

Scientists will develop medical and biological applications of ultra-small science

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Manmade molecules that deliver drugs directly to sick cells, tiny sensors that monitor oxygen levels in the bloodstream, molecular surgery to remove defective genes - it all sounds like science fiction. But the basic technology to make these advances possible is being developed now by scientists working in different academic units and research centers throughout the University of Michigan.

To support and expand these research initiatives, Robert Kelch, M.D., U-M executive vice president for medical affairs, announced today the creation of the Michigan Nanotechnology Institute for Medicine and the Biological Sciences.

Nanotechnology is the science of the ultra-small. One nanometer equals one-billionth of a meter, which means it would take 100,000 nanometers lined up side-by-side to equal the diameter of a human hair.

The institute will merge academic expertise and institutional resources across the university to develop and market applications for nanotechnology in medicine, the biological sciences and the environment. The U-M Board of Regents approved the new institute at its monthly meeting on April 21, 2005.

“This new institute will put us on the national map in the development of core nanotechnologies for the life sciences,” says U-M President Mary Sue Coleman, Ph.D. “Nanotechnology is a key component in the National Institutes of Health ‘roadmap’ for future investment, and we are

creating a strategic alignment of U-M's nanoscientists as we strive to expand our research activities in this arena.”

James R. Baker Jr., M.D., the Ruth Dow Doan Professor of Biologic Nanotechnology, will serve as the institute's first director. A pioneer in the emerging field of nanomedicine, Baker holds dual appointments as a professor of internal medicine in the Medical School and a professor of biomedical engineering in the College of Engineering. He is the current director of the U-M Center for Biologic Nanotechnology, which will be integrated into the new institute.

“Jim Baker has the perfect combination of technical expertise, medical experience and management skill to lead this important initiative,” says Kelch. “Our goal is to develop new nanotechnology-based therapies, conduct clinical trials, and make these treatments available as quickly as possible to patients who need them.”

“Nanotechnology is changing how scientists work by giving them the ability to manipulate individual atoms and molecules in biological systems,” says Baker. “Its potential to provide innovative solutions to problems in biology, medicine and the environment is unlimited. But to reach that potential, we need to draw on the knowledge and experience of U-M researchers and technical experts working in a wide range of physical and biological sciences, as well as in materials research and biomedical engineering.”

According to Allen S. Lichter, M.D., dean of the U-M Medical School, the university has unique resources to help nanotechnology-based medical therapies reach their full potential.

“Funded by the National Institutes of Health, the U-M's General Clinical Research Center provides essential medical services for research subjects participating in U-M clinical trials,” Lichter says. “Our Human

Applications Laboratory is approved by the Food and Drug Administration to produce gene, cell and tissue-based therapies. Access to these facilities will help move nanotechnology from the laboratory to the clinic as rapidly as possible.”

Educating the next generation of nanotechnology researchers will be a major goal of the new institute, according to Baker. “Every faculty member in the institute must agree to support every other faculty member’s students,” Baker says. “Graduate students will have seamless access to equipment and lab space, and we will rotate them through other laboratories to give them the exposure to different disciplines they need to work in this inherently multidisciplinary field.”

By making it possible for funding agencies to work through just one academic unit, instead of many schools and colleges, the new institute will facilitate external support for cross-disciplinary research in nanotechnology, according to Baker. He says plans also are underway to jump-start the creation of new spin-off companies to market technologies developed at the institute.

“We will work with representatives from the U-M’s Technology Management Office and faculty in the Stephen M. Ross School of Business to ensure that marketable technologies are transferred to the private sector as rapidly as possible in a manner that complies with university policy,” Baker says.

Source: University of Michigan

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