate among clinical clerkships. For all of the clerkships there are themes related to the attitudes that the UCR School of Medicine faculty expects students to attain. The following are the attitudes that are expected to be developed in all students:

- Become an integral part and enthusiastic member of the medical team by participating in ward activities and by contributing to discussions related to patient care.
- Gain an understanding and appreciate the roles of various allied health care personnel contributions to patient care.

- Learn how to establish rapport with patients and allied health personnel.
- Begin to function as a physician by working cooperatively with patients and accepting increasing responsibility for their care.
- Begin to understand the humanistic side of medicine by treating and discussing patients in a concerned and compassionate manner.
- Learn how to involve the patient in the medical decision making process
- Begin furthering concepts around end of life care.
- Learn how to work with an underserved population.

The Medical Center-Based Clerkships will provide students with opportunities to be exposed to medical care that is provided either to inpatients or to patients that are seen by specialists, subspecialists or family practitioners in the hospital setting or clinic. Students will be assigned to one or more medical center sites for their medical center-based clinical clerkships.

The Community-Based Clerkships will provide students with opportunities to develop a panel of patients that they will follow over at least 26 weeks. When assigned to clerkships other than primary care, the student will return to their primary care practice 1 half day a week. The students will be in the role of a primary care provider for their patients, and any issues that arise for their patients will "trump" any other clerkship responsibilities and they will accompany their patients to appointments in specialty clinics and inpatient services. Additionally, the Community-Based Clerkships will give students an opportunity to have experiences in working in ambulatory settings, follow patients throughout their clinical experiences, and work within a team. Students will be assigned to one or more community sites for their community-based clinical clerkships. One half day per week the students will return to the UCR campus for longitudinal clerkships (identified below) and problem-based learning, case based discussions, lectures and clinical exercises.

For each of the clerkships, a clerkship director will be identified whose responsibilities include:

- Create a realistic set of clerkship objectives, skills, knowledge and attitudes that are tied to the Graduation competencies and directly link these objectives to clerkship activities and evaluation.
- Maintain orientation and common didactics across sites with the inclusion of imaging.
- Include students in activities related to patient safety, quality improvement (QI), chronic care initiatives, and the use of electronic patient records.
- Clearly define students' roles and responsibilities both to patients and to other members of the clinical team and hold them accountable.
- Require students to manage a significant number of new patients each week and extend their range of confidence with procedures
- Include direct observation or OSCEs in making final assessments

- Increase ambulatory experience with continuity in the same setting rather than variety of experiences across different clinics and sites.
- Support the students' connection with their patients.

During the third year, there will be longitudinal experiences. These courses are:

- Doctoring which will have a focus on systems (family, community, health care) and the opportunity for students to reflect on experiences from the clerkships;
- Advisor/Mentorship including the opportunity to combine clinical research with clinical care;
- Imaging which will include standard radiology and cross sectional imaging.

One-half day every other week the students will come together at the UC Riverside campus and participate in Doctoring, Advisor/Mentorship, or the Radiology/-Imaging clerkships. One-half day every other week the students will come together at the UC Riverside campus for case based learning, problem based learning, lectures and review of clinical involvement.

Students will be evaluated for each clerkship. There will also be required web based cases for each clerkship. Students will also keep a PDA log. All students will be required to enter patients that they are involved with on all rotations. The clerkship director will review the PDA log each week to assure that the student is getting the appropriate clinical experience for the clerkship and make adjustments when indicated.

At the end of the third year, students will have a final clinical skills assessment that will include specific clinical examinations, OSCEs and case based examinations.

LONGITUDINAL CLERKSHIPS:

The longitudinal clerkships include:

- Doctoring 3
- Radiology-Imaging
- Advisor/Mentorship Program

All three of these courses will be held throughout the third year. One-half day every other week will be set aside for these courses on a rotating basis. The following is a brief description of each of the longitudinal clerkships:

DOCTORING 3:

LEARNING OBJECTIVES FOR THE YEAR FOR DOCTORING 3

- Understand the social, economic, legal and ethical context of medical decision-making
- Become aware of the impact of personal bias and experience on medical decision-making.
- Develop skills in working in a team, including understanding role differentiation on a team
- Use the clerkship experiences to reflect on and thoughtfully make the transition from student to professional

How Doctoring 3 Differs from 1 and 2

- Active focus on teamwork
- Less interview practice
- Increased writing assignments
- Focused application and reflection on clerkship experience
- Formal assessments

Format: Doctoring 3 will be taught in small groups of 7 to 9 students with two tutors. One of the tutors will be a clinical physician, usually in primary care. The other will be a mental health professional, usually a psychiatrist, psychologist, or social worker.

Examples of how Doctoring 3 will work:

A. One of the Graduation competencies is PROFESSIONALISM, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population

- Professionalism is a focus of Doctoring 3.
- Requires self-awareness, and awareness of forces which affect our decisions and behavior.
- Demonstrate reliability, dependability, and integrity in interactions with colleagues and patients.
- Deal with professional mistakes openly and honestly in ways that promote patient trust and self-learning.

- Accurately assess one's personal strengths and limitations, relevant to one's practice of medicine and continued learning.
- Develop abilities to receive and provide constructive feedback as part of peer and self-assessment of professional behaviors.
- Understand appropriate coping mechanisms for dealing with stress, intellectual uncertainty, interpersonal conflict, and issues related to power.
- Use basic ethical concepts and approaches to identify and analyze the ethical dimensions of common situations in medical practice, health policy, and research.
- Understand the obligation to treat the individual patient, and discuss the conflicts between caring for a patient and caring for a population.
- Recognize an obligation to the health of society, locally, regionally, and nationally.
- Demonstrate the ability to provide leadership to groups of colleagues or patients.

As an example exercise, Doctoring students might take 5 minutes to write a paragraph on "What has been the biggest challenge to professionalism you have faced so far in medical school? "

B. Another graduation competency is SYSTEM-BASED PRACTICE, as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

Doctoring 3 students would:

- Discuss changing social, economic, and political factors that are affecting the patterns of health care delivery in the United States, and specifically in California.
- Know the structure and function of health care delivery and insurance systems currently used in the United States.
- Understand how payment systems for medical care affect decision making and care provision, and discuss strategies for delivering quality care in the face of reimbursement restrictions.
- Apply cost-effectiveness analysis to specific instances of diagnosis and treatment of disease and of health promotion.

Evaluations:
Tutors will complete formal narrative evaluations of the students twice each year. The mid-year evaluation is not sent to the Student Affairs Office (SAO), and is seen only by the student, tutors, and Course Director. This is for feedback only. The evaluation done at the end of the year will be submitted to the SAO and will be used in preparation of the Dean's letter for residency applications.

RADIOLOGY- IMAGING LONGITUDINAL CLERKSHIP

COURSE DESCRIPTION: Radiology will be a required longitudinal clerkship with case based and lecture teaching distributed throughout the third year. It will consist of an initial block during Clinical Foundations in which clinical principles of imaging are introduced followed by focused teaching sessions provided during the introductory sessions of the other core clerkships.

OBJECTIVES: The Radiology Clerkship will provide knowledge of basic radiographic anatomy and key imaging features of common diseases. Students will be expected to use the basic principles learned in the teaching sessions at each of the clerkship sites to which they are assigned.

GOALS: Student will:

- Develop basic skills in radiological diagnosis (how to read an x-ray).
- Be familiar with the scope of different imaging modalities and be aware of patients' experience in undergoing radiological procedures.
- Know the indications, contraindications, limitations and cost effectiveness of radiological examination.
- Know orderly imaging workup for common clinical disorders.
- Learn how to use the radiologist as a consultant.

KNOWLEDGE: Students will develop knowledge and information regarding the following imaging modalities:

- Computed radiography
  - cystography
  - chest radiography (CXR)
- Fluoroscopy
  - barium swallow/esophagram
  - barium enema
- Angiography
- Computed Tomography
  - conventional
  - spiral
  - electron beam
- Ultrasonography
- Magnetic Resonance Imaging
- Positron Emission Tomography (PET)
- Radionuclide Imaging
- Ultrasonography
- Radiation Safety
- Bone Densitometry

EVALUATION: There are five potential categories for evaluation. These include basic (radiographic) anatomy; Imaging modality, conventional radiography, CT, MRI, US, etc.; Diagnosis; Imaging work-up or management; and Radiation oncology. Faculty will decide on the methods to be used.

ADVISOR/MENTORSHIP PROGRAM

GOALS: During the third year, students have the opportunity to explore clinical specialties in greater depth with an emphasis on building clinical skills and understanding the practice rewards and demands of different specialties.

The Advisor/Mentorship program will begin at the beginning of the third year and continue throughout the remainder of the year with sessions corresponding with the student's Doctoring 3 schedule.

OBJECTIVES: The student will be provided with the opportunity to:

- Have personalized mentorship & advice
- Have observation and feedback on clinical skills
- Have an opportunity to integrate knowledge and skills throughout the entire year
- Have an opportunity to pursue interests and improve skills in clinical research
- Have an opportunity to "test drive" or explore potential career interests or improve skills in deficiency areas.

KNOWLEDGE: The student will:

1. Improve history-taking, physical examination skills, assessment and approach to the management of common clinical problems encountered in the practice setting or field:
    - Accuracy in collecting the pertinent history
    - Proficiency with the physical examination
    - Ability to conduct a focused work-up
    - Ability to present findings and assessment for discussion
2. Become familiar with the practical elements involved in clinical practice:
    - Qualities of clinical decision-making process
    - Skills needed for successful patient care
    - Rewards and demand of practice
    - Breadth and diversity of professional opportunities within a given specialty
3. Career exploration and development:
    - Opportunity to engage in mentored clinical research and improve skills as a physician-scholar
    - Opportunity for in-depth one on one mentorship within academic medicine
    - Option to continue research projects initiated during the first two years of medical school or to initiate research that may be carried into the 4th year.

ADVISORS/MENTORS: Advisors/Mentors will be assigned to students for the year. The faculty may be the primary care physician who is in their community based practices or other UC Riverside faculty. Students may request faculty preceptors but their assignment will need to be approved by the longitudinal clerkship director.

EVALUATION: The final evaluation for the Advisor/Mentorship program will be based on three components:

- Attendance at all of the preceptor sessions or designated make-ups
- Documentation that the student has been observed conducting a history and physical examination on at least one occasion per session for purposes of providing feedback.
- A passing grade for clinical performance from the Preceptor for each session. An end of session evaluation will be required.

CLINICAL FOUNDATIONS (2 WEEKS)

Students will meet for two weeks prior to beginning their third year required clinical clerkships. This will be an intensive clinical course that will provide students with a review of history taking, physical examination, introduction to clinical medicine, basic life support skills with certification, procedures and basic diagnostic skills. Additional topics will include patient safety, patient privacy, professionalism and medical ethics. Students will have their clinical skills updated so that they will be prepared to start the third year in the medical center-based clerkships or the community-based clerkships.

OBJECTIVES: Students will be prepared to:

- Discuss the proper technique to obtain a patient history
- Discuss the proper technique to obtain a patient physical examination
- Discuss important factors in radiology and describe the technique to review common x-rays: chest, abdominal, long bone, as well as a cross sectional MRI.
- Describe/Discuss the importance and techniques of CPR and airway management
- Demonstrate the ability to perform Infant CPR; Child CPR; Adult CPR; Airway Obstruction
- Demonstrate the ability to function in the role of a medical student with a patient suffering a cardiac arrest
- Discuss the technique for NG placement and Foley placement (unless we have a patient-simulator for students to demonstrate their abilities to do this)
- Discuss wound management
- Perform basic suturing and knot tying techniques
- Demonstrate the ability to draw blood on a patient
- Demonstrate the ability to start an intravenous line on a patient
- Discuss the procedure of arterial blood gases (ABGs) on a patient
- Describe the six steps of reading and demonstrate the ability to read ECGs
- Understand the importance of medical informatics
- Perform basic functions using a PDA
- Understand the importance of HIPAA requirements and patient privacy and confidentiality
- Describe aspects of safety (fire, overhead page announcements in case of an emergency, demonstrate knowledge of what to do in each situation).
- Understand the Student Health Services system and availability
- Discuss the function of Student Mental Health Services
- Describe the importance of a medical student's wellness in care of patients
- Discuss stresses a medical student will have during the 3rd year of medical school
- Discuss how power and gender abuse can affect medical students

- Discuss humanism and your role as a medical student
- Describe the expectations of a medical student during each clerkship
- Discuss secrets to being a successful 3rd year medical student
- Discuss important aspects of choosing a medical specialty

CLINICAL FOUNDATIONS - Topics to be covered:

1. History and Physical Examination
2. Basic Life Support – students will be certified
3. Airway management
4. PPD skin testing
5. Electrocardiogram reading
6. Chest, abdominal, musculoskeletal radiology
7. Cross sectional imaging
8. PDA in clinical settings
9. Clinical reasoning
10. Introduction to clinical research
11. Wound management and suturing
12. Phlebotomy skills; IV line placement; ABGs
13. Patient comfort, privacy and confidentiality
14. Pain management
15. Universal precautions

MEDICAL CENTER-BASED CLERKSHIPS

UC Riverside students will have 26 weeks in the third year of medical center-based clinical education. These clerkships will provide experience in inpatient and specialty care in clerkships in medicine, surgery, pediatrics, emergency medicine and neurology. Additionally there will be a 4 week clerkship in family medicine (ambulatory based).

The overall goals of the clinical medical center-based clerkships will be to:

- become intimately familiar with the day-to-day workings of medical center-based care
- become a member of a medical team and understand the roles of different team members in delivery of care
- meet educational milestones in a medical center environment
- instill confidence and professionalism
- develop the ability to become independent learners and problem solvers
- become responsible for patients who are acutely ill
- develop skills in communicating with patients, patient family and friends in an acute setting
- develop skills in addressing end of life issues

MEDICAL CENTER SITES: Students will be assigned to one or more medical center sites for their medical center-based clinical clerkships. All three of the following sites have indicated interest in becoming a teaching venue for the UC Riverside School of Medicine. However, these sites are not exclusive and other venues will be encouraged and explored as needs arise. The Riverside County Regional Medical Center is a county hospital and clinic, the Kaiser-Permanente Medical Center is a managed care-HMO center, and the Eisenhower Medical Center is a private hospital with all services. The description of each of the medical centers follows.

Riverside County Regional Medical Center

Riverside County Regional Medical Center (RCRMC) is a state-of-the-art tertiary care facility, which opened in March, 1998, in Moreno Valley, California. RCRMC is a general acute care hospital with a level II trauma center, 12 operating rooms and adult medicine, surgery, neurosurgery, pediatric, and neonatal intensive care units. RCRMC has a total of 362 general acute care beds: 44 intensive care beds, 40 peri-natal beds, 32 intensive care newborn nursery beds, 21 pediatric

beds and 225 general acute care beds caring for a broad spectrum of internal medicine, general surgery, orthopedics, neurosurgery, family medicine, and obstetrics & gynecologic patients. There is also a 24 hour basic emergency room and outpatient surgery program. RCRMC is also licensed for 77 acute psychiatric beds located at a separate building. There are approximately 23,000 inpatient admissions and 200,768 outpatient clinic visits per year. Since 1963, RCRMC has been a teaching hospital dedicated to the education of medical students and residents. The institution has residencies in Emergency Medicine, Internal Medicine, Family Medicine, Surgery and Surgical Subspecialties, Anesthesiology, and Radiology. RCRMC is approximately 12.5 miles from the University of California, Riverside (UCR).

Kaiser-Permanente Medical Center (Fontana or Riverside)

Kaiser-Permanente is a managed care organization. These medical centers have an average of 215 beds with distribution among a general acute medicine unit, ICU, CCU, neonatal ICU, pediatric unit and a perinatal unit. They have approximately 38,000 ER visits per year with approximately 9200 admissions per year. In addition to the inpatient hospital, specialty and subspecialty clinics are available. This institution is currently involved in graduate medical education. Kaiser Fontana is approximately 11.8 miles from the University of California, Riverside (UCR), and Kaiser Riverside is approximately 12.7 miles from UCR.

Eisenhower Medical Center

Eisenhower Medical Center is a private institution located in Rancho Mirage. Eisenhower Medical Center's inpatient service is comprised of 253 beds with a CCU, ICU, pediatric unit and general acute care beds. They have approximately 42,000 ER visits per year with about 10,000 admissions per year. This institution has a full complement of primary care, specialty and subspecialty care services. Eisenhower Medical Center is approximately 62.3 miles from UCR.

INTERNAL MEDICINE MEDICAL CENTER-BASED CLERKSHIP (8 WEEKS)

GOALS: The goal for students on this Inpatient Clerkship in Medicine will be the attainment of an understanding of adult patient illnesses and the non-surgical treatment of those illnesses. The emphasis of the clerkship will be directed toward the integration of basic science with clinical skills. An important component of the student's approach to the patient will be an awareness of the patient as an individual in an unfamiliar and stressful setting.

SKILLS:

- Achieve proficiency in the following:
    - obtaining the patient's history
    - performing a full or directed physical examination
    - writing up the data base in a problem-oriented format
    - presenting cases
    - performing basic diagnostic and therapeutic procedures
- Gain experience in writing orders and problem-oriented progress notes
- Learn how to establish priorities in ordering diagnostic tests and to interpret laboratory data
- Consider cost-effectiveness in patient evaluation
- Begin to develop judgment and decision-making skills
- Ascertain patient's goals of the therapeutic encounter
- Ascertain patient's understanding and compliance with medications
- Begin to understand the basic concepts and dilemmas in medical ethics
- Learn to communicate and interact with families and close relatives and friends of patients
- Research a patient's problem in a systematic manner, utilizing relevant medical literature and expert resources
- Learn to develop a cost effective workup and treatment plan

KNOWLEDGE:

- Develop familiarity with common medical illnesses. Develop the ability to construct an adequate differential diagnosis.
- Build on previous knowledge of pathophysiology and begin to integrate basic sciences with clinical medicine by reading pertinent texts about the problems of each patient

SURGERY MEDICAL CENTER-BASED CLERKSHIP (4 WEEKS)

GOALS: The overall goals of the surgery inpatient clerkship will be to introduce students to the principles of evaluation and management of general surgical patients.

SKILLS:

- Comprehensive evaluation of inpatients
- Comprehensive history and physical examination (H&P).
- Writing a well-organized and succinct H&P is important.
- Focused evaluation of outpatients
- Skills in the succinct oral presentation of the pertinent points

KNOWLEDGE:

- Diagnostic aspects of surgical diseases
- Familiar with a variety of diagnostic techniques peculiar to surgical illnesses
- Know about upper and lower gastrointestinal endoscopy, endoscopic and other biopsies, ultrasound examination for gallstone disease, abdominal CT scans, and various techniques for visualizing the biliary and pancreatic ducts (e.g., ERCP, transhepatic cholangiography).
- Surgical treatment of gastrointestinal diseases
- Learn the basic principles of diagnosis and treatment of a variety of surgical conditions including the indications for surgical treatment, the basic principles of pre-operative and operative management of each, risks and complications of surgery, and chances for success.
- Learn information about alternative forms of therapy

PEDIATRICS MEDICAL CENTERED-BASED CLERKSHIP (4 WEEKS)

GOALS: To acquire a fund of knowledge about acute pediatrics necessary for any physician regardless of his or her future area of interest.

SKILLS: Students will develop:

- The ability to take a thorough history from parents and children
- The ability to carry out a thorough physical examination and developmental assessment
- The ability to record the above in problem-oriented format
- Develop a diagnostic and treatment plan
- The ability to present the patient in a concise case presentation
- Skills in the performance of simple procedures
- The ability to interact with parents and relatives of ill pediatric patients

KNOWLEDGE:

- To gather, organize, and record health and illness data on pediatric patients in various age groups
- The ability to synthesize and analyze the information and to develop an approach to differential diagnoses
- The acquisition of knowledge about pediatric diseases and general approaches to patient management

EMERGENCY MEDICINE MEDICAL CENTERED-BASED CLERKSHIP (4 WEEKS)

GOALS: The goal for students in the Emergency Medicine Clerkship will be to evaluate and work up undifferentiated acutely ill patients. There will be an emphasis on understanding the use of health care resources, the role of multiple health professionals in the emergency department, and understanding of the indications for admission to the hospital for common illnesses.

SKILLS: Students will learn to:

- Perform a focused history and physical examination directed at the chief complaint.
- Perform procedural skills in IV placement; NG tube placement; Foley catheter placement; obtaining ABGs.
- Read and interpret chest x-rays and ECGs.
- Gain experience in writing orders.
- Begin to develop judgment and decision-making skills
- Learn to communicate and interact with families and close relatives and friends of patients.

