

THE MENTOR MODERL

PHD PROGRAMS IN THE BASIC SCIENCES ARE THRIVING



SMALL

O'BRIAN

PHOTO BY DOUGLAS LEVERIE

In 1997, the School of Medicine and Biomedical Sciences shifted graduate education out of the medical curriculum for the first time in its history. The ambitious initiative, known as the Interdisciplinary Graduate Program in Biomedical Sciences (IGPBS), resulted in a new curriculum and a lab rotation system designed to cultivate fruitful collaborations between future research scientists and principal investigators.

Thirteen years later, the 12-month program that serves as a portal to PhD studies continues to thrive. In the 2009-2010 academic year, the IGPBS class was the largest ever.

"The IGPBS gives students the opportunity to explore," says Kenneth M. Blumenthal, PhD, senior associate dean for research and graduate education and chair of biochemistry. "Before they choose a life's work, they experience aspects of research or science that they may not have been exposed to as undergraduates."

The disciplines represented in the IGPBS translate to a wealth of choices for students. Even those who enter the program committed to a specific department have been known to change their mind once they discover the options available to them, according to IGPBS administrators.

"Before coming here, students have often worked in one lab, doing one very narrow thing, and they think that's what they want to do. But when they see the breadth of research going on here, it opens their eyes to all of the different possibilities," says Laurie K. Read, PhD, director of the IGPBS.

Throughout the year, students rotate in three to four labs, which they rank at the end of their IGPBS studies. They are then

BY NICOLE PERADOTTO

matched with a mentor, launching them into their PhD research.

"The reason for the lab rotations comes back to flexibility," explains Terry D. Connell,

PhD, director of admissions and recruitment. "It's scary for a student to think about going into a program and having to pick a mentor right off the bat because they're going to be with that person for four or five years. So the idea of being able to 'shop around' is enticing to them."

Thanks to the lab rotation system, success stories are being written every day in biomedical research labs throughout UB. Here, we highlight four of them, as told to us by PhD candidates and the scientists who mentor them.

SANDRA SMALL AND MARK O'BRIAN

BIOCHEMISTRY

When she entered the IGPBS, Sandra Small was determined to become a microbiologist.

Today, she's working toward her doctorate—in biochemistry.

"That's the beauty of the program," Small says. "I didn't come in with a lot of research experience, knowing exactly what these fields are about. I had to branch out, and I learned that there are other fields that are as interesting as micro and immunology."

According to Small's mentor, the lab rotations are pivotal in that they help students chart the direction of their doctoral research.

"There are a lot of intangibles that make a research program appeal to a particular person," says Mark O'Brian, PhD, professor of biochemistry and microbiology. "Many students who come in thinking they know what they want to do change their mind. A lot of reasons—scientific and interpersonal—go into that decision."

Small says she chose UB for the sense of community she noticed during recruitment weekend. "UB has a much more cooperative research environment than some of the schools I looked at."

She chose O'Brian's lab, in part, for the same reason.

"You have to be able to approach your mentor with problems and ideas," she says. "Mark lets you have your independence. He's not standing over your shoulder constantly asking, 'Where's the data?' He lets you motivate yourself, but he's there to help if you need it."

And asking for help is important because, within their respective labs, UB students are given great responsibility.

"Graduate students are an integral part of the research programs within the medical school," O'Brian says. "They're not in the margins. We need them, so their success is our success."

KEVIN MAHARAJ AND DAN GEWIRTH

STRUCTURAL BIOLOGY

As a graduate student, Kevin Maharaj admits that he can be lured almost anywhere with the promise of free food.

In 2006, it was the aroma of pizza—topped with Maharaj's interest in molecular chaperoning—that drew him to an informational luncheon for IGPBS students hosted by the structural and computational biology department.

The first to arrive, Maharaj still hasn't left. Four years later, he's completing doctoral research on molecular chaperones that play a role in tumor progression.

"I didn't know about structural biology before I came here," says the New York City native, "but during the lab rotations it became my clear-cut first choice."

Working in Hauptman-Woodward Medical Research Institute in Buffalo, Maharaj is mentored by Daniel Gewirth, PhD, senior research scientist and associate professor of structural biology.

"I try to impress on students that it's much better to join a lab where you enjoy

the work and get along with the mentor rather than to join a lab for prestige," Gewirth says. "There's nothing wrong with having stars in your eyes, but the key is to like what you're doing and who you're working with."

Maharaj clearly enjoys both. Under Gewirth's guidance he has used cutting-edge research techniques, presented posters at international conferences and received a highly competitive fellowship from the National Institutes of Health. What's more, he's learned a valuable lesson in pacing himself.

"When I first started in the lab, I was so gung-ho that I was showing up at 5 a.m. to do protein preps. Dan said to me, 'Kevin, it's a marathon—not a sprint! That's something I'll always remember."

"Research is a lot of highs and lows. You have to keep an even keel because you're not always going to get the results you want. Dan helps me maintain that even keel."

LOUKIA KARACOSTA AND ARTHUR EDELMAN

PHARMACOLOGY AND TOXICOLOGY

Loukia Karacosta traveled 5,000 miles to study in the IGPBS. It was, she says, one of the best moves she's made.

