

### From graduate students to professional researchers

City of Hope's Irell & Manella Graduate School of Biological Sciences is an accredited institution where students prepare to become career scientists in biological sciences. The school combines a rigorous academic curriculum with hands-on research time in the lab, leading to a Doctor of Philosophy degree in biological sciences.

The graduate program includes coursework ranging from biochemistry and genetics to stem cell biology, immunology and scientific writing. Students also take two rotations through different laboratories, exposing them to a spectrum of ongoing investigations and giving them practical experience to guide their selection of a research topic. They also build communication skills by participating in professional forums.

**A strong emphasis on translational research fosters students' ability to apply discoveries in basic science to work that will benefit patients.**

This experience prepares them for a lifetime of contributions in academia, government or industry. The school's doctoral graduates go on to prestigious postdoctoral fellowships or positions in biotechnology or university-based research.

In the realm of science, researchers must create and test new hypotheses and be willing to explore the unknown. These explorations often lead to surprising findings that eventually benefit patients. Because City of Hope graduate students take their classes and conduct their research just footsteps away from clinical buildings, they see the men, women and children who could be helped by their work.

**Many students choose City of Hope's graduate school because they want direct, interactive learning experiences.** They seek more than a textbook can provide. City of Hope offers them the opportunity to interact one on one with accomplished scientists and supportive postdoctoral fellows in an environment surrounded by patients who underscore the relevance of their research.

Meanwhile, students in diverse fields such as diabetes and immunology share their ideas with each other, accelerating progress into new avenues of study. Presenting their findings at local and national conferences and publishing in peer-reviewed journals builds confidence and introduces them to the scientific community.

*(continued on page 8)*

*"City of Hope has the perfect balance of all the things I wanted in a graduate program — world-class facilities, readily available equipment and a well-trained staff that can teach me how to use it. Plus, the culture is very supportive. My mentor and the other faculty members are always willing to share their expertise. They've helped me take my research farther than I ever imagined it could go."*