KNOWLEDGE:

- Develop familiarity with common urgent and emergent illnesses.
- Develop the ability to construct an adequate differential diagnosis using the focused history and physical examination.
- Understand the indications for admission of patients to the hospital.
- Understand what diagnostic and laboratory tests are required to make a decision necessary for admission or discharge from the ED.
- Understand the need for follow-up after a visit of a patient to the ED and good communication with the primary physician.

NEUROLOGY MEDICAL CENTER-BASED CLERKSHIP (2 WEEKS)

GOALS: The goal of the neurology medical center-based clerkship is to provide the student with the skills and knowledge to evaluate and manage acute and chronic neurologic problems.

SKILLS:

- Acquire the ability to perform and document a full neurologic history and examination
- Localize a lesion based on history and exam findings
- Generate a differential diagnosis for acute neurologic complaints
- Learn to communicate and interact with families, close relatives and friends of patients

KNOWLEDGE:

- Develop a practical approach to the evaluation and management of acute neurologic complaints
- Recognize and appropriately respond to neurologic emergencies
- Manage ethical and psychosocial problems encountered in the care of neurologically-ill patients
- Develop an understanding of the rehabilitation of neurological disability

FAMILY MEDICINE MEDICAL CENTER-BASED CLERKSHIP (4 WEEKS)

GOALS: The primary goal of this clerkship is for students to provide continuing care for patients in the ambulatory setting.

SKILLS: Students will be able to:

- Perform problem-focused histories and physical examinations in the evaluation of patients presenting with acute and chronic problems
- Develop diagnostic and treatment plans appropriate to the ambulatory setting
- Refine their understanding and practice of health maintenance interventions
- Solidify their skills in communicating with patients
- Improve their note-writing and case-presentation skills
- Establish meaningful patient-physician relationships based on compassion and professionalism
- Begin to assimilate clinical judgment and decision-making skills
- Research a patient's problem in a systematic manner, utilizing relevant medical literature and expert resources

KNOWLEDGE:

- Understand the preventive measures that are supported by evidence based medicine and have the knowledge to provide health education to patients
- Understand how to prioritize the ordering of diagnostic tests and interpret laboratory data while considering cost-effectiveness in patient evaluation
- Understand the role of the family physician as a leader in coordinating various health care personnel in patient care.
- Recognize the common and complex problems seen in an outpatient setting by the practicing family physician.
- Integrate the concepts behind health maintenance and screening tests and use these in the promotion of health for patients aged 16 and over.
- Integrate knowledge of pathophysiology from the basic sciences to clinical ambulatory medicine.
- Be aware of the basic ecology of medical care and the principles of clinical epidemiology relevant to clinical practices.
- Demonstrate knowledge of gender and age specific preventive health measures, including screening tools and immunizations
- Students will develop an understanding and appreciation of cultural-based medicine.

COMMUNITY-BASED CLERKSHIPS

UC Riverside students will spend 26 weeks in the third year in community-based clinical education. These clerkships will provide experience in primary care and continuity with a patient centered focus. In addition to the longitudinal primary care experience, students will have community-based clerkships in surgery, pediatrics, obstetrics & gynecology and psychiatry. Additionally, they will have a community experience.

COMMUNITY-BASED CLINICAL SITES: Students will be assigned to one or more community sites for their community-based clinical clerkships. All five of the following sites have indicated interest in becoming a teaching venue for the UC Riverside School of Medicine, and staff at each of these sites currently participates in years 1 and 2 of the UCLA student curriculum based at Riverside. However, these sites are not exclusive and other venues will be encouraged and explored as needs arise. The Riverside Medical Clinic, the Beaver Medical Group, and the San Bernardino Medical Group are multi-specialty groups with the spectrum of primary, specialty and subspecialty care. The Riverside County Family Care Centers are Federally Qualified Health Center clinics operated by Riverside County through its Community Health Agency. Psychiatric services are not provided at the multi-specialty groups and we have identified a psychiatric group practice that has indicated interest in participating in the education of students (see below). The description of each of the groups follows.

Riverside Medical Clinic

The Riverside Medical Clinic is a multi-specialty group that started in 1935 and currently has approximately 110 physicians with about 50% in primary care. The group takes care of 225,000 patients located in two Riverside clinics, one Moreno Valley clinic, and one Corona clinic. The group has space for students to use examining rooms, has conference rooms, has an electronic medical record and is doing pay for performance quality improvement activities. The group has recently opened a new building that includes a PET scanner, MRI, CT, Bone Density, and the usual other imaging. In this new center is an oncology infusion center, surgical outpatient center and all subspecialties including pediatric subspecialties. This group delivers approximately 100 babies per month. Additionally, this group has an urgent care center.

The Riverside Medical Clinic is very interested in participating with the UC Riverside School of Medicine and would like to be involved in the education of both students and residents. The Riverside clinic is located 7 miles from the UC Riverside campus.

Beaver Medical Group

The Beaver Medical Group is a multi-specialty group that started in 1945 and currently has 159 physicians with 86 in primary care and 73 specialists and sub-specialists. The group takes care of 100,000 managed care patients and about twice that number in regular insurance based care. They currently have 9 clinical sites with large facilities in Highland, Redlands, Yucaipa and Banning with conference rooms and some rooms for students. Major radiologic procedures (PET, CT, MRI) are done at Redlands Community Hospital with electronic transmission of reports. There are 10-11 pediatricians in this group, and the OB-GYN group delivers about 200 babies per month. This group also has an urgent care center that sees between 50 and 75 patients a day providing students with opportunities to see undiagnosed patients.

The Beaver Medical Group is interested in participating with the UC Riverside School of Medicine and would like to be involved in the education of both students and residents. The main Beaver clinic is located 15 miles from the UC Riverside campus.

San Bernardino Medical Group

The San Bernardino Medical Group is a multi-specialty group that started in 1954 and currently has 20-22 physicians in primary care and 5-6 specialists. Most of the specialty care for this group is done under contract by other community physicians. This group is mostly primary care with family physicians or general

internists. They provide care to a large group of patients. They do not provide psychiatric or obstetrical care. This group has clinical space for students as well as conference room space. Major radiologic and diagnostic facilities are at St. Bernadine's Medical Center which also has excellent ICU facilities. This group will provide the students with exposure to a smaller, more community oriented practice.

The San Bernardino Medical Group is interested in participating with the UC Riverside School of Medicine and would like to be involved in the education of both students and possibly residents. The main San Bernardino practice is located 15 miles from the UC Riverside campus.

Riverside County Family Care Centers

There are ten Federally Qualified Health Center (FQHC) clinics operated by Riverside County through its Community Health Agency. The tenth clinic opened in Rubidoux on March 5, 2007. These clinics, referred to as the Riverside County Family Care Centers provides more than 112,000 patient visits a year to populations where approximately 74% speak Spanish as their primary language. Primarily serving those with Medi-Cal and Healthy Families, as well as the uninsured, this network of clinics provides an unparalleled community based clerkship experience.

PSYCHIATRIC CLINICAL CARE: None of the above multi-specialty groups provide psychiatric care. The Riverside Center for Behavioral Medicine and Psychiatric Medical Group will initially be used as the primary community-based psychiatry clerkship. The group description follows:

Riverside Center for Behavioral Medicine and Psychiatric Medical Group

The Psychiatric Medical group is composed of a staff of 14, with 6 psychiatrists, 2 psychologists, an acupuncturist, social workers and nursing staff. This group

owns the Riverside Center for Behavioral Medicine which is a non-locked psychiatric facility. Students will have the opportunity to be involved with outpatient psychopharmacology, group therapy, chemical dependence rehabilitation and also have exposure to acute inpatients and long term outpatients. In the ambulatory setting, this group delivers care to a cross-section of the population and is planning on opening a residential program for women. Additionally, this group covers a local nursing home to address gero-psychiatric issues.

The Riverside Center for Behavioral Medicine is a 68 bed hospital with 10-25 beds for acute psychiatry, 6-15 beds for patients with chemical dependence and 5-10 research beds for 2nd and 3rd stage drug trials. The acute care stay averages about 9-10 days.

The Riverside Psychiatric Medical Group is interested in participating with the UC Riverside School of Medicine and would like to be involved in the education of both students and possibly residents. The group is located 6 miles from the UC Riverside campus.

INTERNAL MEDICINE or FAMILY MEDICINE COMMUNITY-BASED CLERKSHIP (2 weeks followed by 1 half day per week of primary care)

GOALS: The primary goal of this clerkship is for students to provide continuing care for patients in the ambulatory setting.

SKILLS: Students will be able to:

- Perform problem-focused histories and physical examinations in the evaluation of patients presenting with acute and chronic problems
- Develop diagnostic and treatment plans appropriate to the ambulatory setting
- Refine their understanding and practice of health maintenance interventions
- Solidify their skills in communicating with patients
- Improve their note-writing and case-presentation skills
- Establish meaningful patient-physician relationships based on compassion and professionalism
- Begin to assimilate clinical judgment and decision-making skills
- Research a patient's problem in a systematic manner, utilizing relevant medical literature and expert resources

KNOWLEDGE:

- Understand the preventive measures that are supported by evidence based medicine and have the knowledge to provide health education to patients
- Understand how to prioritize the ordering of diagnostic tests and interpret laboratory data while considering cost-effectiveness in patient evaluation
- Understand the role of the physician as a leader in coordinating various health care personnel in patient care.
- Recognize the common and complex problems seen in an outpatient setting by the practicing internist or family physician.
- Integrate the concepts behind health maintenance and screening tests and use these in the promotion of health for patients aged 16 and over.
- Integrate knowledge of pathophysiology from the basic sciences to clinical ambulatory medicine.
- Be aware of the basic ecology of medical care and the principles of clinical epidemiology relevant to clinical practices.
- Demonstrate knowledge of gender and age specific preventive health measures, including screening tools and immunizations
- Students will develop an understanding and appreciation of cultural-based medicine.

SURGERY COMMUNITY-BASED CLERKSHIP (4 WEEKS)

Students will be assigned to a general surgeon for the clerkship. They will receive a beeper and be on call with the surgeon during the course of the 4 weeks. The student will be with the surgeon in his/her surgical evaluation clinic, ambulatory surgery site or inpatient surgical OR.

GOALS: The overall goal of the community-based surgery clerkship will be to introduce students to the principles of evaluation and management of ambulatory surgical patients.

SKILLS:

- Comprehensive and focused evaluation of out-patients
- Comprehensive history and physical examination (H&P).
- Writing a well-organized and succinct H&P.
- Skills in the succinct oral presentation of the pertinent points
- Skill in managing minor ambulatory surgery procedures
- Suturing for minor and major surgery

KNOWLEDGE:

- Diagnostic aspects of surgical diseases
- Familiar with a variety of diagnostic techniques peculiar to surgical illnesses
- Ambulatory and inpatient treatment of surgical illnesses.
- Learn the basic principles of diagnosis and treatment of a variety of surgical conditions
- Indications for surgical treatment, the basic principles of pre-operative, operative and post-operative management of each, risks and complications of surgery, and chances for success.
- Learn information about alternative forms of therapy
- Prevention of common surgical problems, such as hernias (direct and indirect), discitis, rotator cuff tears, etc.

OBSTETRICS & GYNECOLOGY COMMUNITY-BASED CLERKSHIP (6 WEEKS)

GOALS: The goals of the clerkship is to acquaint the student with the varied aspects of the medical care for women, acquire the basic skills of gynecologic and obstetrical history and physical examination and assume responsibility in the evaluation and care of obstetrical and gynecologic patients.

SKILLS: At the end of the clerkship, students should be able to:

- Do a gynecologic examination
- Evaluate a pregnant woman
- Take cervical specimens and diagnose sexually transmitted diseases
- Assess results of mammograms and bone density tests
- Acquire practical experience in the operating and delivery room areas with close supervision by the staff.

KNOWLEDGE:

- Understand the different stages of pregnancy
- Understand different sexually transmitted diseases and their treatment
- Understand the prevention of cervical and ovarian cancer and its treatment
- Understand different cultural approaches to birth control
- Be able to counsel patients regarding family planning and birth control.

PEDIATRICS COMMUNITY-BASED CLERKSHIP (4 WEEKS)

GOALS: At the end of the clerkship, students will be able to approach pediatric and adolescent patients and have an understanding of the medical, psychological and growth related issues.

SKILLS:

- The ability to perform thorough physical examination and developmental assessment
- The ability to record the above in a problem-oriented format
- Recognize the “sick child”
- The ability to formulate a plan of evaluation with critical use of the laboratory and other diagnostic studies with justification (medical and financial)
- The ability to interact with parents and relatives of the patient

KNOWLEDGE:

- Review the pathophysiology and background information about disease entities encountered and the effects of disease on the developing child.
- Acquire basic knowledge of the appropriate developmental tasks of each stage of childhood and their importance in clinical care
- Identify early signs of mental retardation and cerebral palsy
- The ability to synthesize and analyze the information and to develop an approach to differential diagnoses

PSYCHIATRY COMMUNITY-BASED CLERKSHIP (4 WEEKS)

GOALS: The goals of the community-based psychiatry clerkship will be to enhance students' understanding of ambulatory psychiatric illnesses, and to introduce the understanding of psychotherapy, group therapy and use of psychopharmacology in the current clinical applications of modern neuroscience. The goal is to provide students with the psychiatric knowledge essential for the general practice of medicine.

SKILLS: At the end of the clerkship, students should be able to:

- Recognize the signs and symptoms of common psychiatric diseases including depression, anxiety, delirium, dementia, personality disorders, eating disorders, and substance abuse disorders.
- Perform and interpret a mental status exam and clinical interview.
- Present the results of a comprehensive psychiatric history and evaluation orally and in writing.
- Work in a multidisciplinary team with good, professional interactions.

KNOWLEDGE:

- Know the diagnostic criteria and effective interventions for common psychiatric illnesses.
- Understand the benefits and side effects of the common psychopharmacological interventions.
- Understand the value of psychotherapy (both individual and group)
- Understand the indications for electroconvulsive therapy for severe and non-responding depression.
- Design an appropriate treatment plan, which reflects awareness of the patient, family and community resources, as well as knowledge of behavioral and psycho-pharmacological interventions.
- Describe the legal and ethical issues raised by psychiatric conditions in medical and psychiatric settings.

COMMUNITY EXPERIENCE (4 WEEKS)

GOALS: The goals of this community experience are to have the student obtain experience and knowledge about delivering care to people in underserved areas. Experiences could be at:

- The Indian Health Service or clinics
- Riverside or San Bernardino Departments of Health
- Free clinics
- Latino community centers
- Rural health centers
- Other

Students will be expected to ask a question that would be answered at the end of their experience. All students would present either an oral or poster presentation of their experience at the end of the year at the 3rd Year Student Scholarship day. All faculty and other students would be invited to the presentations. This presentation would be a requirement for advancement to the fourth year.

SELECTIVE (2 WEEKS)

GOALS: Students will have an opportunity to take a 2 week clinical selective in an area of interest. Selectives could be in dermatology, radiology, pathology, medical or surgical specialties, urgent care, etc. Clerkship directors would develop goals, skills and knowledge that the student would obtain during the two week period of time.

FOURTH YEAR CURRICULUM OVERVIEW:

The fourth year will start after the completion of the third year. The fourth year will be approximately 10 months in length. There will be 4 months of electives of which 2 months will be inpatient based. The rest of the year will be structured with required clinical courses, selectives, a scholarly project, community service and involvement, and a seminar series that focuses on return to the basic sciences as well as other general topics. Students will choose an academy and will fulfill the 4th year requirement through involvement with the academy.

ACADEMIES:

Students and faculty members interested in common career activities will be grouped into academies during year four. Students will chose which academy they would like to be affiliated with during the latter part of year three. The academies can be thought of as a society of faculty and students with the goal of providing career advice and mentoring, providing longitudinal experiences through preceptorship and creative projects, providing direction for electives and selectives, assuring completion of fourth year requirements and being a base for the development of a senior project.

The academies will provide the student with a means of further honing clinical skills and clinical judgment, and to stimulate discussion of new findings in the basic, social and clinical sciences relevant to the future practice of medicine. The academy activities will include an introductory course focused on advanced clinical skills and decision making, a monthly series of evening seminars, a longitudinal community-based activity, a longitudinal scholarly activity and regular advisory meetings.

Initially there would be four academies:

- Community –Primary Care: students with interest in family medicine, internal medicine, pediatrics, obstetrics and gynecology, neurology, and psychiatry would consider this academy. Themes include prevention, mental health, international health, geriatrics, women's health and health care for the underserved.
- Acute Care: students with interest in careers in emergency medicine, anesthesia, Hospitalist medicine, adult critical care specialties (cardiology, pulmonary medicine) and pediatric critical care (cardiology; neonatology) would consider this academy. The themes of this academy include time-based decision making, physiologic correlations, and crisis management.
- Applied Anatomy: students with interest in surgery & surgical specialties, radiology & radiation Oncology, pathology, and dermatology would consider this academy. The unifying theme is anatomical implications in medical practice.

- Medical Sciences: students with interest in research or subspecialty training programs that require research would consider this academy. The theme is the development of skills in basic and clinical research.

Each academy will have a faculty director who, with an advisory committee, would develop the mission, goals and objectives for their specific academy. The Academy Director will be responsible for assuring that students meet the graduation competencies and are prepared for an internship.

Each Academy will be responsible for sponsoring required seminars that will address specific issues applicable to all students. Such topics could include:

- Back to basic science
- Health disparities and underserved populations
- Elder abuse
- Violence and its impact on communities
- Women's health
- Preventive medicine
- Business and financing of medicine
- Different systems of health care
- Medical Informatics and telemedicine
- Geriatrics; end of Life care and pain management
- Legal/risk management; patient safety; teamwork.
- Clinical decision-making

REQUIRED EXPERIENCES:

Clinical Clerkships or Sub-Internships: Students will be required to have clinical experiences in the following areas:

- Advanced Inpatient Clerkship in Internal Medicine (4 weeks)
- Advanced Clerkship in surgery or its subspecialties (4 weeks)
- Advanced Clerkship in Acute Medicine (ER; ICU;) (4 weeks)
- Community Based Medicine: Ambulatory surgical centers, OB-GYN, Pediatrics, Family Medicine, ambulatory IM or IM subspecialties (4 weeks)

Community Project: In addition to the above required clinical experiences, the students will develop a project that involves the community, and particularly underserved areas. This could be a clinical or academic longitudinal experience, and may include teaching activities, research or direct patient care. Students may also continue the community project they were involved in during year three. The determination of the number of half days per week and number of weeks would be based on the project and other experiences. A cumulative minimum of 4 weeks will be necessary to fulfill this requirement.

Scholarly Project: The purpose of the scholarly project is to develop:

- Skills in asking questions in clinical or basic investigation
- Writing about and verbally presenting ideas
- Intellectual collaboration with a mentor

Students may chose a topic or prepare results from their community project to fulfill this requirement. All projects must be approved by the Academy Director. The project may be longitudinal across the entire fourth year or directly relate to the student's community project. Abstracts of projects will be presented at the senior scholarship day.

Web-based cases and clinical problems will be utilized during the third and fourth year for all clinical rotations. Tele-education and teleconferencing will assure that all students in clinical sites will have some consistency in their education.

EVALUATION:

In addition to evaluations in each of the clerkships, students will have focused case-based evaluations, OSCE's, and take Part II of the National Boards at the end of the 4th year.

BIOMEDICAL SCIENCES FACULTY BRIEF BIOS

Craig V. Byus, Ph.D. – received a Ph.D. degree in 1974 from the University of New Hampshire. Dr. Byus was a Research Associate in the Pharmacology Department at the University of Arizona Medical School, Tucson. He was the recipient of the National Research Service Award while at the University of Arizona. In 1977, Dr. Byus began as an Assistant Professor in the Division of Biomedical Sciences and Biochemistry. He currently serves as Dean and Program Director at the Professor level at UCR in the Division of Biomedical Sciences. He is also a Professor in Biochemistry. Dr. Byus' research is concerned with the molecular mechanisms involved in the regulation of cell growth and proliferation, particularly as this process relates to cancer. Various important enzyme systems involved with polyamine metabolism are being studied with biochemical and molecular biological techniques in order to design both nutritional and new drug therapies for the prevention and treatment of cancer.

Monica Carson, Ph.D. – received a Ph.D. degree in 1990 from the University of Pennsylvania. In 1999, she was appointed Assistant Professor in the Department of Molecular Biology at The Scripps Research Institute. Dr. Carson serves on an NIH study section, is a Councilor for the American Society for Neurochemistry, and is the program chair for the society's 37th annual meeting. She is currently an Associate Professor in the Division of Biomedical Sciences at UCR. Dr. Carson's research focuses on the role of microglia in the normal and pathologic state. She is the first to recognize the important dual role that these microglia may play in neuroprotection or neurodegeneration.

