

## Department of Pharmaceutical Sciences

### Strategic Plan 2016

#### Department Overview

The Department of Pharmaceutical Sciences was established in 2007 and has met our initial goals for education, faculty, and staff; now we are strongly positioned for further growth.

The department already ranks in the top 10 such departments among the 90 or so ranked by Academic Analytics, based on our strong basic sciences faculty. Our intention is to continue building, first with an equally strong group of clinical research faculty, which will enhance both our graduate and undergraduate programs, as well as future programs. It will be important, however, not to neglect opportunities to build on our existing strengths, particularly in nucleic acid (esp. RNA) biology/chemistry and in drug discovery/development. Our hope is to add several faculty whose research programs bridge basic and clinical areas, i.e., "translational" research.

The current undergraduate program has grown quickly in size and reputation. The B.S. degree in Pharmaceutical Sciences at UC Irvine is the only program of its kind in the UC system; students are trained in a multidisciplinary approach so that they can contribute to the advancement of new pharmaceutical technologies such as accelerated chemical synthesis, molecular-based assays using cloned enzymes and cloned metabolizing enzymes, combinatorial chemistry, in-vitro biopharmaceutical techniques, and gene therapies. The mean GPA for incoming students is 4.0 (compared to the campus average of 3.94). UCI undergraduate students have an 85% acceptance rate into pharmacy schools; in fact, according to PharmCAS, UCI has been the top feeder school to Pharmacy Schools nationwide for the past two years.

In partnership with Chemistry, Biological Sciences, and Pharmacology, we offer a unique interdisciplinary gateway graduate program in Medicinal Chemistry and Pharmacology (MCP) that provides a breadth of expertise that is not easily achievable in any single department, and which uniquely prepares graduates for success in the rapidly changing field of pharmaceutical sciences. This dual goal of specialization, with an interdisciplinary foundation, is accomplished through a one-year initial program of coursework and lab rotations, followed by a transition into one of the participating departments' Ph.D. programs for in-depth specialization and research. For AY 2015-16, 18 of 66 applicants were admitted (27%); 8 accepted the offer (45%).

Additionally, the Departments of Pharmacology and Pharmaceutical Sciences offer an interdisciplinary program leading to a Ph.D. degree in Pharmacological Sciences. The Ph.D. degree prepares students for careers in academic research institutions, the biotechnology and pharmaceutical industry, federal and state agencies, and private research institutions. This program offers intensive research and training in the traditional core discipline of pharmacology as well as in a number of other allied fields such as structural biology, medicinal chemistry, materials science, and others that comprise the pharmaceutical sciences. Students applying to the Ph.D. program choose either a concentration in Pharmacology or a

concentration in Pharmaceutical Sciences. For AY 2015-16, 2 of 20 applicants were admitted (10%); 100% accepted.

## **Strategic Priorities**

### **1) Development of an accredited School of Pharmacy**

A School of Pharmacy will build on the existing strengths and resources of the Department of Pharmaceutical Sciences. The new UC Irvine School of Pharmacy will add a third top-quality Pharmacy School to the UC system, one that partners with existing programs at UCSF and UCSD but also offers students unique training and opportunity. Our mission will be to train practice-ready pharmacists who will serve as healthcare providers in various healthcare services. The program will have a strong foundation in biomedical, pharmaceutical, population, and clinical sciences. The curriculum will foster an interprofessional and interdisciplinary approach to education and training. Healthcare in the U.S. is undergoing a monumental transition from the traditional

A School of Pharmacy is currently in the pre-proposal phase, with the intertwined proposal to offer the Pharm.D. degree. Following approvals at UCI, UCOP, and the accreditation body ACPE, we anticipate enrolling students as early as fall 2019.

To lay the groundwork for the school, a Dean's search will commence this year, after the department's transition into UC Health. Faculty hires in the near future will have Pharm.D. and/or a background in clinical research, in order to build our Pharmacy expertise. Community partnerships will be increasingly important to move toward an integrated system of medicine and pharmacy. We are already working with the Pharmacy Director and her staff at the UCI Medical Center to develop a prototype internship programs for undergraduates. Collaboration with the School of Medicine is critical to the success of a School of Pharmacy, and the key to achieving global impact.

### **2) Growth of undergraduate and graduate programs**

Graduate and undergraduate programs have attracted top students and shown strong growth.

Our undergraduate major has grown from 20 students in 2007 to ~700 students in 2016. As noted above, our graduates are well prepared to pursue careers or graduate/professional education. We continue to develop new lower division courses that effectively prepare our majors for our unique set of upper division requirements.

Our Medicinal Chemistry and Pharmacology (MCP) program attracts students and has facilitated the growth of our Ph.D. program. We now also directly admit students into the Pharmacological Sciences Ph.D. program.

New programs, including Pharm.D., both professional and academic master's, and self-supporting certificate programs in Regulatory Affairs & Compliance, and Business of Pharmacy are in the planning stages.

### **3) Growth of collaborative research partnerships**

The department sees great potential in building up current areas of strength by forming small collaborative units. We will act as a catalyst for focusing several interdisciplinary biomedical research areas at UCI, which would not necessarily require any new faculty. Our Medicinal Chemistry & Pharmacology gateway is one such example, although its primary focus is graduate education. There are several other research disciplines, for example, nanomedicine and molecular evolution, that are represented by outstanding practitioners among existing faculty who are scattered all around campus and the School of Medicine. We hope to spearhead initiatives such as Program Project or Center grants to bring them together, which would further strengthen all of the units involved.

We will support research that has broad impact and that potentially would lead to new high-demand products. Examples include a water quality ELISA assay kit developed by Dr. Chamberlin and licensed to Abraxis, and a bio-sensor developed by Dr. Zhao that will serve as the basis for a new startup company. One indication of the potential in our department is that the chair has referred three faculty to the new UCI Institute for Innovation since its recent establishment.

Global partnerships with pharmacy schools and programs, such as the partnership with EHWA, one of Korea's top pharmacy schools, include funded research collaborations and educational exchange programs.

### **4) Increase Diversity**

We will continue to make efforts to recruit diverse faculty, and diverse graduate students to our programs, including international students, minorities, and women.

At the undergraduate level, women made up 65% of the students enrolled in our department, while black and Hispanic students made up 10% (data as of 2013-14). We are building a strong reputation for our major among incoming freshmen, and are working with local community colleges to attract transfer students. We plan to expand our existing mentoring program to better support underrepresented students. Since our students receive training in basic sciences, they are eligible to enter into STEM fields after graduation.

A School of Pharmacy will broaden our student base and attract diverse students. The American Association of Colleges of Pharmacy reports that 61% of students enrolled in a first professional degree in fall 2013 were women; 12% were underrepresented minorities. These numbers certainly exceed those in typical STEM programs.

Our global partnership with Ewha Women's University College of Pharmacy, begun in 2014, provides opportunities for student and faculty exchanges on an annual basis, increasing cross-cultural knowledge and experience. We are exploring further opportunities for global

partnerships; currently, for example, we are exploring a possible partnership with a university in China and building relationships in Brazil.

### **Conclusion**

The Department maintains strong growth with the unwavering vision of contributing to health education at UCI and meeting California's need for pharmacists with specialized clinical training. We will continue to graduate excellently prepared students at the bachelor's and Ph.D. levels, and conduct transformational research, while developing new programs that build on our existing strengths.