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# Penn tries to dispel myths about nanotechnology

Thursday, October 20, 2005

By EILEEN STILWELL  
Courier-Post Staff

PHILADELPHIA

The University of Pennsylvania aims to be on the cutting edge of nanotechnology, a far-reaching science with endless applications; but it also wants to head off the kind of backlash that has hampered progress in other hot-button topics like stem-cell research and genetically engineered foods.

The answer is to educate, dispel myths, tamp down the hype and poke fun at the science-fiction scenarios, the director of Penn's new Nano/Bio Interface Center said Tuesday at a seminar on the the world's smallest unit of measure.

Armed with an \$11.4 million grant from the National Science Foundation to study potential applications of nanotechnology to molecular biology, Penn is reaching out to explain the beginnings of a science that "will be the driver of this century," said Dawn Bonnell, an engineering professor at the university and director of the center.

First a definition: As a prefix, "nano" means one billionth. A nanosecond is one billionth of a second. A nanometer is one billionth of a meter or the width of a single strand of DNA (half of a double-helix). A six-foot man is 1.6 meters or two billion nanometers tall and a single dust mite -- invisible to the naked eye -- is three nanometers wide.

Nanotechnology could be applied to a multitude of sciences from material creation to medicine.

The key is to observe and manipulate single molecules and ultimately to build tiny machines capable of entering humans for health purposes or to be used covertly in surveillance and warfare.

For example, cameras the size of pills could be swallowed and allowed to swim through a patient's gastrointestinal track, taking pictures, pumping dye or even dispensing drugs. That application, said Bonnell, is in clinical trials.

Nanosensors capable of detecting contaminants on the order of one part per million in the air and water would have enormous public health applications.

Books by popular author Michael Critchton and consumer products, such as stain-repellent materials, that are being widely touted as the latest in nanotechnology, are making the science a household word.

At Penn, 20 professors from 10 departments in the schools of engineering, arts and sciences and medicine are collaborating on the subject.

Experts trace the beginning of the field to the late 1980s when the ability to scan and manipulate molecules came with the invention of a scanning tunneling microscope in IBM's Zurich, Switzerland, laboratory.

Interest at the federal level is evidenced by a \$1 billion appropriation for nanotechnology research last year. Within 10 years, the field is expected to generate two million new jobs.

"Nanotechnology is at the stage now that computer technology was in the 1950s. In time I believe it will change the face of society," said Bonnell.

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**NANODAY AT PENN**

Where: Nano/Bio Interface Center of the University of Pennsylvania

What: A free day of lectures, tours and demonstrations for the community on nanotechnology.

Contact: James McGonigle at [jmcgon@seas.upenn.edu](mailto:jmcgon@seas.upenn.edu) or (215) 898-5151

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