Kathryn DeFea, Ph.D. – received a Ph.D. degree in 1994 in Endocrinology from the University of California, San Francisco. She was a Postdoctoral Fellow from 1994 to 1997 in the Department of Molecular Pharmacology, Stanford University, Palo Alto, CA; from 1997 to 2000 was a Postdoctoral Fellow in the Department of Surgery at the University of California, San Francisco; and was appointed as Assistant Professor in the Division of Biomedical Sciences at UCR. Dr. DeFea's research is concerned with how different G-protein coupled receptors can utilize protein scaffolding complexes to direct the subcellular localization, and thus the downstream effects, of MAPK activation. She has purified two such complexes: one that is induced upon activation of Protease Activated Receptor 2 (PAR2), leading to cytoskeletal rearrangements and cell motility and another that forms in response to activation of Neurokinin-1 receptor (NK1R), leading to mitogenesis and protection from apoptosis. Current studies focus on identification of substrates for these complexes. In the case of PAR2, one substrate is SCAR-1, a protein that mediates lamelipodia formation in motile cells. She is also investigating the role of PAR2-induced cytoskeletal changes in tumor metastasis, as both the receptor and its natural activator are highly expressed in metastatic tumor cells. A second project involves the biochemical dissection of these complexes and identification of the mechanisms by which they are able to direct such distinct physiological responses. A third project investigates the ability of NK1R to activate opposing MAPK cascades, in a cell cycle dependent fashion, and the role of specific scaffolding complexes in directing which pathway is activated under different conditions.

Douglas Ethell, Ph.D. – received a Ph.D. degree in 1993 from the University of British Columbia, Vancouver, B.C. in Developmental Neurobiology; from 1993 to 1996 was a Postdoctoral Scientist at the Max Planck Institute for Psychiatry, Martinsried, Germany; from 1996 to 1997, was a Postdoctoral Scientist in the Department of Neurobiology, The Scripps Research Institute in La Jolla, CA; from 1997 to 1999 was a Postdoctoral Scientist in the Department of Cell Death and Aging, the Burnham Institute, La Jolla, CA; from 1999 to 2001 was a Postdoctoral Scientist in the Division of Cellular Immunology, La Jolla Institute for Allergy and Immunology, San Diego, CA; and in 2001 was a Research Scientist in the Division of Cellular Immunology, La Jolla Institute for Allergy and Immunology, San Diego, CA. Dr. Ethell is currently an Assistant Professor of Biomedical Sciences at UCR. Dr. Ethell's research focuses on how brain cells die in disorders such as Alzheimer's disease, stroke, diabetic neuropathy, and Multiple Sclerosis. All cells in our bodies are capable of triggering a kind of cellular suicide, called apoptosis. This kind of proactive cell death is very important in eliminating damaged, pre-cancerous, infected, superfluous, or otherwise unwanted cells from the body. However, inappropriate activation of apoptosis in brain cells can eliminate important neurons and lead to clinical deficits. It has been suggested that most neurodegenerative disorders result from such inappropriate apoptosis. He is investigating how apoptotic cell death is activated and controlled in neurons and other brain cells, as it relates to the disorders detailed above. For example, he has found that an apoptotic trigger thought to be used exclusively by the immune system, may in fact be responsible for the progression of Alzheimer's disease. The amyloid plaques that develop in Alzheimer's brain may be interpreted as a breach of the blood brain barrier by neurons in the local area. The neurons respond to this breach by producing large amounts of Fas ligand, perhaps to limit the immune system from damaging them. This high amount of Fas ligand will kill many of the immune cells that come into the area and so suppress any possible immune response to the amyloid plaques. Further, the high amounts of Fas ligand may directly kill the neurons themselves. Conversely, too little Fas ligand may be just as bad by allowing the immune system too much access to the brain and spinal cord. In this instance the immune system may create immune responses to viable brain cells as happens in Multiple Sclerosis. In addition to studying Fas ligand as a regulator of immune access to the CNS, he is also studying the activation of neuron apoptosis in stroke and diabetes.

Iryna Ethell, Ph.D. – received a Ph.D. degree in 1991 from Dnipropetrovsk State University, Ukraine. From 1993-1994 was a Postdoc in Molecular Cell Biology at Montreal Neurological Institute, McGill University, Canada; from 1995-1996 was a Postdoc in Neuroscience, Molecular Cell Biology at Max Planck Institute for Psychiatry, Martinsried, Germany; and from 1996-2001 was a Postdoc in Molecular Cellular Biology, Neuroscience, Glycobiology at Burnham Institute, La Jolla, CA. Dr. Ethell became a member of the Division of Biomedical Science in 2002 and is now an Associate Professor of Biomedical Sciences within the Division. Dr. Ethell's research focuses on studies of the molecular mechanisms that trigger dendritic spine formation. Dendritic spines are small protrusions on dendrites that serve as sites for excitatory synapses. Understanding the molecular basis of dendritic spine formation is fundamentally important to a variety of inherited developmental disorders associated with mental retardation and autism. Such disorders include Rett Syndrome, Down Syndrome, Angelman's Syndrome, and Fragile X Syndrome. Patients with these disorders exhibit malformation of dendritic spines. These

abnormalities result in synaptic dysfunctions, mental retardation and autism. Recently, she has found that dendritic spine morphogenesis is controlled by the EphB-type receptor tyrosine kinases. Using GFP and recombinant DNAs in combinations with immunocytochemistry and confocal or two-photon microscopy, she has shown that EphB-type receptors regulate dendritic spine formation in cultured hippocampal neurons. Moreover, she has shown that EphB2 receptor phosphorylates and induces clustering of syndecan-2 (cell surface heparin sulfate proteoglycan) on postsynaptic membranes. Further, she has cloned novel synaptic syndecan-2 binding protein, synbindin that shares homology with proteins involved in vesicular transport and exocytosis. Her future research will focus on investigation of molecular mechanisms through which EphB receptors trigger spine mophogenesis. She will also study the role of synbindin in vesicular transport and exocytosis in dendritic spines using various molecular and cell biology tools.

David A. Johnson, Ph.D. – received a Ph.D. degree in 1978 in Pharmacology at the University of California, San Francisco; from 1982 to 1983 was a Postgraduate Research Pharmacologist and Lecturer in the Department of Medicine, University of California, San Diego; in 1984 was appointed Assistant Professor in the Division of Biomedical Sciences, UCR, Associate Professor in 1991 and Professor in 1996 in the Division of Biomedical Sciences at UCR. Dr. Johnson's research focuses on Quantitative Fluorescence Spectroscopic Analysis of Protein Structure and Dynamics. The central focus of his laboratory is toward the development and the use of quantitative fluorescence spectroscopic methods to understand at a molecular level how drugs and proteins work. Three systems are currently being examined: the nicotinic acetylcholine receptor (AcChR), cAMP dependent protein kinase (PKA), and acetylcholinesterase (AcChE). Specific objectives include: determination of the sites of binding of agonists and inhibitors of the AcChR; molecular mechanisms of action of agonists and noncompetitive inhibition of the AcChR; and the nature and functional significance of conformational flexibility of the AcChR, PKA, and AcChE.

David Lo, MD, Ph.D – received a Ph.D. degree in 1986 from the University of Pennsylvania; an MD degree in 1986 from the University of Pennsylvania; was a Postdoc from 1986 to 1989 at the University of Pennsylvania School of Veterinary Medicine, Philadelphia; from 1989 to 1994, was an Assistant Member, Department of Immunology, Scripps Research Institute; from 1991 to 2000 was appointed Assistant Professor (and Associate Professor in 1994) at Scripps Research Institute Graduate program in Molecular and Cellular Structure and Chemistry; from 2000 to 2004, served as Vice President, Integrative Biology, Digital Gene Technologies, Inc., La Jolla, CA; in July of 2004 was the Director of Vaccine Technology, Neurome, Inc., La Jolla, CA; and in September 2004, was a Member, Division of Developmental Immunology, La Jolla Institute for Allergy and Immunology, La Jolla, CA. In October 2006, was appointed as a Distinguished Professor of Biomedical Sciences, at UCR. Dr. Lo's research focuses on the triggering and regulation of T cell responses in vivo. This began from an ongoing interest on the selection of the T lymphocyte repertoire in the thymus and the role of autoreactive T lymphocytes in immune regulation and autoimmune disease. His studies on the selection of the T lymphocyte repertoire in the thymus have primarily addressed the role of specific stromal cell subsets in the thymus tissue that are responsible for selection of T lymphocytes at different stages in their development.

Christian Y. Lytle, Ph.D. – received a Ph.D. degree in 1988 from Duke University, Durham, NC. From 1988 to 1989, he was a Postdoctoral Fellow at the University of California School of Medicine, Davis, CA: from 1989 to 1992, he was a Postdoctoral Fellow at Yale University School of Medicine, Department of Physiology, New Haven, CT; a Research Associate from 1992 to 1993 at Yale University School of Medicine, and became an Assistant Professor in 1993 in the Division of Biomedical Sciences. He is currently an Associate Professor of Biomedical Sciences within the Division. Dr. Lytle's research strives to understand the molecular mechanisms by which animal cells perceive and regulate their fluid volume. Studies focus on a family of proteins that transport salt across the cell membrane in response to subtle changes in cell volume. He employes a combination of biochemical, physiological, and molecular biological techniques to define the breadth of the physiological functions performed by Na-K-2Cl cotransporters and K-Cl cotransporters and the nature of the kinases and phosphatases which control them. Another interest is gastric acid secretion. Although it is now axiomatic that parietal cells secrete HCl, a growing body of evidence indicates that these cells undergo major morphological, biochemical, and functional changes as they migrate down the gastric gland. To clarify the biochemical nature and physiological purpose of this transformation, he is using immunocytochemical methods to map migration-associated alterations in secretory machinery, along with microscopic techniques to visualize regional differences in proton, chloride, and fluid transport within different segments of a single gland.

Paul M Quinton, Ph.D. – received a Ph.D. degree in 1971 in Cell Biology from Rice University, Houston, TX. Between 1971 and 1973 was a Postgraduate Research Physiologist at UCLA Medical School; from 1973 to 1975 was an Assistant Research Physiologist in the Department of Physiology at UCLA Medical School; from 1975 to 1979 was an Assistant Professor (In Residence) in the Departments of Physiology and Medicine at UCLA Medical School; from 1978 to 1979 was an Assistant Professor (Visiting) in the Department of Physiology, Harvard Medical School; became an Assistant Professor of Biomedical Sciences at UCR. Dr. Quinton is currently a Professor of Biomedical Sciences at UCR. Dr. Quinton's laboratory is located in the research complex of the UCSD Hillcrest Hospital in San Diego. He focuses on the basic defects and malfunctions associated with the fatal, hereditary disease cystic fibrosis (CF). Biomedical research activity on CF has exploded during the past decade such that virtually all areas of medical science have been brought to bear in this disease. His expertise is in fluid and electrolyte transport which means that he utilizes electrophysiological techniques to explore these problems; He also employes ratiometric fluorescence, immunocytochemical and molecular biology approaches as well. He generally investigates freshly isolated human tissues. Current areas of investigation include: G-protein control of ion channels, the composition and control of human airway fluids, and processes controlling HCO3- movements through the anion channel affected in cystic fibrosis, CFTR.

Neal L. Schiller, Ph.D. – received a Ph.D. degree in 1976 in Microbiology from the University of Massachusetts, Amherst. From 1976 to 1978 he had a Research Fellowship in Venereal Diseases, Division of Infectious Diseases, Department of Medicine, New York Hospital, Cornell Medical Center, New York City; in 1979 became an Assistant Professor of Biomedical Sciences (Medical Microbiology) and of Biology, UCR; from 1985 to 1986 was a Visiting Scientist, Laboratory of Clinical

Investigation, N.I.A.I.D., N.I.H, Bethesda, MD; from 1996 to present became Professor of Biomedical Sciences (Medical Microbiology), UCR; from 1994 to 1997 was Chair, Graduate Program in Microbiology, UCR; from 1995 to 2000, was the Associate Dean, Graduate Division, UCR; and from 2000 to 2003 was the Interim Dean, Graduate Division, UCR. Since 2003, Dr. Schiller has been the Associate Dean, UCR/UCLA Thomas Haider Program in Biomedical Sciences at UCR. On June 9, 2006, Dr. Schiller became a member of the UCR Academy of Distinguished Teachers. Dr. Schiller's research focuses on the study of the interaction of bacterial pathogens with human host defenses; analysis of the microbial physiology, genetics, immunobiology and pathogenesis of Pseudomonas aeruginosa infection in cystic fibrosis patients; characterization of antibiotic resistance in Helicobacter pylori; study of the antimicrobial activity of various cationic proteins.

John Y-J. Shyy, Ph.D. – received a Ph.D. degree in 1987 in Biochemistry from Ohio State University. From 1987 to 1991, was a Postdoctoral Fellow at The Ohio State University, Columbus, OH; from 1991 to 1999, a Research Scientist at the University of California, San Diego, La Jolla, CA; and in 1999 was appointed Associate Professor of Biomedical Sciences, at UCR, and promoted to Professor of Biomedical Sciences in 2004. Dr. Shyy's research focuses on elucidating the molecular mechanisms by which fluid shear stress and mechanical stretch activate gene expression in cells in the cardiovascular system. A variety of devices have been designed and engineered to subject a monolayer of cultured endothelial cells, vascular smooth muscle cells, and cardiac myocytes to well-defined mechanical forces. These include a rectangular flow channel with a uniform shear stress, a tapered flow channel with shear stress varying along the channel length, a step flow channel with disturbed flow patterns to stimulate vessel branch regions, and a cyclic stretch device to apply uniform biaxial strain to simulate oscillatory pressure. The expression of a number of genes related to atherogenesis, hypertension and hypertrophy, as well as the upstream signal transduction in response to variations in the magnitude of shear stress and stretch and flow pattern is studied.

Daniel S. Straus, Ph.D. – received a Ph.D. degree in 1972 in Biochemistry from the University of California, Berkeley; from 1972 to 1974 he was a Staff Fellow, Mutagenesis Branch, National Institute of Environmental Health Sciences; from 1974 to 1976, a Postdoctoral Research Fellow, Sir William Dunn School o Pathology, University of Oxford; became an Assistant Professor of Biomedical Sciences and Biology in 1976; Associate Professor of Biomedical Sciences and Biology in 1982; and Professor of Biomedical Sciences and Biology in 1988. He was Acting Associate Director of the Division of Biomedical Sciences from 1994 to 1995; and Interim Director and Associate Dean of the Division of Biomedical Sciences from 1995 to 1996. Dr. Straus' research focuses on: the molecular mechanisms for regulation of mammalian gene expression, mechanisms for regulation of cyclin expression in breast cancer cells by anti-neoplastic prostaglandins and retinoids, and studies on regulation of serum albumin and insulin-like growth factor-I (IGF-I) gene expression by nutrients, cytokines, and hormones.

Ameae M. Walker, Ph.D. – received a Ph.D. degree in 1976 in Cell Biology from Liverpool University, England. From 1976 to 1979 was a Research Staff Cell Biologist at Yale University School of Medicine, Section of Cell Biology, New Haven, CT. Dr. Walker was appointed as an Assistant Professor in the Division of Biomedical Sciences in 1979. On June 9, 2006, Dr. Walker became a member of the UCR Academy of Distinguished Teachers. She is currently a Professor of Biomedical Sciences at UCR and Chair, Academic Personnel, Division of Biomedical Sciences. Dr. Walker's research is concerned with the growth factor activities of the hormone prolactin. These growth factor activities occur in many tissues including the pituitary, breast, endocrine pancreas, liver, prostate, and cells of the immune system. Although most prolactin is produced by the pituitary, some is produced in these other tissues where it may act as an autocrine or paracrine growth factor. In four of these tissues she has demonstrated antagonism between unmodified and phosphorylated prolactin in the regulation of growth, an antagonism which can be disturbed, leading to abnormal cell proliferation. In the case of the prostate, she has demonstrated that a molecular mimic of phosphorylated prolactin effectively inhibits metastases and growth of the primary tumor of late stage human prostate cancer cells in an animal model. Clinical trials will begin shortly. Other projects include effects of the molecular mimic on the development and progression of breast cancer and pituitary tumors. Thus she investigates the posttranslational modification of prolactin, the regulation of prolactin release, prolactin-receptor interactions, signal transduction and effects on gene transcription in each of these tissues. Her laboratory uses a wide spectrum of techniques ranging from microscopy to molecular biology to whole animal physiology, each of which may be applied to answer a particular question.

CLINICAL FACULTY LIST

The following clinical faculty appointments were made with adherence to the UCR Biomedical Sciences Program Guidelines and approved by the UCR Biomedical Sciences Program Clinical Appointments and Advancements Committee. Their appointment levels at UCR are listed below. More complete biographical sketches, including professional affiliations, can be found in the section following.

Aguilera, Adolfo MD	Assistant Clinical Professor
Aoyagi, Y. Paul MD	Associate Clinical Professor
Atkinson, Roscoe D. MD	Clinical Professor
Bhupathy, A. Raja DO	Assistant Clinical Professor
Blakely, Patricia MD	Assistant Clinical Professor
Bolger, Ann F. MD	Clinical Professor
Bricker, Neal S. MD	Clinical Professor
Carter, H. Mark MD	Assistant Clinical Professor (expected 2007)
Chandiok, Suvesh MD	Associate Clinical Professor
Chen, Adam MD	Assistant Clinical Professor
Combs, Walter F. MD	Assistant Clinical Professor
Compton, Alan C. MD	Associate Clinical Professor
Cone, Lawrence A. MD	Clinical Professor
Corr, Andrew P. MD	Assistant Clinical Professor
Dasika, Vinod K. MD	Associate Clinical Professor
Dey, Jr., Samuel E. MD	Associate Clinical Professor
Dinh, Tien N. MD	Assistant Clinical Professor
Evans, James T. MD	Associate Clinical Professor
Gates, Donald G. DO	Associate Clinical Professor
Greer, Jonathan R. MD	Assistant Clinical Professor
Haider, Thomas MD	Associate Clinical Professor
Hammond, Laura A. Ph.D.	Associate Clinical Professor and Associate Adjunct Professor
Harris, Leita MD	Assistant Clinical Professor
Havens, Fred Z. MD	Assistant Clinical Professor
Ho, Hai MD	Assistant Clinical Professor
Hoang, Thanh Vincent Duy MD	Assistant Clinical Professor
Horstmann, Jonathan W. MD	Associate Clinical Professor
Howard, Frank D. MD	Associate Clinical Professor
Huang, Galen C. L. MD	Associate Clinical Professor
Hubbard, Andrew M. MD	Associate Clinical Professor
Hunt, William P. MD	Associate Clinical Professor
Huynh, Dean N. MD	Assistant Clinical Professor
Hwang, James S. DO	Associate Clinical Professor
Ibrahim, Emad MD	Assistant Clinical Professor
Jafri, Asma B. MD	Clinical Professor
Junkert, Jr., William E. MD	Clinical Professor
Karody, Ramesh MD	Associate Clinical Professor
Kim, Daniel MD	Associate Clinical Professor
Krishnan, Rajagopal MD	Clinical Professor
Lanum, David A. MD	Assistant Clinical Professor

Larson, Steven E. MD	Clinical Professor
Laughlin, Sharon M. MD	Associate Clinical Professor
Loo, Lawrence K. MD	Clinical Professor
Machuca, Javier L. MD	Associate Clinical Professor
Marcinko, Mary M. MD	Assistant Clinical Professor
Marcus, Walter M. MD	Clinical Professor
Mehta, Pranav R. MD	Associate Clinical Professor
Meyering, Steven D. MD	Associate Clinical Professor
Mielke, Kevin J. DO	Associate Clinical Professor
Mikhail, Mina M. MD	Associate Clinical Professor
Mishra, Vinod MD	Assistant Clinical Professor
Mittal, Renu MD	Associate Clinical Professor
Mullen, James H. MD	Associate Clinical Professor
Neuman, Janis F. MD	Assistant Clinical Professor
Nielsen, Virgil J. MD	Associate Clinical Professor
Pagel, Kirk D. MD	Associate Clinical Professor
Pai, Charles DO	Assistant Clinical Professor
Pham, Lien Tran MD	Assistant Clinical Professor
Quan, Melvin A. MD	Assistant Clinical Professor
Rai, Baldev S. MD	Associate Clinical Professor
Richards, Elizabeth M. MD	Associate Clinical Professor
Rogers, Ancel J. MD	Associate Clinical Professor
Saito, Michael T. MD	Assistant Clinical Professor
Sallis, Robert E. MD	Associate Clinical Professor
Scott, Graham MD	Associate Clinical Professor
Shankel, Stewart W. MD	Clinical Professor
Sharpe, Lawrence D. MD	Assistant Clinical Professor
Sheldon, Richard L. MD	Clinical Professor
Silver, Barbara A. MD	Clinical Professor
Simons, Jeffrey R. MD	Associate Clinical Professor
Sinkhorn, C. Paul MD	Associate Clinical Professor
Steel, Catherine M. Ph.D.	Associate Clinical Professor
Stoessel, Paula W. Ph.D.	Clinical Professor
Summerour, Robert B. MD	Associate Clinical Professor
Thiruvengadam, Ravi MD	Associate Clinical Professor
VanHolten, Susan MD	Associate Clinical Professor
Wilson, Steven MD	Assistant Clinical Professor
Wiltchik, Samuel G. MD	Assistant Clinical Professor
Witkowski, Joanne MD	Associate Clinical Professor

CLINICAL FACULTY BRIEF BIOS

Adolfo Aguilera, MD – received an MD degree in 1997 from the University of Illinois-Chicago College of Medicine, performed his residency in Family Practice at Riverside County Regional Medical Center, and is Board Certified in Family Practice. Dr. Aguilera is currently the Attending Faculty Physician for the Family Practice Residency Program at Riverside County Regional Medical Center; and Adjunct Professor, Preceptor and Lecturer to PA students for the Physician Assistant Program at Riverside Community College. He currently serves as a Preceptor at the Assistant Clinical Professor level at UCR.

