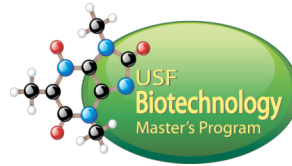


USF Biotechnology Master's Program prepares graduates qualified for Florida's growing biotech industry

Workforce needed to apply promising new technologies to real world



Students in the USF Biotechnology Master's Program tour Moffitt's Microarray Core Laboratory

As the pace of technology quickens, the demand for highly skilled biotechnology professionals who can meet the demands of business and industry continues to grow. The U.S. Department of Labor reports that 100,000 new jobs in biotechnology were added in the last five years.

At USF, a master's program started last year is preparing students for careers as scientists, managers, consultants and other positions in the burgeoning field of biotechnology.

The USF Biotechnology Master's Program places a strong emphasis on practical and networking experience. It is the newest of three university-wide master's degrees offered by the university's College of Medicine. The other two, begun in 2003, are the master's programs in Bioinformatics & Computational Biology and in Bioethics & Medical Humanities.

Crossing traditional disciplines

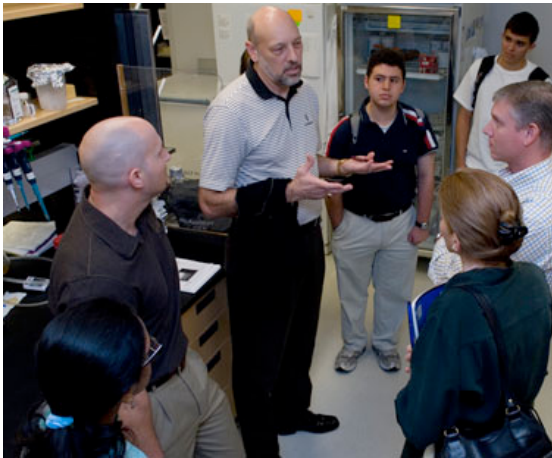
While administered by the medical school, the Biotechnology Master's Program emphasizes an interdisciplinary curriculum taught by faculty from the Colleges of Medicine, Engineering, Public Health, Arts and Sciences and Business Administration. That's because biotechnology crosses the traditional disciplines of biological, chemical, engineering, health and computer sciences, and the strong commercial aspect of the field requires a solid foundation in business and regulatory practices, said Inge Wefes, PhD, director of the Biotechnology Master's Program.



Biotechnology involves applying the new technologies generated by biological, biomedical and engineering research into drugs devices and services said Dr. Wefes, an assistant professor of molecular medicine. A few examples include the alteration of genes within cells to treat or cure disease, designing organisms to produce antibiotics, harnessing bacteria to turn waste into harmless byproducts, and the use of genetic engineering to increase crop yield and resistance to disease.

“Our master’s degree fills a niche for those students who may not want or be able to commit five years to obtaining a PhD degree,” Dr. Wefes said. “It gives them a broad knowledge of biotechnology, which they can be trained to apply to a company’s specific needs.”

The 36-credit-hour course can be completed within three semesters if students attend full time. In addition to core courses that provide an overview of biochemistry, molecular biology, bioinformatics, biotechnology, and the bioethics, business and legal aspects of biotechnology, a graduate seminar exposes students to the latest biotech topics, such as nanobiotechnology, gene therapy and stem cells innovations. Through a series of electives in four categories -- science, engineering, public health and business/law -- students can tailor the graduate program to meet their diverse career needs and interests.



Stever Enkemann, PhD (center), director of the Microarray Core Laboratory at Moffitt Cancer Center, says his biotech job requires an understanding of molecular biology, computer and statistical skills, and creativity.

Bridging academics and business

Outside class, they work on team projects that, for example, may investigate the advances and challenges of personalized medicine – customizing treatment to an individual patient’s genetic profile. Students learn about the licensing, patent protection and new venture formation processes vital to biotechnology innovation. A key requirement of the program is 140-hour-minimum internship that helps bridge the gap between academics and business. They have an opportunity to work in institutions involved in translational research and pharmaceutical and medical device companies across Florida.

“We get them out of the Ivory Tower mindset and into the business and industry environment,” Dr. Wefes said. “The internship helps our students gain real-world experience that makes them more marketable in the biotechnology workforce.”

James Boyas, an account executive for KForce Scientific, a professional staffing firm, said the biotech industry in Central Florida is steadily increasing, and companies prefer to recruit qualified employees locally rather than go through the expense of hiring and relocating incumbents from outside the region or state.

“The USF Master’s Program in Biotechnology provides a thorough cross-section of knowledge that definitely gives students an edge in getting their foot in the door,” said Boyas, who sits on the membership committee for BioFlorida, the statewide bioscience industry association. “A majority of hiring managers are looking, not necessarily for PhDs, but for mid-level candidates with professional maturity, who also have some relevant exposure to their industry, whether it’s biomedical, environmental, agricultural, industrial, clinical or pharmaceutical.”

Elise Dantuma, 24, and Srikanthi Saladi, 27, are among the students enrolled in the pilot class of the USF Biotechnology Master’s Program. They began the program in Fall 2007 and expect to graduate later this year.

Saladi, 27, is combining her interest in biotechnology research with her background in clinical dentistry. She practiced as a dentist and held a faculty appointment at Gitam Dental College in Vizag, India, before moving to Tampa in 2006. She wants to help introduce new products and technology into the dental profession to improve oral health and advance maxillofacial surgery. For example, she said, biodontics is a new area of biotech research using stem cells to restore and replace teeth and underlying bone. Dentistry has also begun to tap into nanobiotechnology, Saladi said, investigating the use of “dentirobots” -- miniscule therapeutic particles delivered by toothpaste or mouthwash -- to seek and destroy the plaque that leads to tooth decay and gum disease.



Graduate student Srikanthi Saladi plans to combine biotechnology research with her expertise in clinical dentistry.

Dantuma, who earned a bachelor’s degree in biology from the University of Central Florida, enjoys the business aspects of biotechnology. Her goal is to eventually start her own biotechnology company or become the CEO of one. “I’d like to manage a medical devices lab, and then eventually the company that develops medical devices to be used for personalized medicine, like genetic profiling chips,” she said. “I’m eager to get out into the field and see how biotech businesses and commercial laboratories operate on a daily basis.”

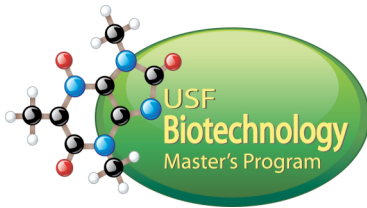
Experiencing translational research in action

As part of the program, the students have been visiting various nonprofit and for-profit biotechnology sites across the Tampa Bay area. Recently, students toured the Microarray Core Laboratory at Moffitt Cancer Center, where cancer researchers are analyzing and profiling the molecular properties of tumors with the aim of determining which drug or drugs are most effective against which tumor.



“I think biotechnology is where the field of computers was 10 or 20 years ago,” Saladi said. “No one today can envision life before computers, yet the Internet and globalization that resulted from the computer revolution weren’t talked about even a decade ago ... Biotechnology offers so many exciting possibilities – the potential to revolutionize health care, environmental protection and agriculture.”

For more information on the USF Biotechnology Master’s Program, visit www.biotech.health.usf.edu or contact biotech@health.usf.edu.



L to R: Inge Wefes, PhD, director of the USF College of Medicine’s Master’s Biotechnology Program, with Srikanthi Saladi and Elise Dantuma, two students enrolled in the program. Saladi holds a DNA microarray, commonly known as a gene chip.



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March 2008*