

NANO-RAMA

Through training and education, Penn State aims to steer nanotechnology research and development toward world change for the better

A CANCER PATIENT IS INJECTED WITH A MICROSCOPIC VEHICLE that safely delivers a potent drug directly to cancer cells. A football player pulls on his lucky pair of socks, unwashed for 10 straight games, yet surprisingly odor-free. A college student eats a week-old portion of leftover sushi and does not get sick.

All of these scenarios may soon become a reality as nanotechnology—basically, the science of building objects at the nanometer scale, or 100,000 times thinner than a human hair—becomes an increasingly popular field.

“Nanotechnology is expected to play a key role in the next industrial revolution,” said Dr. Stephen Fonash, director of the new Nanotechnology Applications and Career Knowledge (NACK) Center at Penn State.

NACK, funded in September 2008 with a grant from the National Science Foundation (NSF), supports the development of two-year nanotech degree programs across the country; offers professional development programs for secondary teachers to become nano-literate; and develops and delivers worker education programs.

In Pennsylvania, more than 500 students from partner community and technical colleges have completed nanotechnology programs at Penn State, and nearly all of them have found nanotechnology jobs in more than 90 firms, ranging from pharmaceutical to photovoltaics companies.

“Not only students but also industry personnel must have a better understanding of nanotechnology and its



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far-reaching implications if they hope to take advantage of the competitive opportunities becoming available,” added Fonash.

To Market, To Market

It’s the ethical implications of nanotechnology that led Penn State faculty Drs. Richard Doyle (English), Mark Horn (engineering science and mechanics) and Richard Devon (engineering design) to develop and deliver an NSF-sponsored undergraduate course in which students explore how nanotechnology is researched, designed and commercialized. Students in the class work in teams and collaborate with nanotech researchers to create scenarios for design commercialization and social impact.

Although nanotechnology is radically transforming our lives in wonderful ways, some health and safety analysts worry about how nanoparticles will behave in our bodies and in the environment. “We need to think systemically about how these technologies will alter our lives,” said Doyle.

This fall, Doyle, Horn and Devon are hosting what they refer to as a “town hall on nano” with students who took the class last spring, plus interested researchers and members of the community, to discuss nano research and how it might affect people and the environment.

“It is important that not only students learn about these technologies, but also that researchers and policy-makers learn from the collective deliberations of students focusing their attention on this burgeoning field,” said Doyle. The students’ scenarios will be shared with researchers in ongoing Wikibooks on nanotechnology.

WHAT’S NEW ONLINE: MASTER OF PROFESSIONAL STUDIES IN INFORMATION SCIENCES

A NEW ONLINE MASTER’S DEGREE in information sciences aims to give professionals the skills to not only use the foundations of information sciences and technology, but also to apply them in a real-world context.

John Van Vactor, director of online education in the College of Information Sciences and Technology, gives as an example the challenges of protecting a computer system. “If a person shares a

computer system password, then that person has circumvented the technology side of information security. Once that information is shared, there isn’t anything that can be done from a technology standpoint to correct it,” he said. “This new program will help students ... deal with those information-centric challenges.”

Offered by the college through Penn State World Campus, a unit of Outreach, the program admitted its first students this fall.