Y. Paul Aoyagi, MD – received an MD degree in 1973 from Loma Linda University, performed his residency in Family Practice at Kettering Memorial Hospital, and is Board Certified in Family Practice. Dr. Aoyagi is currently the Medical Director for the Student Health Center at La Sierra University, and an Assistant Professor (Family Practice) at Loma Linda University Medical School. He currently serves as a Preceptor and Tutor at the Associate Clinical Professor level at UCR.

Roscoe D. Atkinson, MD – received an MD degree in 1989 from the University of Southern California, performed his residency in Anatomic Pathology & Neuropathology at the University of Southern California and Los Angeles County Medical Center, and is Board Certified in Neuropathology and Anatomic Pathology. Dr. Atkinson is currently an Attending Staff member at Los Angeles County Hospital and USC University Hospital; an Assistant Professor of Clinical Pathology and Neurology at Keck School of Medicine, USC; and Director of Pathology and Laboratory Services at Clarient, Inc. He currently serves as a Lecturer for 1st and 2nd year medical students at the Clinical Professor level at UCR.

A. Raja Bhupathy, DO – received a D.O. degree in 1990 from the University of Health Sciences, College of Osteopathic Medicine, Kansas City, performed his residency in Dermatology at the Western University of Health Sciences in Pomona, CA, completed a one-year fellowship in dermatologic surgery at UCLA, and is Board Certified in Dermatology. Dr. Bhupathy is currently physician at the Brockton Dermatology Group Practice in Riverside, CA. He currently serves as a Lecturer for 2nd year medical students at the Assistant Clinical Professor level at UCR.

Patricia Blakely, MD – received an MD degree in 1988 from the University of Southern California, Los Angeles, CA, performed her residency in Nephrology at the University of California, San Diego, and is Board Certified in Internal Medicine with a subspecialty of Nephrology. Dr. Blakely is currently the Medical Director-Dialysis Management at Renal Advantage, Inc., in Redlands, and an Assistant Professor of Medicine at Loma Linda University Jerry L. Pettis Memorial VA Medical Center. She currently serves as a Facilitator, Pathophysiology of Disease (Problem-Based Learning) at the Assistant Clinical Professor level at UCR.

Ann F. Bolger, MD – received an MD degree in 1981 from the University of California, Los Angeles, CA (via the UCR/UCLA Biomed Program), performed her residency in Internal Medicine at Cedars Sinai Medical Center, and is Board Certified in Internal Medicine with a subspecialty in Cardiovascular Diseases. Dr. Bolger is currently a Professor of Clinical Medicine, Division of Cardiology at the

University of California School of Medicine, San Francisco; Director of Echocardiography at San Francisco General Hospital; and a Co-Investigator, Cardiovascular Flow Dynamics Research Group, Linköping University, Linköping, Sweden. She currently serves as a Lecturer at the Clinical Professor level at UCR.

Neal S. Bricker, MD – received an MD degree in 1949 from the University of Colorado, performed his residency in Internal Medicine at the Peter Brent Brigham Hospital, Harvard Medical School, and is Board Certified in Internal Medicine with a specialty in Nephrology. Dr. Bricker is a Professor Emeritus from the University of California, Los Angeles; Professor of Medicine, Doctorus Honorus at the University of Portugal, Porto; and Senior vice President for Research for NaTRURON Pharmaceutical Corporation, New Canaan, CT. He currently serves as a PBL Clinical Thread Coordinator, Lecturer, and Facilitator at the Clinical Professor level at UCR.

H. Mark Carter, MD – received an MD degree in 1969 from Indiana University, performed his residency in Adult Psychiatry and Adolescent/Child Psychiatry at LAC-USC Medical School, Los Angeles, and is Board Certified in Psychiatry and Neurology. Dr. Carter is a Child Psychiatrist for the Riverside Psychiatric Medical Group and his file is being prepared to serve as a Lecturer at the Assistant Clinical Professor level at UCR.

Suvesh Chandiok, MD – received an MD degree in 1974 from the All India Institute of Medical Sciences, performed his residency in Medicine at the University Hospital, New Jersey Medical School, a Fellowship in Endocrinology at the UCLA School of Medicine, received an MBA, Physician Executive Leadership Program in 1996 from the University of California, Irvine, and is Board Certified in Internal Medicine and Endocrinology & Metabolism. Dr. Chandiok is the Medical Director for Quality Management at Riverside Medical Clinic; an Endocrinology, Diabetes & Metabolism Physician at Riverside Medical Clinic; and Director of the Diabetes Clinic at Arrowhead Regional Medical Center. He currently serves as a Lecturer for the Gastrointestinal, Endocrine and Reproductive Health II course at the Associate Clinical Professor level at UCR.

Adam Chen, MD – received an MD degree in 1983 from State University of New York, performed his residency in Internal Medicine at Nassau County Medical Center, a Fellowship in Gastroenterology at Nassau County Medical Center, and is Board Certified in Internal Medicine and Gastroenterology. Dr. Chen is a Partner Physician in the GI Department at Southern California Permanente Medical Group. He currently serves as a Preceptor at the Assistant Clinical Professor level at UCR.

Walter F. Combs, MD – received an MD degree in 1986 from the University of California, San Francisco, performed his residency and internship in Family Practice at the Ventura County Medical Center/UCLA Affiliated, and is Board Certified in Family Practice. Dr. Combs is a Family Practice Physician and Medical Director at Rancho Family Medical Group. He currently serves as a Preceptor at the Assistant Clinical Professor level at UCR.

Alan C. Compton, MD – received an MD degree in 1991 from the University of California, Los Angeles (via the UCR/UCLA Biomed Program), performed his residency and internship in Family Medicine at the San Bernardino County Medical Center, and is Board Certified in Family Practice. Dr. Compton is the Chairman of the Family Practice Department at Corona Regional Medical Center; Director of the Corona Regional Hospice & Home Health; Aeromedical Examiner for the FAA; Private Practice, Corona, CA; and an Active Staff member at Corona Regional Medical Center. He currently serves as a Preceptor at the Associate Clinical Professor level at UCR.

Lawrence A. Cone, MD – received an MD degree in 1953 from the University of Berne, performed his residency and internship in Medicine at the Dallas Methodist Hospital, performed a residency in medicine and a fellowship in infectious disease at the New York University School of Medicine, and is Board Certified in Internal Medicine, Infectious Diseases, Allergy and Immunology, Medical Oncology and Medical Examiners. Dr. Cone is a Senior Attending Staff member and an Active Staff member at Eisenhower Medical Center, Rancho Mirage, CA; a consulting Staff member at UCLA School of Medicine; Clinical Professor of Medicine at UCLA School of Medicine; Consultant for Infectious Diseases for the Department of Corrections, Chuckwalla Valley State Prison, Blythe; Consultant for Infectious Diseases at the Infectious Diseases, Heart Hospital and Heart Institute of the Desert, Rancho Mirage; Consultant in Smallpox for the State of California, Riverside County; and Awarded HIV/AIDS Specialist for the State Health Department of California. He currently serves as a Lecturer at the Clinical Professor level at UCR.

Andrew P. Corr, MD – received an MD degree from Washington University School of Medicine, a BS and MS in Electrical Engineering from Stanford University, performed his Internship in Internal Medicine at Oregon Health Sciences University, performed his Residency in Internal Medicine and a Fellowship in Geriatric Medicine at the Mayo Clinic Graduate School of Medicine, and is Board Certified in Internal Medicine with a subspecialty of Geriatric Medicine. Dr. Corr is an Internist with a subspecialty in Geriatrics at the Riverside Medical Clinic. He currently serves as a Preceptor at the Assistant Clinical Professor level at UCR.

Vinod K. Dasika, MD – received an MD degree from the Rutgers Medical School, performed his Residency in Family Medicine at the University of Medicine and Dentistry of New Jersey, was the Assistant Chief Resident in Family Medicine at the University of Medicine and Dentistry of New Jersey, and is Board Certified in Family Medicine. Dr. Dasika is the Attending Physician for Family Medicine Residency at Kaiser Foundation Hospital, Fontana Medical Center, and a Family Practice Physician at Kaiser Permanente Medical Group in Colton. He currently serves as a Preceptor at the Associate Clinical Professor level at UCR.

Samuel E. Dey, Jr., MD – received an MD degree in 1983 from Loma Linda University School of Medicine, performed his Residency in Psychiatry at Loma Linda University Medical Center, received an MBA in 1998 from the University of Redlands, and is Board Certified in Psychiatry and Neurology, Diplomate in Psychiatry with added qualifications in Geriatric Psychiatry. Dr. Dey has a private practice in Psychiatry; is the Medical Director for Dogon Psychiatric Services; Consulting Psychiatrist for the Whiteside Manor Substance Abuse Recovery

Services in Riverside; Medical Director of Geriatric Psychiatry Services and Attending Psychiatrist at Community Hospital of San Bernardino; Consultant in Psychiatry and Instructor in Psychiatry for the Family Practice Residency Program, Riverside County Regional Medical Center in Moreno Valley; Consulting Psychiatrist for Vista Pacifica Treatment Facility in Riverside; and Medical Director for Vista Pacifica Treatment Facility in Riverside. He currently serves as a Tutor for Doctoring I course at the Associate Clinical Professor level at UCR.

Tien N. Dinh, MD – received an MD degree in 1999 from the University of California, Los Angeles (via the UCR/UCLA Thomas Haider Program in Biomedical Sciences), performed his Residency and Internship in Pediatrics at Mattel Children's Hospital, Los Angeles, and is Board Certified in Pediatrics. Dr. Dinh is a Per Diem Physician at Kaiser Permanente, Riverside, and Chair, Department of Pediatrics at Riverside County Regional Medical Center, Moreno Valley. He currently serves as a Lecturer at the Assistant Clinical Professor level at UCR.

James T. Evans, MD – received an MD degree in1989 from the University of California San Diego, performed his Residency in Family Practice at the San Bernardino County Medical Center, was Chief Resident in Family Practice at the San Bernardino County Medical Center, and is Board Certified in Family Medicine. Dr. Evans is Staff Physician in the Emergency Room of Mountains Community Hospital, Lake Arrowhead; is the Director of Quality Assessment and Improvement, Department of Family Medicine, Arrowhead Regional Medical Center, Colton; Attending Physician, Department of Emergency Medicine, Arrowhead Regional Medical Center, Colton; Attending Faculty, Department of Family Medicine, Arrowhead Regional Medical Center, Colton; and Associate Program Director, Department of Family Medicine, Arrowhead Regional Medical Center, Colton. He currently serves as a Preceptor at the Associate Clinical Professor Level at UCR.

Donald G. Gates, DO – received a DO degree in 1985 from the University of Osteopathic Medicine and Health Sciences in Des Moines, Iowa, performed his Internship in Family Medicine at the Oklahoma Osteopathic Hospital Satellite Program, his Residency in Family Medicine at the San Bernardino County Medical Center, and is Board Certified in the American Academy of Family Physicians. Dr. Gates is a part time family physician at the Dean Bateman Medical Clinic in Corona and is a Partner Physician for Kaiser Permanente, Corona Medical Offices. He currently serves as a Preceptor at the Associate Clinical Professor level at UCR.

Jonathan R. Greer, MD – received an MD degree in 1987 from the University of Nevada School of Medicine, performed a Residency in Internal Medicine-Pediatrics at Loma Linda University Medical Center, was Chief Resident in General Preventive Medicine at Loma Linda University Medical Center, a Residency in Family Practice at San Bernardino County Medical Center, received a MPH degree in 1992 in Environmental Health & Epidemiology from Loma Linda University School of Public Heath and is Board Certified in Family Practice and Preventive Medicine. Dr. Greer is the Medical Director at Laurel Convalescent Center, Fontana and a Personal Visiting Physician at Care Level Management, Rancho Cucamonga. He currently serves as a Preceptor at the Assistant Clinical Professor level at UCR.

Thomas Haider, MD – received an MD degree in 1984 from Loyola University Stritch School of Medicine, performed an Internship in General Surgery at the University of Colorado, a Residency in Orthopaedics at the University of Colorado, a Spine Fellowship at the University of Colorado, Health Science Center, and a Diplomate, American Board of Spine Surgery. Dr. Haider is President of the Children's Spine Foundation, Riverside; and Medical Director of the Division of Spine Surgery, Riverside County Regional Medical Center. He has served as a Lecturer and currently serves as a member of the Medical School Admissions Committee and is Chairman of the Biomedical Sciences Advisory Board at the Associate Clinical Professor level at UCR.

Laura A. Hammond, Ph.D. – received a Ph.D. degree in 1987 in Counseling Psychology from the University of Florida, performed an Internship in Counseling Psychology at Texas A & M University, a Practicum in Counseling Psychology at Alachua County Crisis Center, a Practicum in Counseling Psychology at Psychological and Vocational Counseling Center at the University of Florida, a Practicum in Counseling Psychology at the Family Practice Medical Group, Gainesville, FL, and is a California Licensed Psychologist. Dr. Hammond is the Assistant Director at the Counseling Center, University of California, Riverside, and an Associate Adjunct Professor in the Department of Psychology, University of California Riverside. She currently serves as a Tutor in the Doctoring I course at the Associate Clinical Professor level at UCR.

Leita Harris, MD – received an MD degree in 1986 from Cornell University Medical College, NY, performed her Residency and Internship in Obstetrics and Gynecology at USC Medical Center, Los Angeles, and is Board Certified in Obstetrics and Gynecology. Dr. Harris is an Obstetrics/ Gynecology Physician at Riverside Medical Clinic. She currently serves as a Lecturer, Tutor, and Facilitator at the Assistant Clinical Professor level at UCR.

Fred Z. Havens, MD – received an MD degree in 1945 from the University of Minnesota School of Medicine; performed his Residency in Internal Medicine at the Mayo Clinic, Rochester; his Internship in Internal Medicine at St. Luke's Hospital College of Medicine, Chicago; and is Board Certified in Internal Medicine. Dr. Havens is a Consulting Physician for the Department of Internal Medicine, Riverside Medical Clinic. He currently serves as a Facilitator at the Assistant Clinical Professor level at UCR.

Hai Ho, MD – received an MD degree in 1992 from the University of Southern California, Los Angeles; performed a Surgical Internship at Los Angeles County/University of Southern California Medical Center; his Residency in Family Practice at Riverside General Hospital; and is Board Certified in Family Practice. Dr. Ho is an Attending Physician in the Department of Family Practice, Riverside County Regional Medical Center, Moreno Valley; and an Adjunct Faculty member at Riverside Community College. He currently serves as a Tutor at the Assistant Clinical Professor level at UCR.

Thanh Vincent Duy Hoang, MD – received an MD degree in 1996 from the University of Southern California, Los Angeles, and performed his Residency in Internal Medicine at Loma Linda University. Dr Ho is an Attending Physician in the

Department of Internal Medicine, Kaiser Permanente Foundation Hospital in Riverside and is currently serving as a Preceptor at the Assistant Clinical Professor level at UCR.

Jonathan W. Horstmann, MD – received an MD degree in 1977 from Washington University School of Medicine, St. Louis; performed a Rotating Internship at Mercy Hospital Medical Center, San Diego; his Residency in Emergency Medicine at University of Chicago; a Residency in Anesthesiology at Mercy Hospital Medical Center, San Diego; a Residency in Family Practice at the State University of New York, Stony Brook; and is Board Certified in Family Practice and Undersea and Hyperbaric Medicine. Dr. Horstmann is a Physician in Family Practice at the Beaver Medical Group, Redlands; on Active Staff at Redlands Community Hospital; and a Clinical Instructor in Family Medicine at Loma Linda School of Medicine. He currently serves as a Clinical Thread Coordinator for Year 1 Instruction and as a PBL Facilitator and Lecturer at the Associate Clinical Professor level at UCR.

Frank D. Howard, MD – received an MD degree in 1985 from Harvard Medical School, performed an Internship in Medicine at Brigham and Women's Hospital, Boston; Junior Assistant Resident, Internal Medicine, Brigham and Women's Hospital, Boston; Clinical Fellow, Medicine, Harvard Medical School; Fellow, Medical Oncology, Dana-Farber Cancer Institute, Boston; Clinical Fellow, Medicine, Brigham and Women's Hospital, Boston; Research Fellow, Medicine, Laboratory of Immunobiology, Dana-Farber Boston, Cancer Institute; Clinical Fellow, Medicine, John Hopkins School of Medicine, Baltimore; and is Board Certified in Internal Medicine with a subspecialty in Medical Oncology. Dr. Howard is Chief of Medical Oncology at Arrowhead Regional Medical Center, Colton. He currently serves as a Lecturer at the Associate Clinical Professor Level at UCR.

Galen C. L. Huang, MD – received an MD degree in 1975 from the University of Miami, performed an Internship and Residency in Internal Medicine at Los Angeles County/University of Southern California Medical Center; a Fellowship in Gastroenterology at the University of California, Davis Medical Center; and is Board Certified in Internal Medicine with a subspecialty in Gastroenterology. Dr. Huang is a Physician at the Clinical Practice of Internal Medicine and Gastroenterology, Riverside; and an Assistant Clinical Professor at Loma Linda University. He currently serves as a Lecturer at the Associate Clinical Professor level at UCR.

Andrew M. Hubbard, MD – received an MD degree in 1981 at the University of California, Irvine; performed his Residency in Family Practice at Kaiser Foundation Hospital, Fontana, and is Board Certified in Family Practice. Dr. Hubbard is a Partner with the Southern California Permanente Medical Group, Fontana. He currently serves as a Preceptor at the Associate Clinical Professor level at UCR.

William P. Hunt, MD – received an MD degree in 1977 from the University of Southern California, School of Medicine, Los Angeles; performed his Residency in Family Practice at the University of California/Natividad Medical Center, San Francisco; was Chief Resident in Family Practice at the University of California/Natividad Medical Center, San Francisco; and is Board Certified in Family Practice. Dr. Hunt is Partner Physician at Kaiser Foundation Hospital, Riverside Medical Clinic and a Clinical Instructor at the University of Southern, California

School of Medicine, Los Angeles. He currently serves as Course Coordinator and Lecturer for Doctoring II and is a member of the Medical Student Promotion Committee at the Associate Clinical Professor level at UCR.

Dean N. Huynh, MD – received an MD degree in 1994 at the University of Southern California, School of Medicine; performed his Internship at the University of California Veteran's Administration, Irvine and Long Beach Memorial Hospital, Long Beach; a Residency in Internal Medicine at the University of California Veteran's Administration, Irvine and Long Beach Memorial Hospital, Long Beach; and is Board Certified in Internal Medicine and Advanced Cardiac Life Support. Dr. Huynh is a Staff Physician in the Department of Internal Medicine, Kaiser Permanente Medical Group, Fontana. He currently serves as a Preceptor at the Assistant Clinical Professor level at UCR.

James S. Hwang, DO – received a DO degree in 1993 from the College of Osteopathic Medicine of the Pacific, Pomona; performed his Residency in Family Practice at San Bernardino County Medical Center; and is a Diplomate of the American Board of Family Practice. Dr. Hwang is a Staff Physician in the Family Practice Department of Kaiser Permanente Medical Center, Riverside. He currently serves as a Preceptor at the Associate Clinical Professor level at UCR.

