

Biotech Student Explores Interest in Biotechnology

By Jennifer Blank

BIOTECHNOLOGY STUDENT

Biotechnology is one of the fastest growing career paths and represents the wave of the future in many fields. The biotechnology program at CCAC, Boyce Campus, conducted by Dr. Leelavati R. Murthy, offers students a great foundation from which they can launch their career.

Students of biotechnology participate in many hands-on programs including exposure to real-life applications. A biotechnology degree can be applied in a variety of fields ranging from information systems technology to agriculture and medicine. New breakthroughs are emerging at an exponential rate.

CCAC is one of the few schools in the region to offer coursework in biotechnology. Murthy, Boyce's biotechnology program director and associate professor, encourages students to enroll in the introductory course "Surveys of Biotechnology."

Murthy is available to speak with all prospective biotechnology students regarding the program. CCAC is proud to offer a degree program in biotechnology where graduates can begin their career following graduation or continue on to further their education.

Within Western Pennsylvania, students will find a broad range of opportunities to apply their newly acquired biotechnology skills.

CCAC's biotechnology stu-

dents are exposed to many hands on experiences. On campus, students can expect exposure in a lab setting to various equipments and techniques used in biotechnology applications.

Murthy provides exhibits in class including DNA fingerprinting as used by forensic detectives and cultures of protein producing bacteria containing altered plasmid DNA.

Off-campus field trips allow biotechnology students to visit working biotechnology labs at Carnegie Mellon University (CMU) and Pittsburgh Tissue Engineering Initiative (PTEI).

Paid summer internships are available through both CMU and PTEI and all of Murthy's students are encouraged to apply.

Murthy's students in her Survey of Biotechnology class, during the spring 2005 semester, visited the biotechnology polymer chemical lab of Dr. Mary K Rabinowitz of Pittsburgh Tissue Engineering Initiative (PTEI) at CMU during a field trip.

The students were shown new technology being developed which will allow an organisms to regenerate injured tissue.

Using a scaffold of polyurethane foam containing growth cell osteoblasts and growth factor hormones, scientists are able to encourage new cellular growth in a deficient region.

Students were also able to visit the tissue culture rooms and shown examples of polymerase chain reaction and southern blotting techniques.

They were able to view equipment including: fluorescent and inverted microscopes, U.V. stratalinker, flourometer, isotemp oven, U.V. light camera, autoclave, vacufuge and centrifuge.

Some of the most remarkable research in medical biotechnology

is taking place here in Pittsburgh at the PTEI and McGowan Institute for Regenerative Medicine involving tissue engineering, cellular therapies, medical devices and artificial organs.

In PTEI's wound healing lab, scientists are developing ways to replace tissue in organisms using the extra cellular matrix (ECM) harvested from pig intestine.

The ECM has already been used in a variety of clinical trials. During one such application, the ECM was molded into a dorsal fin for a wounded dolphin that lost a portion of its fin in an accident.

In a relatively short period of time, the dolphin's system produced cells to cover and eventually replaced the ECM.

In human trials, ECM has been used to patch Siamese twins separated at the head and a man's gunshot wounded foot.

Other scientists at PTEI are working to make the Ventricular Assistance Device more applicable to infants during heart surgery.

In PTEI's Vascular Bioengineering Research Lab, Dr. Tim Maul is working on vein replacement problems. Dr. Maul is experimenting with differing levels of stress on veins taken from the leg in hopes of determining ways to increase their flow capacity and life longevity when used in heart surgery.

Students who apply for internships with either CMU or PTEI have a broad variety of choices for summer projects. Biotechnology is very multidiscipline and students may choose to specialize in a specific field.

Summer 2006 internships through PTEI are available to undergraduates pursuing careers in fields related to tissue engineering. This year's PTEI Undergraduate Summer Internship Program (SIP) gained valuable research experi-

ence and networking opportunities.

SIP graduates presented their research projects at the end of their ten-week internship during a biotechnology symposium.

Murthy and two of her students, including myself, were able to attend this conference and gain insights into a variety of tissue-related medical therapies. Participants gave oral presentations on their summer projects.

Topics covered by PTEI/ SIP graduates included: cellular regeneration, differentiation, proliferation, and apoptosis, use of ECM, calcium aluminates, polyurethane scaffolds and stem cells in wound healing and a special set of projects conducted in conjunction with the U.S. Army Institute of Surgical Research to aid burn and amputee victims of the current war.

Biotechnology is the wave of the future, not only for medical applications, but also for many other fields.

Biotechnology is used in agriculture for producing genetically modified crops which are drought, frost and pest resistant.

Detectives conducting criminal investigations use biotechnology when DNA and other evidence must be analyzed.

Students interested in fields such as medicine, engineering, research, chemistry, physics, mathematics, computer science or other related fields can find their own niche in the biotechnology industry.

Many opportunities exist with careers available for associate degrees and up. Employers are aggressively seeking individuals for research assistants, sales associates and computer programmers.

Biotechnology has the potential to offer students bright opportunities in an ever-changing and evolving field.

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