That's because Karacosta, a dual citizen of the United States and Cyprus, is realizing her professional dream at UB: studying cancer in collaboration with one of the world's premier cancer research centers.

"I decided to attend UB for two reasons: one, its connection to Roswell Park Cancer Institute," says Karacosta. "Two, I wanted to give myself a chance to learn about other fields besides cancer research. You're more whole as a scientist if you're exposed to other techniques and fields."

Working with Arthur Edelman, associate professor of pharmacology and toxicology, Karacosta is researching the role of protein kinases in prostate cancer. She was introduced to Edelman's lab at a poster presentation during her first semester in the IGPBS.

"Loukia struck me because she had a very clear focus of what she wanted to do," Edelman says. "We were working on basic cell biology in my lab, and we wanted to expand the research to a more translational level. But we needed the right person to push the project. Loukia did that, and it's opened up a whole new realm of possibilities."

The project is divided between Edelman's lab and Roswell Park, where the clinical research takes place. Karacosta is comfortable working in both settings because she had a chance to explore each during her lab rotations.

"I am totally devoted to research," she says. "I can't see myself doing anything else. I'm collaborating with very important people in the field. I feel like I am doing something important in the area of cancer and some very basic, very good research."

EMILY CLEMENTI & ANDERS HAKANSSON

MICROBIOLOGY AND IMMUNOLOGY

When Emily Clementi began exploring PhD programs, she knew what she was looking for.

"I wanted to go to the school that had the most people I could envision working with," says the Pennsylvania native. "That was definitely UB. There is a wide variety of faculty here doing research in my area of interest—bacterial pathogenesis—compared to the other schools I was considering."

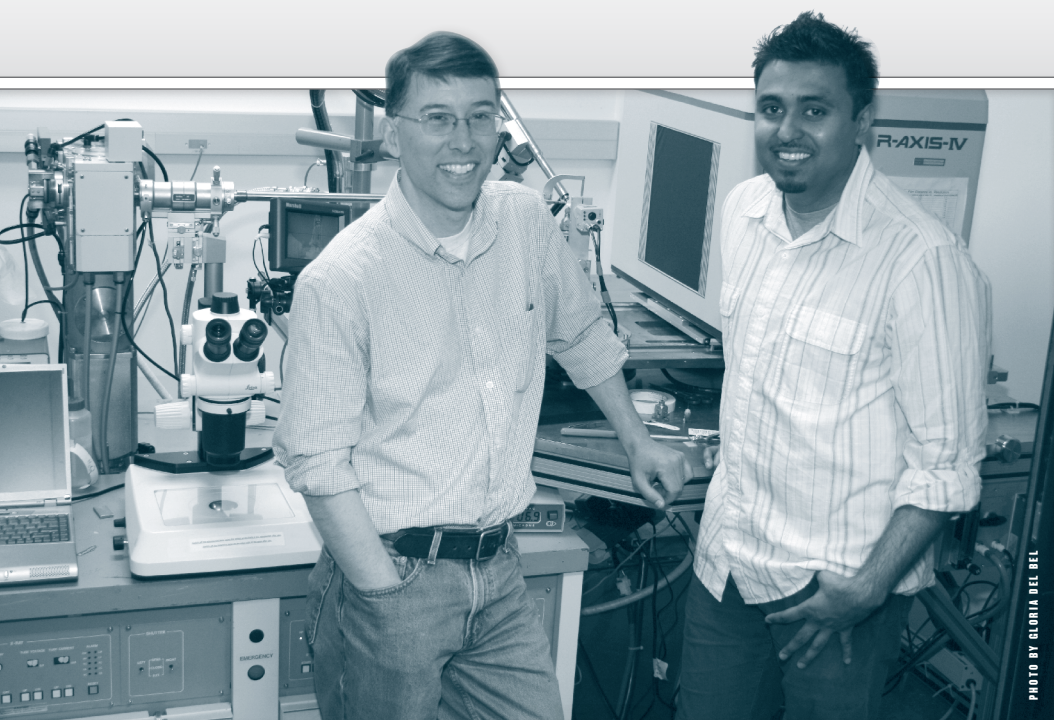
What Clementi didn't know when she enrolled in the IGPBS was that a research scientist studying the pathogenic bacterium that most intrigued her had just joined UB's faculty.

The pathogen is *Streptococcus pneumoniae*, a leading cause of morbidity and mortality from respiratory tract and invasive infections worldwide. The investigator is Anders Hakansson, PhD, assistant professor of microbiology and immunology.

"As a mentor, I need people to be enthusiastic about coming to work here," Hakansson says. "I want people with passion, and that is quite easy to get a feel for if you work with them during a lab rotation."

Clementi is researching how a protein found in human breast milk kills bacteria responsible for respiratory tract infections. Thanks to a travel grant from the American Society for Microbiology, she recently presented her research at their 109th general meeting.

"Students looking for a lab try to pick out the best combination of qualities," says Clementi. "For me, everything was right. I like the people in the lab, I like my mentor and, of course, I like my project a lot. I'm very lucky."



GEWIRTH

MAHARAJ



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