Emad Ibrahim, MD – received an MD degree in 1987 from Alexandria Faculty of Medicine, Alexandria University, Egypt; performed a rotating Internship at Alexandria University Hospital, Egypt; did Basic Science Research at the USC Neuromuscular Center, Los Angeles; a residency in Internal Medicine at USC -1 AC Medical Center, Los Angeles; a Fellowship in Hematology and Oncology at the University of Washington, Fred Hutchinson Cancer Research Center; and is Board Certified in Internal Medicine and Medical Oncology. Dr. Ibrahim is Chair of the Department of Oncology at the Beaver Medical Group, Highland, CA. His appointment file is in progress.

Asma B. Jafri, MD – received an MD degree in 1977 at Fatimah Jinnah Medical College, Pakistan; performed her Residency in Family Practice at San Joaquin General Hospital, Stockton; and is Board Certified in Family Practice with Certificate of Added Qualifications in Geriatrics. Dr. Jafri is the Director of the Department of Family Practice Residency Program, Riverside County Regional Medical Center, Moreno Valley. She currently serves as a Course Coordinator and Tutor for Doctoring I courses at the Clinical Professor level at UCR.

William E. Junkert, Jr., MD – received an MD degree in 1955 from the University of California School of Medicine, San Francisco; performed a Rotating Internship in General Medicine at the San Francisco Hospital; performed a Residency in Internal Medicine at Riverside General Hospital and is a Diplomate, American Board of Family Practice. Dr. Junkert is a retired physician. He currently serves as Facilitator and Lecturer at the Clinical Professor level at UCR.

Ramesh Karody, MD – received an MD degree in 1974 from the Institute of Medical Sciences, Osmania Medical College, India; performed a Residency in Internal Medicine at the Catholic Medical Center of Brooklyn and Queens, NY; was Chief Resident of Internal Medicine at the Catholic Medical Center of Brooklyn and

Queens, NY; a Fellowship in Critical Care Medicine at the University of Pittsburgh School of Medicine and is Board Certified in Internal Medicine. Dr. Karody is a Physician in Internal Medicine/Critical Care, Parkview Community Hospital, Riverside; and a Physician in Internal Medicine/Critical Care, Riverside Community Hospital. He currently serves as a Lecturer at the Associate Clinical Professor level at UCR.

Daniel Kim, MD – received an MD degree in 1994 from the Hahnemann University school of Medicine, Philadelphia; performed an Internship/Residency in Internal Medicine at Loma Linda University Medical Center; was Chief Resident in Internal Medicine at Loma Linda University Medical Center; and is Board Certified in Internal Medicine. Dr. Kim is Chief of the Division of Ambulatory Medicine, Riverside, County Regional Medical Center, Moreno Valley. He currently serves as the Preceptoring Coordinator for Doctoring I and II courses at the Associate Clinical Professor level at UCR.

Rajagopal Krishnan, MD – received an MD degree in 1978 from the Royal College of Physicians, Edinburgh; performed a Residency in Internal Medicine at Loma Linda University Medical Center; was Chief Medical Resident in Internal Medicine at Riverside General Hospital-University Medical Center; a Fellowship in Cardiovascular Nuclear Medicine at UC San Francisco; a Fellowship in Cardiovascular Medicine at Loma Linda University Medical Center; and is Board Certified in Cardiovascular Diseases. Dr. Krishnan is an Assistant Professor of Medicine at Loma Linda University School of Medicine; and Attending Physician and Chief of Cardiology at Riverside County Regional Medical Center. He currently serves as a Lecturer at the Clinical Professor level at UCR.

David A. Lanum, MD – received an MD degree in 1995 from the University of Washington, Seattle; performed a Residency in Family Practice at the San Bernardino County Medical Center; was Chief Resident in Family Practice at San Bernardino County Medical Center; and is Board Certified in Family Practice. Dr. Lanum is a Physician in the Clinical Teaching Attending in Family Practice Residency Program at the Family Medicine Faculty Medical Group, Arrowhead Regional Medical Center, Colton. He currently serves as a Preceptor at the Assistant Clinical Professor level at UCR.

Steven E. Larson, MD – received an MD degree in 1975 from the Medical College of Wisconsin, Wauwatosa; performed a Residency in Internal Medicine at the Medical College of Wisconsin, Affiliated Hospitals, Milwaukee; a Fellow in Infectious Diseases at the Medical College of Wisconsin Affiliated Hospitals, Milwaukee; received an MPH in 1988 in Health Administration from Loma Linda University; and is Board Certified in Internal Medicine and Infectious Diseases. Dr. Larson is the Director of the Infectious Disease Clinic at Riverside County Regional Medical Center, Riverside; and Hospital Health Officer and Epidemiologist, Riverside County Regional Medical Center, Riverside. He currently serves as a Preceptor at the Clinical Professor level at UCR, and is Chairman and CEO of Riverside Medical Clinic.

Sharon M. Laughlin, MD – received an MD degree in 1984 from the University of California, Los Angeles (via the UCR/UCLA Biomed Program), performed her Family Practice residency at the San Bernardino County Medical Center, and is Board Certified in Family Practice. She is a private practice Family physician in Riverside. She currently serves as a Preceptor for 1st and 2nd year medical students at the Associate Clinical Professor level at UCR.

Lawrence K. Loo, MD – received an MD degree in 1981 from the University of California, San Diego, performed his Family Medicine internship and residency at Loma Linda University Medical Center, his postdoctoral fellowship in Primary Care and Faculty Development at Michigan State University, and is a diplomate of the National Board of Medical Examiners and the American Board of Internal Medicine. He currently serves as Vice-Chair of the Department of Medicine at Riverside County Regional Medical Center (RCMRC); Course Director for Evidence-Based Medicine and Information Sciences at Loma Linda University School of Medicine; Governor of the Southern California Region of the American College of Physicians; and Immediate Past Chief of Medical Staff at RCRMC. He currently serves as Associate Director of Clinical Instruction, as a Course Coordinator, and Lecturer, and as a member of the Medical Admissions Committee; he is a Clinical Professor at UCR.

Javier L. Machuca, MD – received an MD degree in 1986 from the University of California, Irvine, performed his Family Practice residency at USC/California Medical Center, and is a diplomate of the American Academy of Family Practice. He is currently a staff physician at Kaiser Foundation Hospital, Riverside Medical Center. He currently serves as a Preceptor at the Associate Clinical Professor level at UCR.

Mary M. Marcinko, MD – received an MD degree in 1988 from the University of the Witwatersrand School of Medicine (Johannesburg, South Africa), performed her Family Practice residency at Kaiser Permanente Riverside Family Practice Program, and is Board Certified by the American Academy of Family Practice. She is currently a per diem physician at Kaiser Permanente Riverside Medical Center and Associate Professor of Kinesiology at California Baptist University. She currently serves as Tutor, Facilitator, Lecturer, and Clinical Thread Coordinator for the clinical skills component of the 1st and 2nd years of medical school at the Assistant Clinical Professor level at UCR.

Walter M. Marcus, MD – received an MD degree in 1971 from the University of Pittsburgh School of Medicine, performed a rotating internship at Lancaster (PA) General Hospital, and OB/GYN residencies at the Mayo Clinic and Cook County (IL) Hospital, and is Board Certified by the American Board of Obstetrics and Gynecology. He is currently a private practice OB/GYN physician and a Clinical Professor at UC Irvine. He serves as a Lecturer and Preceptor at the Clinical Professor level at UCR.

Pranav R. Mehta, MD – received an MD degree in 1992 from New York Medical College, performed his Family Practice residency at San Bernardino County Medical Center, and is a diplomate of the National Board of Medical Examiners. He is currently a private practice Family Medicine physician in Yucaipa; an affiliated physician with PrimeCare Medical Group (Redlands); and a faculty member at

Arrowhead Regional Medical Center. He serves as a Preceptor for 1st and 2nd year medical students at the Associate Clinical Professor level at UCR.

Steven D. Meyering, MD – received an MD degree in 1984 from the University of Southern California School of Medicine, performed his Internal Medicine internship and residency at Loma Linda University Medical Center, and is Board Certified by the American Board of Internal Medicine. He is currently a private practice physician specializing in General Internal Medicine. He serves as a Preceptor for 1st year medical students at the Associate Clinical Professor level at UCR.

Kevin J. Mielke, D.O. – received a D.O. degree in 1984 from the College of Osteopathic Medicine of the Pacific (Pomona), performed a rotating Osteopathic internship at the Michigan Osteopathic Medical Center, and a Family Practice residency at Riverside General Hospital, and is Board Certified by the American Academy of Family Physicians. He is currently the Physician in Charge of the Wildomar Valley Medical Offices of Kaiser Permanente. He serves as facilitator and lecturer in clinical skills for the 1st and 2nd year medical students at the Associate Clinical Professor level at UCR.

Mina M. Mikhail, MD – received an MD degree in 1978 from Alexandria University (Egypt) School of Medicine, performed an Internal Medicine internship at Alexandria University Medical Center, an Emergency Medicine residency at an Egyptian military hospital, and an Anesthesia residency at Alexandria University Hospitals, and is Board Certified in Internal Medicine. He is currently a private practice Internal Medicine physician in Riverside. He currently serves as a Preceptor for 1st and 2nd year medical student at the Associate Clinical Professor level at UCR.

Vinod Mishra, MD – received an MD degree in 1974 from Saiwai Man Singh Medical College, University of Rajasthan (India), performed a Psychiatry residency at the University of Western Ontario, a Medicine internship and residency at Illinois Masonic Hospital, a Gastroenterology residency at Michael Reese Hospital (Chicago, IL), and is Board Certified by the American Board of Internal Medicine. He is currently Chief of Gastroenterology at Riverside Community Hospital and a private practice physician specializing in Gastrointestinal Diagnosis and Management. He currently serves as a Gastroenterology Lecturer for 1st and 2nd year medical students at the Assistant Clinical Professor level at UCR.

Renu Mittal, MD – received a MBBS degree in 1982 from the University of London, performed an internship in Medicine at Hillingdon Hospital (England), a Surgery internship at Rugby Hospital (England), an Anesthesiology residency at Walton Hospital (Liverpool, England), a Family Practice residency at Lutheran Medical Center (Brooklyn), and is Board Certified by the American Board of Family Practice and the American Geriatric Society. She is a Family Medicine Staff Member at Kaiser Permanente, Fontana. Dr. Mittal currently serves as a Preceptor for 1st and 2nd year medical students at the Associate Clinical Professor level at UCR.

James H. Mullen, MD – received an MD degree in 1960 from Creighton University School of Medicine, performed a Surgical residency at Santa Clara Valley Medical Center (San Jose), and is Board Certified in General Surgery. He is a retired private

practice physician. He serves as a Tutor, Lecturer, and Facilitator for 1st and 2nd year medical students at the Associate Clinical Professor level at UCR.

Janis F. Neuman, MD – received an MD degree in 1976 from the University of Southern California School of Medicine, performed a Family Medicine residency at Kaiser Foundation Hospital (Fontana), and is a Diplomate of the American Board of Family Practice. She is the Medical Director of the Riverside County Family Care Centers. Dr. Neuman currently serves as an active member of the Medical Admissions Committee at the Assistant Clinical Professor level at UCR.

Virgil J. Nielsen, MD -- received an MD degree in 1980 from Loma Linda University, performed a Family Practice residency (LLU) at Riverside General Hospital and an Internal Medicine residency at UCLA Kern Medical Center, and is Board Certified in Internal Medicine and Geriatrics. He is currently a physician with Kaiser Foundation Hospital, Riverside. He currently serves as a Preceptor at the Associate Clinical Professor level at UCR.

Kirk D. Pagel, MD – received an MD degree in 1979 from Loma Linda University, performed a residency in Psychiatry at Loma Linda University Medical Center and another in Family Medicine at Kaiser Foundation Hospital (Fontana, CA), and is a Diplomate of the American Board of Family Practice. He is currently a family physician with Kaiser Permanente Medical Group (Palm Springs, CA), and a Captain in the Medical Corps of the U. S. Naval Reserves. He currently serves as a Preceptor at the Associate Clinical Professor level at UCR.

Charles Pai, D.O. – received a D.O. degree in 1994 from the College of Osteopathic Medicine of the Pacific (Pomona, CA), performed his Family Medicine residency at the San Bernardino County Medical Center, and is Board Certified by the American Board of Family Medicine. He is currently a physician with Kaiser Permanente Medical Group in Riverside. He serves as a Preceptor at the Assistant Clinical Professor level at UCR.

Lien Tran Pham, MD – received an MD in 1978 from the University of Saigon (Vietnam), performed his Family Practice residency at San Bernardino County Medical Center, and is Board Certified by the American Board of Family Practice. He is currently Attending Physician in the Family Practice Residency Program at Arrowhead Regional Medical Center (ARMC); Emergency Physician with the California Emergency Physicians Medical Group at ARMC; Director of the Dermatology Clinic at ARMC; Asst. Clinical Professor in the Dept. of Family Medicine at Loma Linda University; Certified Physician Acupuncturist with the Dept. of Family Medicine at ARMC; and Chair, Complementary Alternative Medicine Planning Group at ARMC. He serves as a Preceptor at the Assistant Clinical Professor level at UCR.

Melvin A. Quan, MD – received an MD in 1981 from the Universidad Autonoma de Guadalajara, performed his Family Practice internship and residency at Riverside General Hospital, and is Board Certified by the American Board of Family Practice. He is currently a Staff Physician and Assistant Director of the Family Practice Residency Program at Riverside County Regional Medical Center (RCRMC). He

serves as a Preceptor for 2nd year medical students at the Assistant Clinical Professor level at UCR.

Baldev S. Rai, MD – received an MD in 1979 from the Government Medical College (G.N.D. University – Amritsar, India), performed his Neurology residencies at St. Louis University School of Medicine and New York Medical College, a Fellowship in Neuromuscular Diseases at USC Neuromuscular Center, and is a Diplomate of the American Board of Neurology, the American Board of Electrodiagnostic Medicine and the American Board of Sleep Medicine. He is currently a physician in private practice in Neurology, Neuromuscular Diseases and Sleep Disorders. He serves as a Lecturer for 1st and 2nd year medical students in Neurology at the Associate Clinical Professor level at UCR.

Elizabeth M. Richards, MD – received an MD in 1977 from the UCLA School of Medicine, performed her Family Medicine internship and residency at San Bernardino County Medical Center, and is Board Certified by the American Board of Family Practice. She is currently a Faculty Physician with the Family Practice Residency Program at Arrowhead Regional Medical Center (ARMC); Assistant Clinical Professor with the UC Irvine School of Medicine Family Practice Residency Program at ARMC; and Assistant Clinical Professor with the College of Osteopathic Medicine of the Pacific. She serves as a Preceptor at the Associate Clinical Professor level at UCR.

Ancel J. Rogers, MD – received an MD in 1979 from Harvard Medical School, performed residencies in General Surgery at Cedars-Sinai Medical Center and the University of Texas Medical School, a residency in Cardiothoracic Surgery at the University of Pittsburgh Medical School, and is Board Certified in Surgery and Thoracic Surgery. He is currently a Surgeon and Physician in Riverside, and an Associate Professor of Surgery at Western University of Health Sciences. He currently serves as a member of the Medical Admissions Committee, a member of the Dean's Medical Mission Committee, and is very active in outside activities for the medical students. He serves at the Associate Clinical Professor level at UCR.

Michael T. Saito, MD – received an MD in 1986 from the University of Southern California School of Medicine, performed his residency in Pediatrics at USC/LA County Dept. of Pediatrics, and a Fellowship in Pediatric Neurology. He is currently a physician at Riverside Medical Clinic, and is Head of the Pediatric Head Trauma Team at Riverside Community Hospital. He currently serves a Lecturer for 1st and 2nd year medical students at the Assistant Clinical Professor level at UCR.

Robert E. Sallis, MD – received an MD in 1987 from Texas A&M University College of Medicine, performed his residency in Family Medicine at Kaiser Permanente Medical Center (Fontana, CA), and is a Diplomate of the American Board of Family Practice. He is currently a staff physician and co-director of the Sports Medicine Clinic at Kaiser Permanente Medical Center in Fontana; a Clinical Instructor of Family Medicine at the UC San Diego School of Medicine; a Clinical Preceptor for the Keck School of Medicine at USC; and Team Physician for Pomona College in Claremont, CA. He currently serves as a Lecturer and Tutor for Clinical Skills and Introduction to Patient Examination, and he also serves on the Medical Admissions

Committee and the Student Externships and Clinical Research Committee at the Associate Clinical Professor level at UCR.

Graham Scott, MD – received his MD in 1985 from the University of Cape Town (South Africa) Medical School, performed his internship in General Medicine at Coronation Hospital (Johannesburg), his residency in General Surgery and Otolaryngology at Groote Schuur Hospital (Cape Town) as well as a residency in Family Medicine at Kaiser Permanente, Riverside), and is Board Certified in Family Medicine. Dr. Scott is a Staff Physician in the Department of Family Medicine at Kaiser (Riverside) Medical Center. He currently serves as a Preceptor for 1st and 2nd year medical students at the Associate Clinical Professor level at UCR.

Stewart W. Shankel, MD – received his MD in 1958 from Loma Linda University, performed his internship at Portland Adventist Hospital, a residency at Los Angeles County General Hospital, a Fellowship in Cardiology at White Memorial Medical Center, and a Fellowship in Nephrology at Washington University School of Medicine, and is Board Certified in Internal Medicine and Nephrology. He is retired from private practice. He serves as Director of Clinical Instruction at the Clinical Professor level at UCR, is on the Medical Admissions Committee and the Dean's Medical Mission Committee, and has been very involved in discussions about planning for the proposed medical school.

Lawrence D. Sharpe, MD – received his MD in 1970 from Marquette School of Medicine in Milwaukee, performed his Pediatric internship at Milwaukee Children's Hospital, his residency in Pedriatics at University of Iowa Hospital, and is Board Certified in Pediatrics. He is a physician at Riverside Medical Clinic. His clinical file is currently being prepared for him to serve at the Assistant Clinical Professor level at UCR.

Richard L. Sheldon, MD – received his MD in 1968 from Loma Linda University, performed his residency in Internal Medicine at Walter Reed Army Medical Center, and a fellowship in Pulmonary and Critical Care Medicine at Walter Reed Army Medical Center. He is Medical Director of Respiratory Care at Beaver Medical Center (Banning, CA); Staff Consultant in Pulmonary & Intensive Care Medicine at the J. L. Pettis Veterans Hospital (Loma Linda, CA); and a Clinical Professor of Medicine at Loma Linda University. He currently serves as a lecturer for 1st year medical students at the Clinical Professor level at UCR.

Barbara A. Silver, MD – received her MD in 1985 from UC Irvine, performed her internship and residency in psychiatry at UC Irvine, and is Board Certified in Psychiatry and Neurology. Dr. Silver is a per diem psychiatrist at Kaiser Permanente South Bay (Lomita, CA). She currently serves as a Lecturer for 1st and 2nd year medical students at the Clinical Professor level at UCR.

Jeffrey R. Simons, MD – received his MD in1966 from the University of Vermont, performed his internship and residency in Internal Medicine at the University of Pittsburgh Health Center Hospitals, and is Board Certified in Internal Medicine. Dr. Simons is currently Medical Director of the Respiratory Therapy Department and the Intensive Care Unit at Riverside Community Hospital. He currently serves as a Lecturer and Tutor at the Associate Clinical Professor level at UCR.

C. Paul Sinkhorn, MD – received his MD in 1978 from the University of Illinois and performed his internship and residency in Obstetrics and Gynecology at the University of Arkansas Hospital. Dr. Sinkhorn is currently a physician specializing in OB/GYN in private practice in Redlands and is on the teaching faculty at Arrowhead Regional Medical Center (Colton, CA). He currently serves as a Lecturer for 1st and 2nd year medical students at the Associate Clinical Professor level at UCR.

Catherine M. Steel, Ph.D. – received her Ph.D. in Counseling Psychology in 1976 from the University of Missouri, and is a Licensed Psychologist. Dr. Steel serves as a Tutor in Doctoring I and II courses at the Associate Clinical Professor Level at UCR.

Paula W. Stoessel, Ph.D. – received her Ph.D. in 1990 from University of California, Los Angeles, and is a Licensed Clinical Psychologist. Dr. Stoessel is currently a Professor of Psychology at the David Geffen School of Medicine at UCLA, Director of the Interpersonal Psychotherapy Clinic at UCLA, and Director of Mental Health Services for Physicians in Training at UCLA. She serves as a Lecturer and a counseling liaison for medical students at UCLA. She is at the Clinical Professor level at UCLA and UCR.