Krist Azizian, Ph.D. candidate and graduate school student

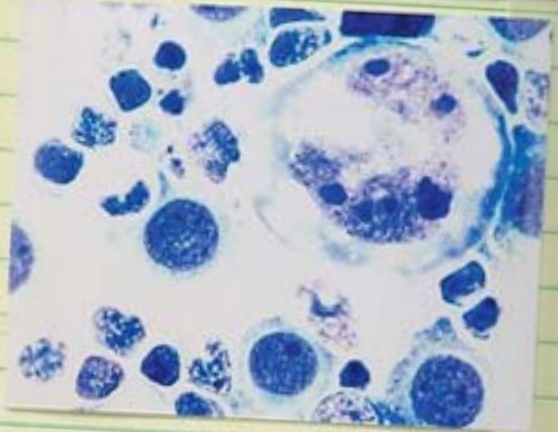


GRADUATE  
STUDIES

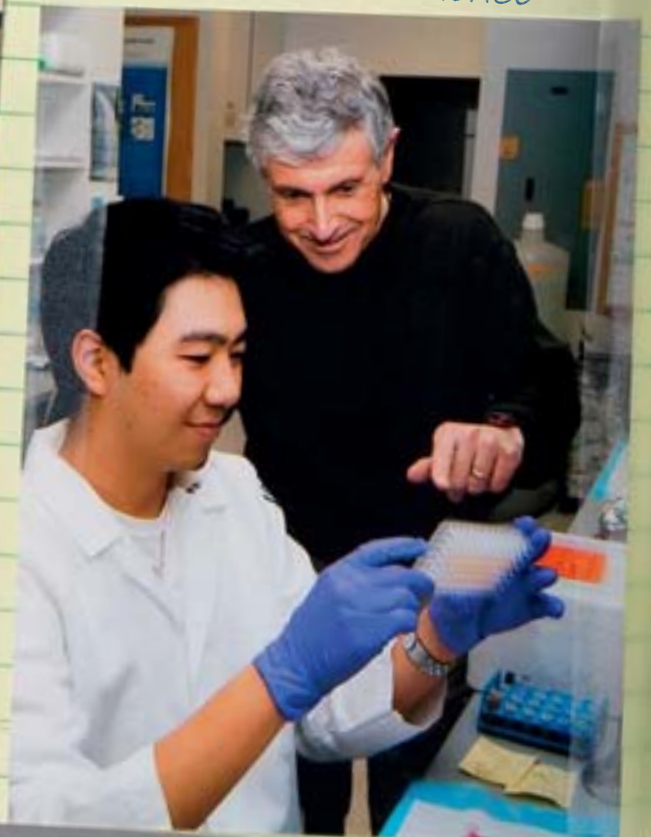
1/2 TIME COURSEWORK &  
1/2 TIME LABORATORY ROTATION

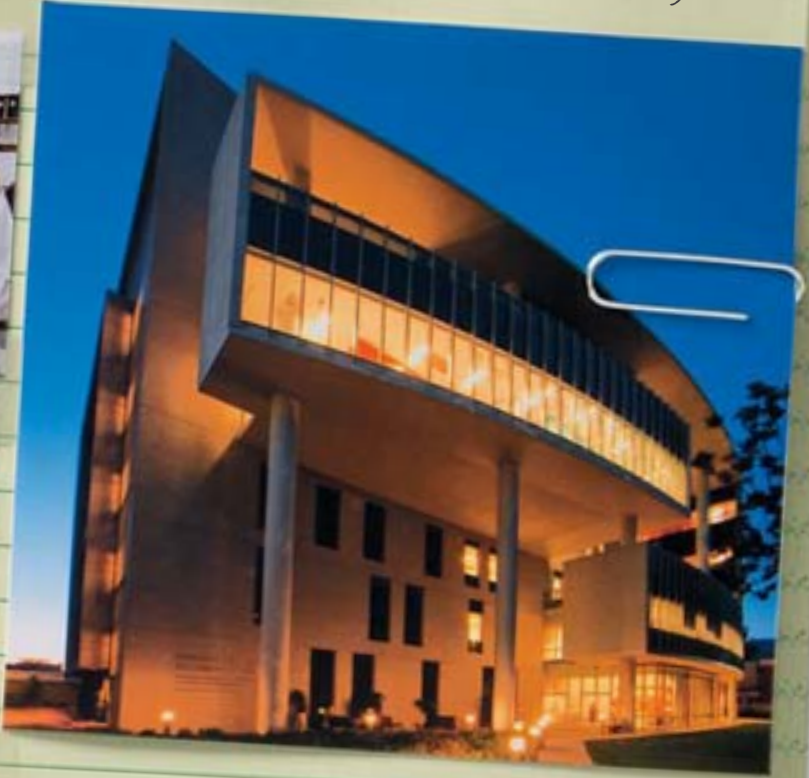
Irell & Manella Graduate School  
of Biological Sciences

Founded in 1994, the Irell & Manella Graduate School of Biological Sciences trains future leaders in biomedical research. Through a rigorous curriculum leading to a Doctor of Philosophy degree in biological sciences, graduates are equipped to address fundamental questions in the life sciences and medicine. City of Hope's interdisciplinary approach provides ample interaction with peers and faculty, with a focus on translational research: applying breakthroughs in basic science to solve clinical challenges.



STUDENTS' RESEARCH OFTEN  
LEADS TO IMPORTANT  
ADVANCEMENTS IN SCIENCE





STATE-OF-THE-ART EQUIPMENT AND FACILITIES

THE GRADUATE SCHOOL IS HOUSED IN THE ARNOLD AND MABEL BECKMAN CENTER FOR CANCER IMMUNOTHERAPEUTICS & TUMOR IMMUNOLOGY

14 STUDENTS FROM FOURTEEN COUNTRIES

70 PH.D.S GRANTED PER YEAR.

2 LABORATORY ROTATIONS

STUDENTS EXPERIENCE A RANGE OF LABS BEFORE CHOOSING THEIR THESIS WORK.

	Fall Semester	Winter Semester	Spring Semester	Summer Semester
Year 1	Biochem/MolBiol/Genetics	Biostatistics/Bioinformatics Cell Biology	Current Topics in Biology	
	Rotation 1	Rotation 2		
	Leading-edge Lecture (two per year in the first year)			Qual. Exam part 1 — Research Proposal due end of September
Year 2	Advanced Topics Class		Scientific Writing	
	Journal Club			
	Leading-edge Lecture (six per year)			Qual. Exam part 2 — Thesis Proposal due end of June
Year 3	Advanced Topics Class			
	Journal Club			
	Leading-edge Lecture (six per year)			Yearly Dissertation Committee meeting
Year 4	Journal Club			
	Leading-edge Lecture (six per year)			Yearly Dissertation Committee meeting
Year 5	Journal Club			
	Leading-edge Lecture (six per year)			Dissertation Defense

## GRADUATE STUDIES

Students come from across the U.S., Canada, Argentina, India, Iran, Korea, China, France, Russia, Malaysia, Taiwan and other countries. Their diverse interests, backgrounds and nationalities add a depth of perspective that enriches the program.

These bright young scientists are unafraid to ask questions. **They are encouraged to try new approaches that could lead to important discoveries and improve the standard of care.**

For example, the program's first graduate, Michael Lewis, Ph.D., developed a better, more stable way to attach radioactive metals to monoclonal antibodies for use in imaging, treatment planning and therapy. This breakthrough has advanced the treatment of patients with metastatic cancers including colon and breast tumors. Lewis is now an associate professor at the University of Missouri.

Graduate students also act as vital engines of scientific progress. Their drive, time and energy can increase their laboratory's productivity. **Graduate students extend City of Hope's reach by taking on research that complements and expands on the work of senior investigators.**

City of Hope supporters understand the importance of scientific education. In 2010, Kevin and Mary Ellen Kelley, in conjunction with the insurance firm Ironshore, established the Robert Clements Graduate Student Fellowship. Kevin Kelley is chief executive officer of Ironshore. The fellowship is named after the firm's founder, Robert Clements, a leader in the insurance industry.

The graduate school itself is named after the legal firm Irell & Manella to acknowledge a significant financial gift made to City of Hope in 2009. The firm previously established a symposium and lecture fund and provided support for the graduate school's endowment.



*"I like the fact that we are so involved in translational research — that what we do in the lab today can help people in the future. I attend our monthly breast cancer meetings to see how our work is benefiting patients, because that's ultimately the goal."*

Karineh Petrossian, graduate school student