Robert B. Summerour, MD – received his MD in 1971 from Loma Linda University School of Medicine, performed his residency in Psychiatry at Loma Linda University Medical Center, and is Board Certified in Psychiatry and Neurology. Dr. Summerour is currently the Medical Director of Focus Health Care, the Medical Director and CEO of Knollwood Psychiatric and Chemical Dependency Center, a private practice psychiatrist with Riverside Psychiatric Medical Group. He currently serves as a Clinical Thread Coordinator and Lecturer at the Associate Clinical Professor level at UCR.

Ravi Thiruvengadam, MD – received a Bachelor of Medicine and Bachelor of Surgery degree in 1979 from Madras Medical College & Government General Hospital in Madras, India, and performed his internship at Our Lady of Mercy Medical Hospital (New York, NY), his residency in Internal Medicine at SUNY, Stony Brook (NY), and a Fellowship in Gastroenterology at the Mayo Clinic and Mayo Graduate School of Medicine. He is Board Certified in Internal Medicine and Gastroenterology. Dr. Thiruvengadam is currently a private practice physician specializing in Gastroenterology and an Asst. Clinical Professor of Medicine at UC Irvine College of Medicine. He currently serves as a Lecturer at the Associate Clinical Professor level at UCR.

Susan VanHolten, MD – received an MD degree in 1979 from the Medical College of Pennsylvania, and performed her internship in Family Practice at Chestnut Hill Hospital (Philadelphia, PA) and her residency in Family Practice at Northridge Hospital, and is Board Certified in Family Practice. Dr. VanHolten is currently a Staff Physician at the Veitch Student Health Service (UCR). She serves as a Co-Coordinator, Lecturer and IPE Facilitator as well as Clinical Thread Coordinator, Lecturer and Tutor for 1st and 2nd year medical students at the Associate Clinical Professor level at UCR.

Steven Wilson, MD – received an MD degree in 1988 from the University of Oklahoma and performed his internship and residency at the San Bernardino County Medical Center. Dr. Wilson is currently the Medical Director of "In Your Best Interest" Medical Clinic in Redlands, CA, and President of the Redlands Yucaipa Medical Group. He currently serves as a PBL facilitator at the Assistant Clinical Professor level at UCR.

Samuel G. Wiltchik, MD – received an MD degree in 1962 from Chicago Medical School, performed his residency in Obstetrics and Gynecology at Philadelphia General Hospital, and is Board Certified in OB/GYN. Dr. Wiltchik is currently the Medical Director (IPA) of the Riverside Physicians Network. He currently serves as a Tutor and Lecturer at the Assistant Clinical Professor level at UCR.

Joanne Witkowski, MD – received an MD degree in 1986 from the Academy of Medicine (Warsaw, Poland), performed her residency in Psychiatry at the Medical College of Pennsylvania, and is Board Certified in Psychiatry. Dr. Witkowski is currently the Chief of Service in Psychiatry at Kaiser Riverside Medical Center. She currently serves as a PBL Instructor at the Associate Clinical Professor level at UCR.

APPENDIX E. POSTGRADUATE TRAINING PROGRAMS

Exhibit 1: GME Office Support Salary

Exhibit 2: Department Specific GME Administrative Support Salary

Exhibit 3: GME Office Non-Salary by Expense Category

Exhibit 4: Department Specific Non-Salary Costs of Individual GME Programs

Appendix E. Exhibit 1: GME Office Support Salary

Title Description	FTE	Annual Salary & Benefits	Other Notes
Designated Institutional Official	1.00	$ 177,750	Based on Assistant Dean's Salary
Financial Administrative Officer	1.00	81,920	
Administrative Staff	1.00	63,104	
Administrative Staff	1.00	63,104	
Total GME Office Salary Support	**4.00**	**$ 385,878**	
Total Targeted Residents		**160**	
Cost Per Resident		**$ 2,412**	**<-------Per Resident Cost**

Appendix E - Exhibit 2: Department Specific GME Administrative Support Salary

Title Description	FTE	Annual Salary & Benefits	Other Notes
Internal Medicine	1.50	$94,656	1.5 FTEs due to program size
Family Practice - Rural	-	$0	
Family Practice - Urban	1.00	$63,104	
Pediatrics	1.00	$63,104	
Psychiatry	1.00	$63,104	
General Surgery	1.00	$63,104	
OB/GYN	1.00	$63,104	
Total GME Office Salary Support	**6.50**	**$410,176**	
Total Targeted Residents		**160**	
Cost Per Resident		**$2,564**	**<-----Per Resident Cost**

Appendix E - Exhibit 3: GME Office Non-Salary by Expense Category

Expense Category	All Residents	Per Resident
Supplies	$ 55,284	$ 121
Dues/Books/Subscriptions	$ 98,840	$ 217
Copying & Printing	$ 26,125	$ 57
Repairs & Maintenance	$ 18,536	$ 41
Other Purchased Services	$ 48,472	$ 106
Travel	$ 83,834	$ 184
Recruitment	$ 17,856	$ 39
Building / Equipment Lease	$ 46,157	$ 101
Utilities	$ 9,855	$ 22
Telephone	$ 20,670	$ 45
Miscellaneous	$ 22,602	$ 50
Regulatory Fees	$ 119,994	$ 263
CME	$ 89,964	$ 197
Malpractice Insurance	$ 66,164	$ 145
Health Insurance Program	$ 45,803	$ 100
Total Non-Salary Costs	**$ 770,156**	**$ 1,690**
Total Resident FTEs	**455.77**	
Non-Salary Cost per Resident FTE	**$ 1,690**	**<-----Per Resident Cost**

Appendix E - Exhibit 4: Department Specific Non-Salary Costs of Individual GME Programs

Description	Family Practice	Internal Medicine	OB/GYN	Psych	Surgery	Totals	Per Resident
Supplies	$9,699	$5,417	$1,456	$1,500	$1,750	$19,822	$166
Dues/Books/Subscriptions	$26,560	$12,730	$7,500	$8,000	$10,000	$64,790	$543
Copying & Printing	$2,271	$2,300	$1,048	$1,500	$2,000	$9,119	$76
Accreditation/RRC Site Visits	$16,000	$5,000	$10,000	$5,000	$5,000	$41,000	$344
Travel - Mileage	$756	$756	$250	$250	$250	$2,262	$19
Travel - Education, Meetings	$34,200	$23,500	$4,500	$2,500	$2,500	$67,200	$564
Food Costs	$2,507	$1,029	$800	$950	$1,050	$6,336	$53
Recruitment	$10,000	$3,000	$1,200	$1,000	$1,000	$16,200	$136
Misc. (graduation dinner & gift)	$4,000	$714	$2,000	$2,000	$2,000	$10,714	$90
Total Non-Salary Costs	**$105,993**	**$54,446**	**$28,754**	**$22,700**	**$25,550**	**$237,443**	**$1,992**
Resident FTEs	**51.80**	**23.50**	**13.17**	**12.00**	**18.75**	**119.22**	
Cost Per Resident	**$2,046**	**$2,317**	**$2,183**	**$1,892**	**$1,363**	**$1,992**	**<-----Per Resident Cost**

APPENDIX F. SUPPORTING FINANCIAL SCHEDULES AND ASSUMPTIONS

Exhibit 1: School of Medicine Projected Operating Budget Plan

Exhibit 2: Functional Summary of Annual Projected Operating Budget Plan for Period 2008-09 through 2021-22

Exhibit 3: Summary of Significant Operating Assumptions for Projected Operating Budget Plan

Appendix F – Exhibit 1: School of Medicine Projected Operating Budget Plan

	Fiscal Year Ending (in thousands)													
	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022
REVENUE FUNDING														
State Funds	$ 2,349	$ 2,451	$ 2,451	$ 2,451	$ 4,460	$ 6,548	$ 12,973	$ 18,735	$ 21,923	$ 24,948	$ 25,108	$ 25,229	$ 25,309	$ 25,350
Student Fees	$ 984	$ 1,054	$ 1,054	$ 1,054	$ 1,437	$ 1,845	$ 3,637	$ 5,445	$ 6,379	$ 7,312	$ 7,375	$ 7,422	$ 7,453	$ 7,469
Grant and Contract Revenue (Direct)	$ 2,696	$ 3,770	$ 6,650	$ 8,220	$ 8,400	$ 10,690	$ 11,440	$ 17,870	$ 19,270	$ 23,920	$ 25,270	$ 26,300	$ 27,170	$ 27,250
ICR Group III Allocation	$ 117	$ 164	$ 290	$ 358	$ 366	$ 466	$ 498	$ 778	$ 839	$ 1,042	$ 1,101	$ 1,145	$ 1,183	$ 1,187
GME Affiliation	$ -	$ -	$ -	$ -	$ 2,145	$ 4,950	$ 8,828	$ 10,560	$ 12,128	$ 13,200	$ 13,200	$ 13,200	$ 13,200	$ 13,200
UCOP / Campus Support for Transition Capital	$ 2,083	$ 1,145	$ 87	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
UC Biomedical Sciences Program Instructional Support	$ 1,004	$ 1,004	$ 1,004	$ 1,004	$ 427	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL REVENUES	**$ 9,234**	**$ 9,589**	**$ 11,536**	**$ 13,087**	**$ 17,235**	**$ 24,499**	**$ 37,376**	**$ 53,389**	**$ 60,538**	**$ 70,422**	**$ 72,054**	**$ 73,296**	**$ 74,316**	**$ 74,455**
OPERATING EXPENSES														
Faculty Salaries, Wages and Benefits	$ 2,151	$ 2,729	$ 3,400	$ 5,148	$ 6,759	$ 8,877	$ 12,370	$ 16,564	$ 18,134	$ 21,352	$ 21,674	$ 21,958	$ 22,094	$ 22,094
Community Based Physician Stipends	$ 631	$ 646	$ 646	$ 646	$ 702	$ 839	$ 2,246	$ 2,615	$ 3,679	$ 3,743	$ 3,579	$ 3,583	$ 3,412	$ 3,385
Staff Salaries, Wages and Benefits	$ 3,520	$ 5,683	$ 7,897	$ 9,884	$ 11,153	$ 12,976	$ 14,272	$ 20,023	$ 21,037	$ 25,128	$ 26,503	$ 27,179	$ 27,448	$ 27,448
Resident Salaries, Wages and Benefits	$ -	$ -	$ -	$ -	$ 1,352	$ 3,289	$ 6,123	$ 7,404	$ 8,678	$ 9,646	$ 9,646	$ 9,646	$ 9,646	$ 9,646
Supplies Expense	$ 396	$ 701	$ 1,372	$ 3,284	$ 2,585	$ 4,875	$ 3,755	$ 9,489	$ 7,030	$ 11,113	$ 7,709	$ 7,850	$ 7,013	$ 7,049
Facilities & Equipment Expense	$ 93	$ 193	$ 317	$ 1,940	$ 1,258	$ 3,119	$ 1,947	$ 6,504	$ 3,881	$ 7,112	$ 3,440	$ 3,376	$ 2,372	$ 2,392
Service and Other Expense	$ 146	$ 355	$ 759	$ 2,620	$ 2,088	$ 4,193	$ 3,107	$ 8,295	$ 5,767	$ 9,451	$ 5,932	$ 5,962	$ 5,015	$ 5,039
Financial Aid	$ 412	$ 496	$ 562	$ 627	$ 898	$ 1,220	$ 2,503	$ 3,670	$ 4,253	$ 4,837	$ 4,837	$ 4,837	$ 4,837	$ 4,837
Transition Capital Spending	$ 2,083	$ 1,145	$ 87	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Library Costs (Non-Salary)	$ 510	$ 663	$ 779	$ 894	$ 970	$ 1,008	$ 1,038	$ 1,068	$ 1,120	$ 1,120	$ 1,120	$ 1,120	$ 1,120	$ 1,120
Operating and Technology Contingency	$ 1,884	$ 1,955	$ 2,632	$ 3,597	$ 3,820	$ 5,424	$ 5,255	$ 6,680	$ 3,724	$ 4,250	$ 4,365	$ 4,460	$ 4,545	$ 4,586
TOTAL OPERATING EXPENSES	**$ 11,826**	**$ 14,567**	**$ 18,452**	**$ 28,639**	**$ 31,585**	**$ 45,820**	**$ 52,617**	**$ 82,312**	**$ 77,302**	**$ 97,752**	**$ 88,806**	**$ 89,971**	**$ 87,502**	**$ 87,596**
NET FUNDING EXCESS (DEFICIT) BEFORE FUND RAISING	**$ (2,593)**	**$ (4,978)**	**$ (6,916)**	**$ (15,552)**	**$ (14,350)**	**$ (21,321)**	**$ (15,241)**	**$ (28,923)**	**$ (16,764)**	**$ (27,330)**	**$ (16,752)**	**$ (16,675)**	**$ (13,186)**	**$ (13,141)**
CUMMULATIVE NET FUNDING EXCESS (DEFICIT) BEFORE FUND RAISING	**$ (2,593)**	**$ (7,571)**	**$ (14,487)**	**$ (30,039)**	**$ (44,389)**	**$ (65,710)**	**$ (80,951)**	**$ (109,874)**	**$ (126,638)**	**$ (153,968)**	**$ (170,720)**	**$ (187,395)**	**$ (200,581)**	**$ (213,723)**
ESTIMATED IMPACT OF FUND RAISING ASSUMPTIONS														
NET FUNDING EXCESS (DEFICIT) BEFORE FUND RAISING	**$ (2,593)**	**$ (4,978)**	**$ (6,916)**	**$ (15,552)**	**$ (14,350)**	**$ (21,321)**	**$ (15,241)**	**$ (28,923)**	**$ (16,764)**	**$ (27,330)**	**$ (16,752)**	**$ (16,675)**	**$ (13,186)**	**$ (13,141)**
Fundraising Unrestricted Gifts and Endowment Income	$ 186	$ 186	$ 1,625	$ 4,897	$ 8,235	$ 11,661	$ 15,178	$ 13,411	$ 13,934	$ 14,581	$ 15,237	$ 15,903	$ 16,579	$ 17,266
ADJUSTED FUNDING EXCESS (DEFICIT)	**$ (2,407)**	**$ (4,792)**	**$ (5,291)**	**$ (10,655)**	**$ (6,115)**	**$ (9,659)**	**$ (63)**	**$ (15,511)**	**$ (2,830)**	**$ (12,749)**	**$ (1,515)**	**$ (772)**	**$ 3,393**	**$ 4,124**
CUMULATIVE ADJUSTED FUNDING EXCESS (DEFICIT)	**$ (2,407)**	**$ (7,199)**	**$ (12,490)**	**$ (23,145)**	**$ (29,260)**	**$ (38,920)**	**$ (38,983)**	**$ (54,494)**	**$ (57,324)**	**$ (70,073)**	**$ (71,588)**	**$ (72,360)**	**$ (68,966)**	**$ (64,842)**

Appendix F – Exhibit 2: Functional Summary of Annual Projected Operating Budget Plan for Period 2008-09 through 2021-22

	Fiscal Year Ending (in thousands)												
	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022
Research Enterprise														
Identified Sources of Funding														
Total Federal and Private Research	$ 2,696	$ 3,770	$ 6,650	$ 8,220	$ 8,400	$ 10,690	$ 11,440	$ 17,870	$ 19,270	$ 23,920	$ 25,270	$ 26,300	$ 27,170	$ 27,250
Other Funding and Carry Forward	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Initial Complements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
ICR Group III Allocation	$ 117	$ 164	$ 290	$ 358	$ 366	$ 466	$ 498	$ 778	$ 839	$ 1,042	$ 1,101	$ 1,145	$ 1,183	$ 1,187
Other Initial Complement Funding	$ 384	$ 936	$ 260	$ 5,292	$ 3,184	$ 8,684	$ 4,652	$ 18,872	$ 10,461	$ 20,358	$ 8,799	$ 8,205	$ 4,817	$ 4,813
Total Identified Sources of Funding	**$ 3,197**	**$ 4,870**	**$ 7,200**	**$ 13,870**	**$ 11,950**	**$ 19,840**	**$ 16,590**	**$ 37,520**	**$ 30,570**	**$ 45,320**	**$ 35,170**	**$ 35,650**	**$ 33,170**	**$ 33,250**
Uses of Funds														
Faculty Salaries, Wages and Benefits (y-component)	$ 572	$ 797	$ 948	$ 1,572	$ 1,714	$ 2,207	$ 2,292	$ 3,780	$ 3,941	$ 5,026	$ 5,138	$ 5,284	$ 5,333	$ 5,333
Staff Salaries, Wages and Benefits	$ 2,462	$ 3,370	$ 4,519	$ 5,423	$ 5,598	$ 6,916	$ 7,308	$ 11,734	$ 12,495	$ 15,513	$ 16,006	$ 16,302	$ 16,571	$ 16,571
S&E Costs	$ 164	$ 703	$ 1,733	$ 6,875	$ 4,638	$ 10,717	$ 6,990	$ 22,006	$ 14,134	$ 24,781	$ 14,026	$ 14,064	$ 11,266	$ 11,346
Total Uses of Funds	**$ 3,197**	**$ 4,870**	**$ 7,200**	**$ 13,870**	**$ 11,950**	**$ 19,840**	**$ 16,590**	**$ 37,520**	**$ 30,570**	**$ 45,320**	**$ 35,170**	**$ 35,650**	**$ 33,170**	**$ 33,250**
Net Funding Excess (Deficit) for Research	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
GME Enterprise														
Identified Sources of Funding														
State Funds	$ -	$ -	$ -	$ -	$ 702	$ 1,620	$ 2,890	$ 3,457	$ 3,970	$ 4,321	$ 4,321	$ 4,321	$ 4,321	$ 4,321
GME Affiliation Revenue	$ -	$ -	$ -	$ -	$ 2,145	$ 4,950	$ 8,828	$ 10,560	$ 12,128	$ 13,200	$ 13,200	$ 13,200	$ 13,200	$ 13,200
Total Sources of Funds	**$ -**	**$ -**	**$ -**	**$ -**	**$ 2,847**	**$ 6,570**	**$ 11,717**	**$ 14,017**	**$ 16,098**	**$ 17,521**	**$ 17,521**	**$ 17,521**	**$ 17,521**	**$ 17,521**
Uses of Funds														
Faculty Salaries, Wages and Benefits	$ -	$ 192	$ 712	$ 1,329	$ 2,652	$ 3,705	$ 4,646	$ 5,263	$ 5,768	$ 6,288	$ 6,288	$ 6,288	$ 6,288	$ 6,288
Resident Salaries, Wages and Benefits	$ -	$ -	$ -	$ -	$ 1,352	$ 3,289	$ 6,123	$ 7,404	$ 8,678	$ 9,646	$ 9,646	$ 9,646	$ 9,646	$ 9,646
Staff Salaries, Wages and Benefits	$ -	$ -	$ 367	$ 638	$ 796	$ 796	$ 796	$ 796	$ 796	$ 796	$ 796	$ 796	$ 796	$ 796
S&E	$ -	$ -	$ 75	$ 150	$ 283	$ 333	$ 394	$ 471	$ 541	$ 589	$ 589	$ 589	$ 589	$ 589
Total Use of Funds	**$ -**	**$ 192**	**$ 1,154**	**$ 2,117**	**$ 5,083**	**$ 8,123**	**$ 11,959**	**$ 13,933**	**$ 15,782**	**$ 17,319**	**$ 17,319**	**$ 17,319**	**$ 17,319**	**$ 17,319**
Net Funding Excess (Deficit) for GME	**$ -**	**$ (192)**	**$ (1,154)**	**$ (2,117)**	**$ (2,236)**	**$ (1,553)**	**$ (241)**	**$ 84**	**$ 315**	**$ 202**	**$ 202**	**$ 202**	**$ 202**	**$ 202**
Academic Enterprise / Dean's Office														
Identified Sources of Funding														
State Funds	$ 2,349	$ 2,451	$ 2,451	$ 2,451	$ 3,758	$ 4,928	$ 10,083	$ 15,278	$ 17,952	$ 20,626	$ 20,787	$ 20,908	$ 20,988	$ 21,028
Student Fees	$ 984	$ 1,054	$ 1,054	$ 1,054	$ 1,437	$ 1,845	$ 3,637	$ 5,445	$ 6,379	$ 7,312	$ 7,375	$ 7,422	$ 7,453	$ 7,469
UCOP / Campus Support for Transition Capital Spending	$ 2,083	$ 1,145	$ 87	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
UC Biomedical Sciences Program Instructional Support	$ 1,004	$ 1,004	$ 1,004	$ 1,004	$ 427	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Less: Transfer of Funds for Initial Complements	$ (384)	$ (936)	$ (260)	$ (5,292)	$ (3,184)	$ (8,684)	$ (4,652)	$ (18,872)	$ (10,461)	$ (20,358)	$ (8,799)	$ (8,205)	$ (4,817)	$ (4,813)
Total Identified Sources of Funding	**$ 6,036**	**$ 4,718**	**$ 4,336**	**$ (783)**	**$ 2,438**	**$ (1,911)**	**$ 9,069**	**$ 1,852**	**$ 13,870**	**$ 7,581**	**$ 19,363**	**$ 20,125**	**$ 23,624**	**$ 23,684**
Uses of Funds														
Faculty Salaries, Wages and Benefits (base-component)	$ 1,579	$ 1,740	$ 1,740	$ 2,247	$ 2,393	$ 2,966	$ 5,432	$ 7,522	$ 8,425	$ 10,038	$ 10,248	$ 10,386	$ 10,473	$ 10,473
Community Based Physicians Stipends	$ 631	$ 646	$ 646	$ 646	$ 702	$ 839	$ 2,246	$ 2,615	$ 3,679	$ 3,743	$ 3,579	$ 3,583	$ 3,412	$ 3,385
Dean's Office Salaries, Wages and Benefits	$ 1,058	$ 2,313	$ 3,011	$ 3,822	$ 4,759	$ 5,264	$ 6,168	$ 7,493	$ 7,746	$ 8,818	$ 9,702	$ 10,081	$ 10,081	$ 10,081
Staff Salaries, Wages and Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
S&E	$ 5,361	$ 4,806	$ 4,700	$ 5,937	$ 6,698	$ 8,788	$ 10,222	$ 13,229	$ 11,100	$ 12,513	$ 12,788	$ 12,953	$ 13,047	$ 13,088
Total Uses of Funds	**$ 8,629**	**$ 9,505**	**$ 10,097**	**$ 12,652**	**$ 14,552**	**$ 17,856**	**$ 24,068**	**$ 30,858**	**$ 30,950**	**$ 35,113**	**$ 36,317**	**$ 37,002**	**$ 37,013**	**$ 37,027**
Net Funding Excess (Deficit) for Academic/Dean's Office	**$ (2,593)**	**$ (4,786)**	**$ (5,762)**	**$ (13,435)**	**$ (12,114)**	**$ (19,768)**	**$ (15,000)**	**$ (29,007)**	**$ (17,079)**	**$ (27,532)**	**$ (16,954)**	**$ (16,878)**	**$ (13,388)**	**$ (13,344)**
Cumulative	**$ (2,593)**	**$ (7,379)**	**$ (13,141)**	**$ (26,576)**	**$ (38,690)**	**$ (58,458)**	**$ (73,458)**	**$ (102,464)**	**$ (119,544)**	**$ (147,076)**	**$ (164,030)**	**$ (180,907)**	**$ (194,296)**	**$ (207,639)**
Summary														
Total Sources of Funds	$ 9,234	$ 9,589	$ 11,536	$ 13,087	$ 17,235	$ 24,499	$ 37,376	$ 53,389	$ 60,538	$ 70,422	$ 72,054	$ 73,296	$ 74,316	$ 74,455
Total Uses of Funds	$ 11,826	$ 14,567	$ 18,452	$ 28,639	$ 31,585	$ 45,820	$ 52,617	$ 82,312	$ 77,302	$ 97,752	$ 88,806	$ 89,971	$ 87,502	$ 87,596
CUMMULATIVE NET FUNDING EXCESS (DEFICIT) BEFORE FUND RAISING	**$ (2,593)**	**$ (4,978)**	**$ (6,916)**	**$ (15,552)**	**$ (14,350)**	**$ (21,321)**	**$ (15,241)**	**$ (28,923)**	**$ (16,764)**	**$ (27,330)**	**$ (16,752)**	**$ (16,675)**	**$ (13,186)**	**$ (13,141)**
Fundraising Unrestricted Gifts and Endowment Income	$ 186	$ 186	$ 1,625	$ 4,897	$ 8,235	$ 11,661	$ 15,178	$ 13,411	$ 13,934	$ 14,581	$ 15,237	$ 15,903	$ 16,579	$ 17,266
Net Funding Excess (Deficit)	**$ (2,407)**	**$ (4,792)**	**$ (5,291)**	**$ (10,655)**	**$ (6,115)**	**$ (9,659)**	**$ (63)**	**$ (15,511)**	**$ (2,830)**	**$ (12,749)**	**$ (1,515)**	**$ (772)**	**$ 3,393**	**$ 4,124**
Cumulative Net Income (Debt)	**$ (2,407)**	**$ (7,199)**	**$ (12,490)**	**$ (23,145)**	**$ (29,260)**	**$ (38,920)**	**$ (38,983)**	**$ (54,494)**	**$ (57,324)**	**$ (70,073)**	**$ (71,588)**	**$ (72,360)**	**$ (68,966)**	**$ (64,842)**

Appendix F – Exhibit 3: Summary of Significant Operating Assumptions for Projected Operating Budget Plan

Unless otherwise indicated, all assumptions are in academic year 2006-07 dollars and are not inflated in the financial models presented.

Revenue Funding Assumptions

- **State Funds:** State funds to be received to support medical school operations are calculated on a per student or resident basis. Per student and resident amounts represent incremental marginal cost of instruction (MCOI) funds that are applied to incremental growth in student populations within the school beginning in 2012-13 (initial year of the medical school). Per student amounts assumed by type of student are summarized as follows:
  - $50,266 per medical student
  - $8,036 per Ph.D. student
  - $27,008 per resident

- **Student Fees:** Student fees represent the annual medical school value of the professional school and education fee for medical students, and educational fee for Ph.D. students. Per student amounts assumed are summarized as follows:
  - $14,004 Profession fee per medical student
  - $3,417 Education fee per medical student
  - $3,126 Education fee per Ph.D.

- **Indirect Cost Recovery (ICR):** Projected amount Group III amounts assumed to be allocated to the medical school based on direct grant and contract revenue and the current campus allocation methodology. Assumptions include 75 percent of direct grant and contract revenue is federal (with a 32 percent cost recovery factor), and 25 percent is private (with a 17 percent cost recovery factor).

- **Graduate Medical Education (GME) Affiliation Revenue**: Projected amount of revenue to be received from negotiated hospital affiliation agreements where UCR residents are being trained. Model assumes an annual average amount per resident of $82,500.

- **UCOP or Campus Support for Transition Capital:** Funding assumed to be received by medical school to cover the costs of renovating the anatomy lab and Biomedical Sciences space. Capital costs equal to funding assumed is reported as an operating expense.

- **UCR Biomedical Sciences Program Instructional Support:** Amounts that are currently received from various sources that include UCOP, UCLA, and the office of the chancellor to support academic or research programs. All of these funding amounts are projected to be phased out and eliminated by 2013-14.

Operating Expense Assumptions

- **Faculty Compensation and Benefits:** Compensation for 111 basic science, clinical research scientists, and clinical teaching faculty are based on UC-systemwide averages by rank and type, where applicable, or by average Medical Group Management Association (MGMA) academic faculty data for clinical specialty faculty. Salaries range from a low of $92,000 to a high of $256,000 per FTE. Fringe benefits are calculated assuming 18.5 percent of salary cost.

- **Community Clinical Physician Stipends:** Compensation and stipend payments per physician FTE equivalent related to the voluntary faculty category. Community clinical physicians are assumed to support clinical teaching requirements of the four-year medical school and intern and resident GME program.

- **Staff Compensation and Benefits:** Staff compensation include the medical school dean, the seven associate and assistant deans, support staff in the dean's office, and research support staff (i.e., post docs, graduate research students, research lab technicians, other research support). By academic year 2021-22 total staff FTEs are approximately 480 in this category. Compensation amounts are assumed based on UC averages and include the following salaries per FTE amounts.
  - $450,000 per dean
  - $235,000 per associate dean
  - $150,000 per assistant dean
  - $49,300 dean's office staff FTE
  - $20,000 to $53,900 for research support staff FTE

Fringe benefits are based on level of salary per FTE and ranges from 18.5 percent to 36 percent.

- **Resident Compensation and Benefits:** Compensation per resident FTE varies by post-graduate year (PGY) and is based on UC Davis resident salaries, adjusted for work group input on comparable salaries in other Southern California residency programs. Salary per FTE ranges from $43,300 for first year resident to $65,000 for a fifth year resident position. Fringe benefits are calculated assuming 20 percent of salary cost.

- **Non-Salary Expenses (i.e. supplies, equipment, facilities, services and other):** Amounts calculated based on historical levels and estimates of fixed and variable components. Variable components used costs drivers such as student enrollment, faculty FTEs, medical school FTEs, etc. to estimate cost changes in proportion to growth in medical school revenues.

- **Financial Aid:** Financial aid assumed to support medical student aid and scholarships, and support provided for the Medical Scholars and FastStart outreach programs. Financial aid for medical students and is projected to increase from current level of approximately 19 percent of total medical student fees to a level of 50 percent of student. Current components related to Medical Scholars and FastStart programs held constant.

- **Research Discretionary Spending:** Represents portion of initial complement funds available to PIs to support equipment acquisitions and/or enhancements to research programs in excess of projected core levels of support.

- **Transition Capital Spending:** Capital spending associated with renovations to transition space for anatomy lab and Biomedical Sciences. Funding assumed from UCOP or campus funds.

- **Library Costs (Non-Salary):** Estimated costs for print and e-resources to support growth of medical school students and faculty.

- **Operating and Technology Contingency:** Administrative contingency that has been included in the model to account for incremental new costs that have not been separately identified in this process. Examples of expenses include instructional technology and equipment, initial complements for dean level faculty, unanticipated recruitment costs, and special equipment. Amount of contingency has been calculated as a percentage of total revenues and ranges from 20 percent in 2008-09, decreasing to 5 percent in 2016-17 and thereafter.

Fund Raising, Gifts, and Endowment Assumptions

UCR is planning an aggressive fundraising campaign to support the costs of start-up and growth in the School of Medicine. Fundraising estimates are projected to develop a stream of funds that are intended to supplement investments in the medical school, but not supplant the operating and capital support for the school that will be required from the state of California. Funds assumed include the income on endowment earnings and unrestricted gifts which will be available for the general operations of the medical school. The amounts assumed are shown as a reduction in total investments required in the presentation of the financial models. Specific operating assumptions related to fundraising, gifts and endowments include the following:

- The medical school will receive $25 million in gift and endowment pledges per year beginning in 2009-2010, each of which will be amortized to cash over a five-year period.
- Between 2008-09 and 2014-15, 65 percent of fundraising will be unrestricted gifts and 35 percent endowments. Beginning in 2015-16, the ratio is assumed to be 50/50.
- Investment earnings on endowment balances accruing to the medical school is five percent.

APPENDIX G. CAPITAL AND INFRASTRUCTURE

Exhibit 1: UCR Campus Map

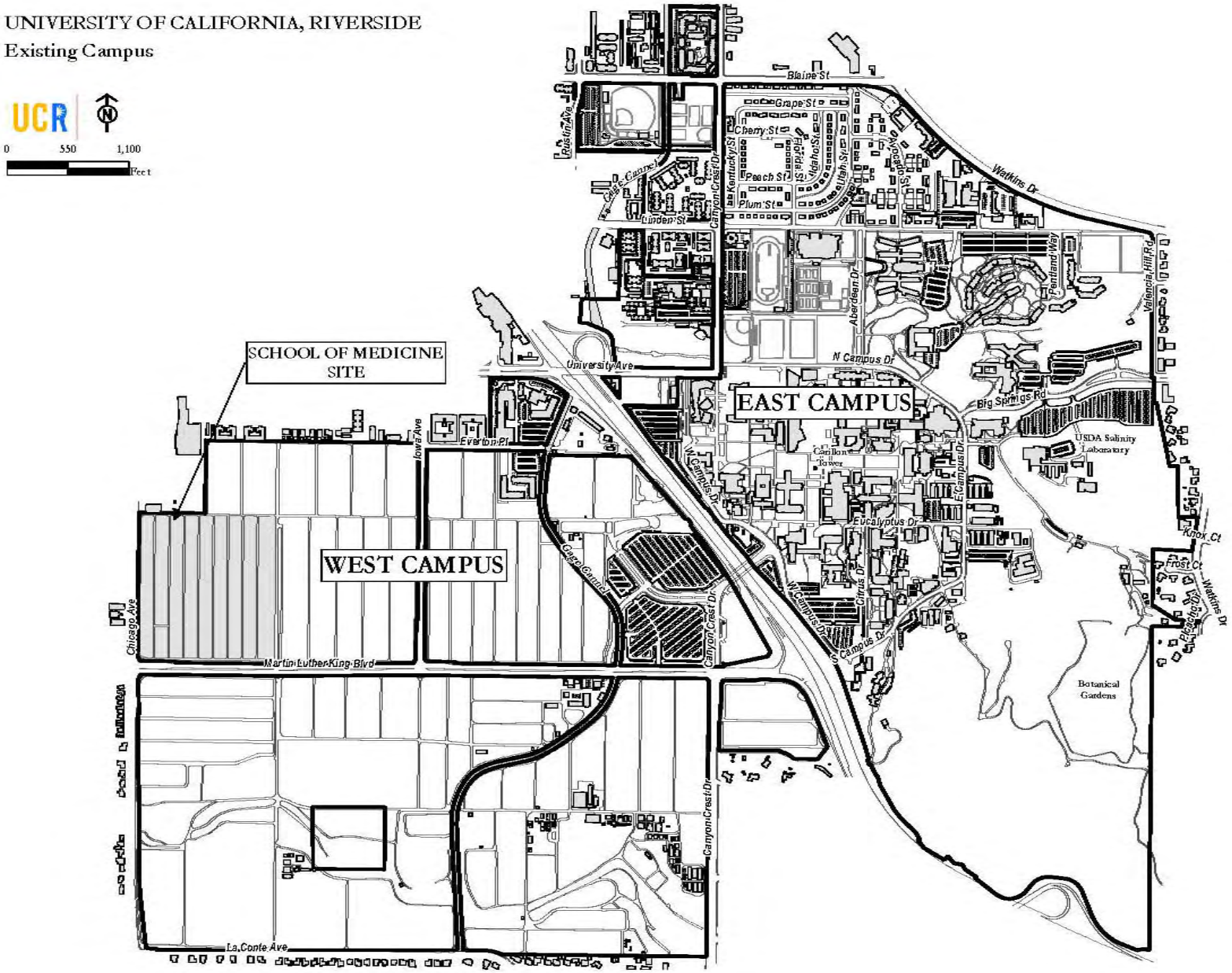
Exhibit 2: West Campus Development Plan with Proposed School of Medicine Location

Exhibit 3: UCR School of Medicine Development Plan with Initial Build-out

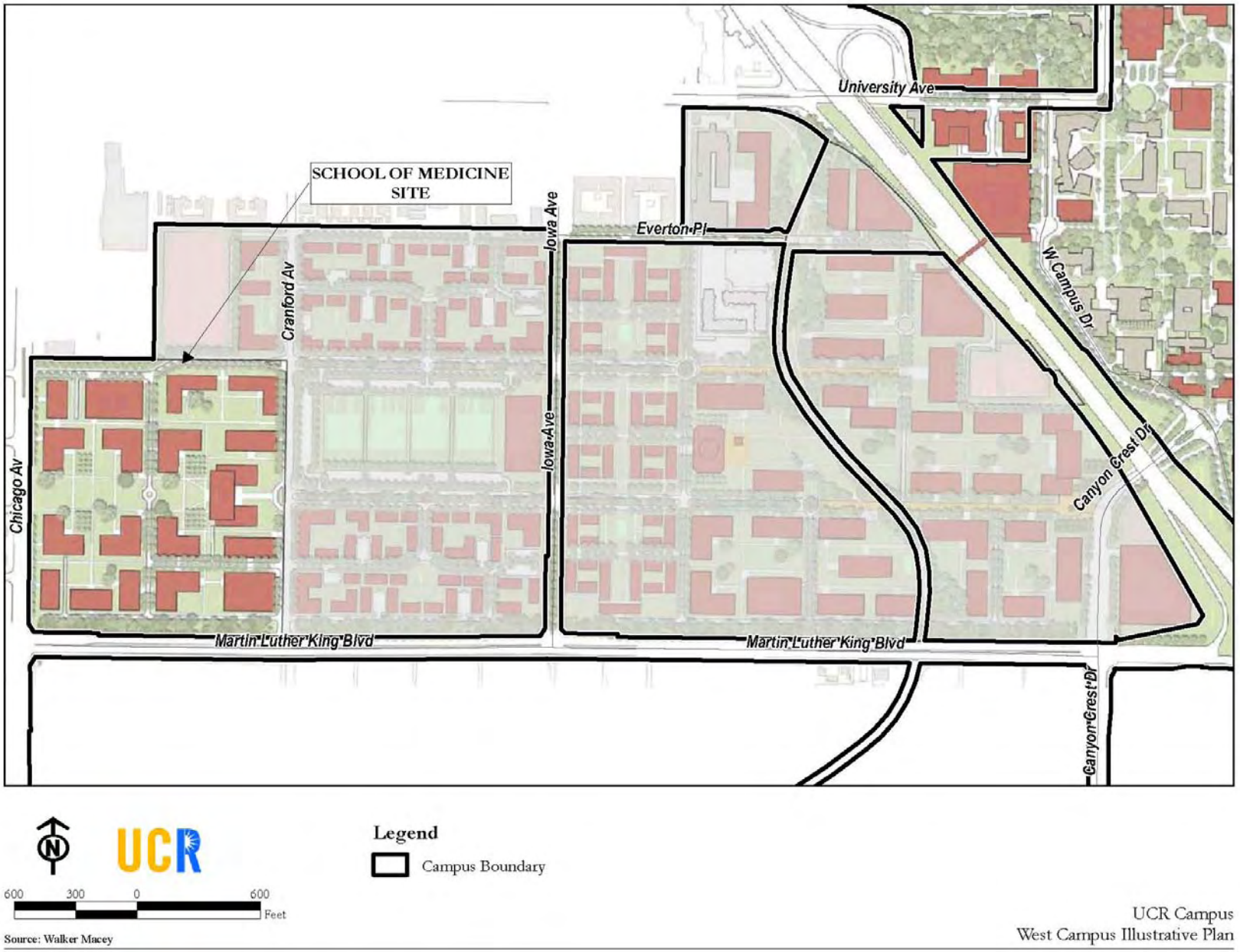
Exhibit 4: Capital Projects

Exhibit 5: UCR School of Medicine Capital Project Plan

Appendix G – Exhibit 1: UCR Campus Map



Appendix G – Exhibit 2: West Campus Development Plan with Proposed School of Medicine Location



Appendix G – Exhibit 3: UCR School of Medicine Development Plan with Initial Build-out

Appendix G – Exhibit 4: Capital Projects

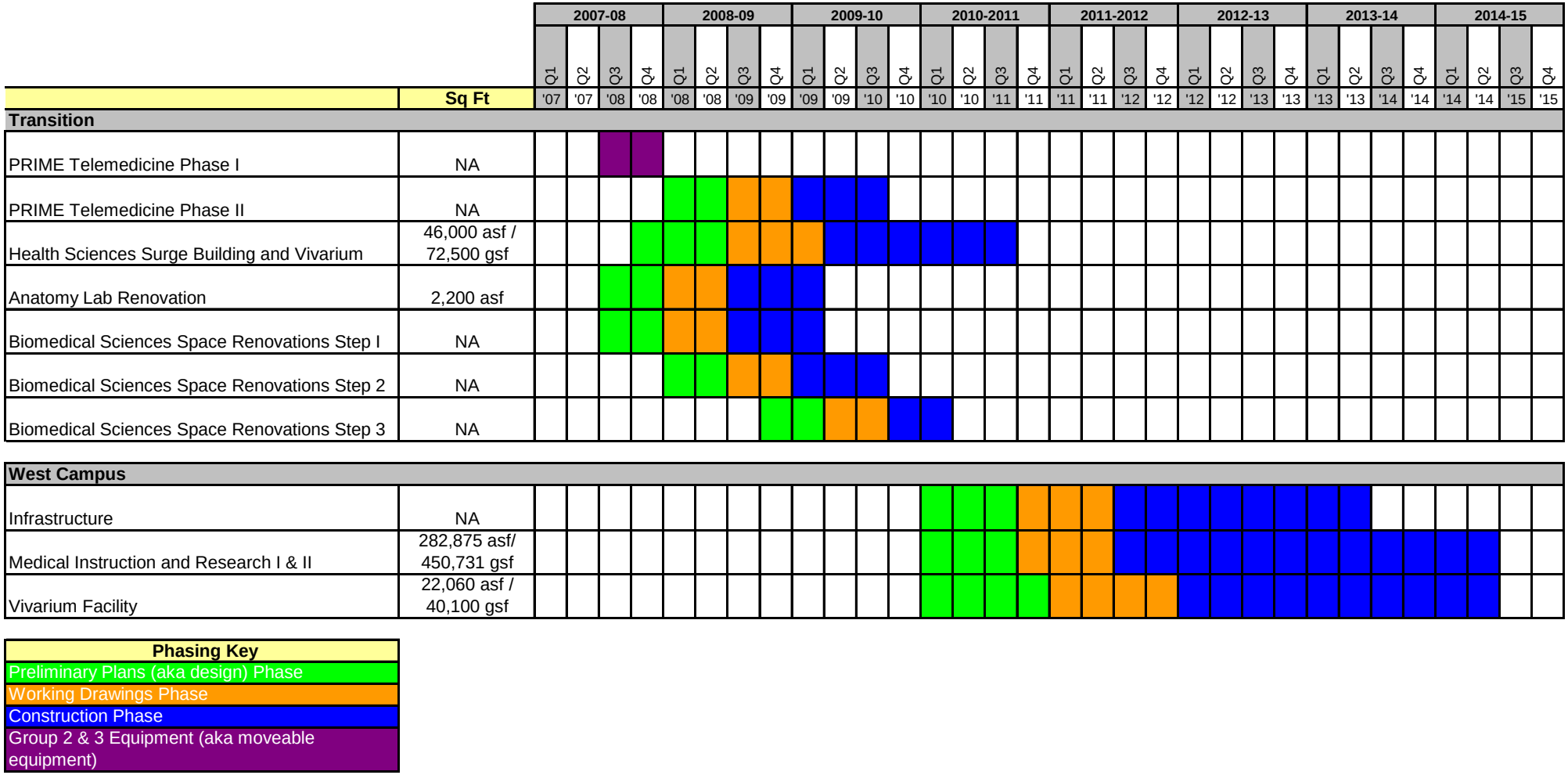
Transition Phase

- **PRIME Telemedicine Phase I:** The concept program equips Biomedical Sciences instructional space and regional hospital partners with networked displays, video conferencing capability, "smart" classrooms, "smart" conference room, and networked mock exam spaces.
- **PRIME Telemedicine Phase II:** The concept program expands Biomedical Sciences teaching space capacity associated with net new PRIME enrollment, provides a simulation lab, and enhances tele-education capabilities in a lecture hall for Biomedical Sciences PRIME/Telemedicine program use.
- **Health Sciences Surge Building and Vivarium:** (39,000 assignable square feet [asf]/61,000 gross square feet [gsf] – new space) The concept program assumes an open lab environment, associated research support/core space, offices, and office support areas. Associated components include pre-construction site demolition, clearance, and realignment of existing utilities. Vivarium space will include enhancements for an ABSL-3 capable suite to support animal research with specialized containment needs.
- **Health Sciences Surge Vivarium:** (7,000 asf/12,500 gsf – all new space) The concept program assumes a procedure room/holding room ratio: 1:2. Project concept includes possibility of modular facilities.
- **Anatomy Lab Renovation:** (2,200 asf – renovated existing space) The concept program assumes 10 anatomy tables. Support space includes model room, offices, and locker room and wash areas.
- **Biomedical Sciences Space Renovations Step 1:** (Renovated existing space) The concept program renovates and reconfigures approximately 2,100 asf in the first floor of the Statistics Building. Future uses will include Biomedical Sciences dean's office support space, as well as clinical medical education space.
- **Biomedical Sciences Space Renovations Step 2:** (Renovated existing space) The concept program renovates and reconfigures approximately 2,100 asf in the first floor of the Statistics Building, as well as 1,900 asf in one of the Biomedical Sciences modular facilities. The Statistics Building space will be reconfigured to accommodate the dean's office and direct reports. The modular facility will be reconfigured to provide several PBL spaces, as well as student study space.
- **Biomedical Sciences Space Renovations Step 3:** (Renovated existing space) The concept program renovates and reconfigures approximately 1,500 asf in the basement of the Statistics Building. The space will be reconfigured to accommodate net new mock exam rooms, instructional support staff offices, and student study space.

West Campus Phase

- **Infrastructure:** The concept program assumes site utilities and connections to municipal services; central plant (chillers and boilers) to support total initial development; roadways; and incidental hardscape and landscape.
- **Medical Instruction and Research Facilities:** (282,875 asf/450,731 gsf – all new space) The concept program assumes a class size of 100 FTE students for each of the four years of the medical school. The concept program assumes 50-65 FTE principal investigators; 1,200-1,500 asf per primary research lab/investigator.
- **Vivarium Facility:** (22,060 asf/40,100 gsf) The concept program assumes 55 FTE principal investigators; average of 500 rodents per primary research investigator (27,000 total); single corridor system; procedure room/holding room ratio: 1:2; 140- cage ventilated racks.

Appendix G – Exhibit 5: UCR School of Medicine Capital Project Plan[49]



[49] Q1: July-Sept.; Q2: Oct-.Dec.; Q3: Jan.-March; Q4: April-June

APPENDIX H. LETTERS OF ENDORSEMENT

Exhibit 1: Letter from Vice Dean for Education David M. Irby, School of Medicine, UCSF

Exhibit 2: Letter from Vice Chancellor and Dean, Human Health Sciences, Claire Pomeroy, School of Medicine, UC Davis

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Exhibit 1: Letter from Vice Dean for Education David M. Irby, School of Medicine, UCSF

University of California
San Francisco

UCSF

School of Medicine

February 4, 2008

David M. Irby, Ph.D.
Vice Dean for Education
Office of Medical Education
521 Parnassus Avenue
Room C-254
San Francisco, CA
94143-0410
tel. 415/502-1633
fax 415/514-0468
email: irby@medsch.ucsf.edu
http://medschool.ucsf.edu/education/

Interim Chancellor Robert Grey
Office of the Chancellor
University of California, Riverside
4108 Hinderaker Hall
900 University Avenue
Riverside, California 92521

Dear Dr. Grey:

Dr. Sam Hawgood, Interim Dean of the UCSF School of Medicine and I are pleased to support the proposed curriculum plan for the UC Riverside School of Medicine. I am very familiar with every aspect of curricular planning and implementation, UCLA's curriculum, and LCME accreditation standards. In addition, I am a Senior Scholar at The Carnegie Foundation for the Advancement of Teaching and am completing a four year national study of medical education. We site visited 14 medical schools and have reviewed the literature on the learning sciences. By way of full disclosure, I know and respect Dr. Phyllis Guze, your Executive Director for Medical School Planning.

I was delighted to read your proposal, which represents the best elements of curricular design and pedagogical innovation. The integrated curriculum and use of case-based learning and limitations on lecture hours are in line with the UCLA and UCSF curricula and best practices nationally. The emphasis upon defined competencies and comprehensive assessment is exemplary. In the clinical years, the blend of medical-center based learning and community/ambulatory experiences is well conceived. The fourth year designed around academies mimics the highly successful UCLA college model. In short, this is an excellent curriculum model. The grand design is elegant and expresses well the mission of the school. There are no missing elements.

By way of context, let me outline a few key recommendations that will come out of our Carnegie report on medical education and how they relate to your proposed curriculum. The first recommendation will be to increase clinical experience in the first two years and reducing the front loading of scientific facts by spreading it out over four years. This recommendation calls for doing away with the 2 + 2 curriculum (two years of basic sciences and two years of clinical clerkships). The key to learning medicine is the ability to connect and integrate multiple forms of knowledge (factual and experiential) and the best way to do so is by learning them together. This model would have clinical experience drive learning of facts (like problem-based learning seeks to do) and would more evenly balance clinical experience and factual learning over four years. Your curriculum model follows the current 2 + 2 model and to my knowledge no medical school has done an integrated four year model yet. However, this will begin to change rather rapidly when USMLE Step 1 (the national licensing exam over basic science knowledge that is taken at the end of the second year) goes away in the next several years.

Second, we recommend an integrated, longitudinal clinical experience that is

patient-centered and balances academic medical center and community hospital/clinics experiences. We will be stressing the importance of longitudinal relationships between faculty and students and students and patients. Your proposed model meets this criterion well. Other medical schools do a similar academic medical center in-patient experience for a third to half of the year and then send students out into the community for a predominantly ambulatory clinical experience. Examples include the University of Washington WRITE program and the University of Minnesota RPAP program. Other medical schools assert that six months with a panel of patients is inadequate and have designed a full year longitudinal experience. Examples include Harvard's Cambridge integrated Clerkship, UCSF's Parnassus Integrated Clerkship Experience, and South Dakota's Yankton Experience.

Your proposal to have students spend half of the third year in community hospitals and clinics may attract the ire of some faculty members who assert that only full-time, physician-scientist faculty members in academic medical centers can adequately teach students and residents. This argument was advanced by Abraham Flexner 100 years ago to address the lack of scientific rigor in the profession at the time – an argument that no longer holds today. We have decades of experience and empirical evidence that disputes this argument. In addition, academic medical centers today are difficult learning environments for students because of the high acuity, complex technology and rapid turnover of patients, the discontinuity in every aspect of the system, and the ceding of teaching to residents who are themselves overwhelmed. Thus, your proposed community experience combined with inpatient experience at an academic medical center provides a nice balance for the learners. I strongly support this option.

Our third recommendation is to focus on professional formation. Your proposal speaks to the sequential development of professionalism, professional identity and altruism.

The fourth recommendation is to engage learners in knowledge building, inquiry, discovery and improvement. The tools of scholarship build habits of mind that challenge existing wisdom and practice in order to advance human health. Your curriculum addresses this need.

In conclusion, the curriculum being proposed is excellent and meets the existing and emerging standards for medical education.

Sincerely yours,

David M. Irby, PhD
Professor of Medicine
Vice Dean for Education
Senior Scholar, The Carnegie Foundation for the Advancement of Teaching

Cc: Dr. Sam Hawgood, Interim Dean, UCSF School of Medicine
Dr. Eugene Washington, Executive Vice Chancellor, UCSF

Exhibit 2: Letter from Vice Chancellor and Dean, Human Health Sciences Claire Pomeroy, School of Medicine, UC Davis

UNIVERSITY OF CALIFORNIA, DAVIS

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OFFICE OF THE VICE CHANCELLOR
HUMAN HEALTH SCIENCES

OFFICE OF THE DEAN
SCHOOL OF MEDICINE
TELEPHONE: (916) 734-7131
FAX: (916) 734-7055

UC DAVIS HEALTH SYSTEM

4610 X STREET
SACRAMENTO, CALIFORNIA 95817

MEDICAL SCIENCES 1-C
DAVIS, CALIFORNIA 95616

January 23, 2008

Robert D. Grey, Ph.D.
Acting Chancellor
University of California, Riverside
900 University Avenue
Riverside, CA 92521

Re: Letter of Support for UC Riverside School of Medicine Curriculum

Dear Bob,

The University of California, Riverside is embarking on an exciting journey to establish a comprehensive medical school to serve Inland Southern California. Clearly, all of the UC health sciences campuses must collaborate to best meet the demands of the growing and diverse communities in California.

We appreciated the opportunity to review the proposed curriculum for the UCR School of Medicine. The faculty are to be commended for preparing a robust and contemporary curriculum that will provide a variety of educational experiences for your students. The commitment to problem-based learning and integrated coursework detailed in your proposal is consistent with effective professional education models. I would note that the "doctoring" courses described in your proposal will offer students opportunities for reflection and professional growth. We have found the "doctoring" course at UC Davis to be enormously successful, but do rely on extensive faculty development to ensure the instructors are equipped with strong facilitation skills. Additionally, we were particularly enthusiastic about the two-week Clinical Foundations Course at the beginning of the third year. This course will support the very important transition from the predominately didactic/small-group discussion years to the clerkships.

My colleagues and I have several observations regarding the curriculum that you may find useful as you progress through the process:

- Since the educational competencies span all four years of medical school, it will be important to clearly define who has ultimate accountability for the integrated curriculum.
- An integrated curriculum is, by definition, complex. The SOM faculty will need to address the difficult challenge of how best to evaluate increasing levels of competencies in your nine curricular anchors.
- Given this unique circumstance to create a new curriculum, what is the opportunity for evaluation of both the specific educational model as well as the process to implement the curriculum.

- A challenge facing all medical schools is to effectively provide formative feedback and time for self-reflection.
- The community-based educational experience may serve as a model for all of us who are expanding our programs and we welcome the chance to learn from your evaluation.

We support the proposal for the UC Riverside curriculum and encourage the Academic Senate to give full consideration to this new school.

Please let me know if I can be of assistance in the future.

Best regards,

Claire Pomeroy, M.D., M.B.A.
Vice Chancellor and Dean, Human Health Sciences
UC Davis

Exhibit 3: Letter from Vice Chancellor for Medical Sciences Gerald S. Levey, David Geffen School of Medicine, UCLA

GERALD S. LEVEY, M.D.
VICE CHANCELLOR, MEDICAL SCIENCES
DEAN, SCHOOL OF MEDICINE

David Geffen School of Medicine at UCLA
10833 Le Conte Avenue, 12-138 CHS
Box 951722
Los Angeles, California 90095-1722
310.825.5687 phone
310.206.5046 fax

U C L A

January 10, 2008

Mr. Robert D. Grey
Acting Chancellor
University of California, Riverside
900 University Avenue
Riverside, CA 92521

Dear Mr. Grey:

Having had a chance to review the extensive planning document describing the proposed curriculum for the new medical school at the University of California, Riverside, I want to lend my support to this initiative. The first two years, Human Biology and Disease, are proven quality and reflect the basic curriculum that UCLA and the Haider-UCLA program have created together. Student evaluations and performance data indicate that this curriculum is one that promotes deep understanding, an integrative view of medicine and science, and skills in self-directed learning. By maintaining many of the features of the current Human Biology and Disease curriculum as it exists in the Haider-UCLA Program in Biomedical Sciences, the new school will start on a sound footing.

The greater challenge is to develop a clinical curriculum that is responsive to the needs of the community while preparing students to practice in a rapidly changing field of medicine or to conduct basic science, clinical, or policy research focused on the improvement of health and health care. The structure of the proposed clinical curriculum provides opportunities for students to learn in the traditional setting of inpatient medicine while preserving a significant amount of curricular time for longitudinal experience during which students can work with teams of providers and patients in a community setting. This type of continuity can be helpful to students in understanding the progress of disease, the challenges patients face in adopting healthy life style behaviors, the role of multiple types of clinical providers, and in observing the outcomes of clinical decisions. At UCLA, we have found that such longitudinal curricular structures also provide an opportunity for students to learn about and become involved in research.

The use of the "college" format as a structure for the fourth year curriculum has been an extremely beneficial innovation at UCLA with students reporting increased access to advising, career mentoring, and role models. I would expect that your adaptation of this approach into an academy structure for the fourth year curriculum would confer similar benefits.

Overall, I am supportive of the curriculum as described. While there remain many details to be worked out in terms of affiliated teaching sites and clinical faculty, you have created a sound curricular foundation. I assume that course leaders on both campuses will continue to work together as this vision unfolds.

Sincerely,

Gerald S. Levey, M.D.
Vice Chancellor, Medical Sciences
Dean, School of Medicine

Exhibit 4: Letter from Vice Chancellor for Health Affairs David N. Bailey, UC Irvine

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David N. Bailey, M.D.
Vice Chancellor for Health Affairs
Dean, School of Medicine
Professor of Pathology & Laboratory Medicine
1001 Health Science Road
252 Irvine Hall
Irvine, CA 92697-3950
e-mail: dnbailey@uci.edu

TEL (949) 824-5926

24 December 2007

ACTING CHANCELLOR ROBERT D. GREY
Chancellor's Office
University of California, Riverside
4108 Hinderaker Hall
Riverside, California 92121

SUBJECT: Review of Proposed UC Riverside School of Medicine Curriculum

Dear Chancellor Grey,

On November 30, 2007, you e-mailed to me the proposed curriculum for the University of California, Riverside School of Medicine and asked that I comment on it. Since others in my office are much better versed in curricular matters than I, I asked Gerald Maguire, M.D., Senior Associate Dean for Educational Affairs, and Harry Haigler, Ph.D., Associate Dean for Basic Science Curriculum to undertake the review.

Both individuals agreed that the first two years of the curriculum is well-tested in that it has been in place in the combined program of UC Riverside and UC Los Angeles. The curriculum overall is well-integrated. Both reviewers also felt that, while the systems-based approach may be a bit chaotic to teach, it is quite admirable. The proposal to integrate content themes throughout the four years is something that has been found to be beneficial at UC Irvine. The skills courses appear to be excellent and include a good level of mentorship and evaluation. One potential concern is that half of the clinical experiences are in community-based programs. This is an excellent approach in theory but will require a high level of faculty development to ensure the quality of the teaching. The fourth year includes scholarly and community projects which will provide sound structure to this period of training. Overall the curriculum was found to be a good one.

Thank for allowing us to provide input into the proposed curriculum. This is indeed an exciting time for all of us as you plan for the first medical school in California in more than 40 years!

With warmest regards,

David N. Bailey, M.D.
Vice Chancellor for Health Affairs
Dean, School of Medicine
Professor of Pathology & Laboratory Medicine

CC: Gerald A. Maguire, M.D.
Harry Haigler, Ph.D.

Exhibit 5: Letter from Vice Dean for Educational Affairs Richard J. Simons, Penn State College of Medicine

PENNSTATE
Milton S. Hershey Medical Center
College of Medicine

Richard J. Simons, M.D.
Vice Dean for Educational Affairs
Professor of Medicine

Penn State Milton S. Hershey Medical Center
Penn State College of Medicine
Office of Medical Education, H176
500 University Drive, P.O. Box 850
Hershey, PA 17033-0850

Tel: (717) 531-3876
Fax: (717) 531-3925
Email: rsimons@psu.edu
www.pennstateeducationalaffairs.com

December 11, 2007

Mr. Robert D. Grey
Acting Chancellor
University of California, Riverside
4108 Hinderaker Hall
Riverside, CA 92521

Dear Chancellor Grey:

I recently had the great pleasure of reviewing the proposed curriculum for the UCR School of Medicine and wish to convey my enthusiastic support for its adoption.

Not only does this curriculum meet all of the necessary educational requirements, but it also is innovative and forward thinking in its approach, especially with regard to the community-based clerkships and medical academies built in to Years 3 and 4. I am confident that the classroom and clinical experiences outlined in the proposed curriculum will provide graduates a strong educational and experiential foundation for a career in medicine.

Sincerely,

Richard J. Simons, M.D., FACP
Vice-Dean for Educational Affairs
Penn State College of Medicine

RJS/dlf

Exhibit 6: Letter from Haile T. Debas, Executive Director, UCSF Global Health Sciences and Chair, UCR School of Medicine External Advisory Board

UCSF GLOBAL HEALTH SCIENCES

To improve health and reduce disease worldwide

3333 California Street, Suite 285
San Francisco, CA 94143-0443
tel: 415.502.6045
fax: 415.502.6052
globalhealthsciences.ucsf.edu

Haile T. Debas, MD
Executive Director

January 16, 2008

Robert D. Grey
Acting Chancellor
University of California, Riverside
4108 Hinderaker Hall
Riverside, CA 92521

Dear Chancellor Grey:

As chair of the External Advisory Board of the proposed UCR School of Medicine, I want to express my support of the curriculum that is under review by the campus Academic Senate.

UCR faculty in the UCR/UCLA Thomas Haider Program in Biomedical Sciences have effectively and successfully delivered the first two years of the curriculum, which is already accredited by the Liaison Committee on Medical Education (LCME). Its integrated approach to biology and disease, incorporating case-based learning and clinical skills from the beginning, facilitates student understanding of the breadth of medical care and instills the importance of lifelong learning.

The Years 3 and 4 curriculum, by providing clinical experiences to students in both medical centers and community-based settings, is mindful of the reality that the majority of medical care occurs outside of the hospital setting. In this regard, UCR will become part of a growing trend in medical education to provide students a more balanced clinical experience.

It has been my pleasure to participate in an advisory capacity in the development of this medical school and I look forward to its launch in 2012.

Yours sincerely,

Haile T. Debas

Haile T. Debas, M.D.
Executive Director
Maurice Galante Distinguished Professor of Surgery
415.502.6045
hdebas@globalhealth.ucsf.edu

UCSF
University of California
San Francisco