



UNIVERSITY OF MARYLAND
SCHOOL OF PHARMACY

CENTER FOR
NANOMEDICINE
AND CELLULAR DELIVERY



STRATEGIC GOALS

- Design, develop, and evaluate nanostructures for the delivery of therapeutic and diagnostic agents
- Facilitate the translation of promising delivery systems to clinical research
- Foster new and ongoing collaborative projects
- Recruit experts in nanomedicine research and enhance infrastructure
- Provide training in the emerging multidisciplinary field of nanomedicine

ORGANIZATION

The CNCD is organized under the Department of Pharmaceutical Sciences at the University of Maryland School of Pharmacy.

Director Peter Swaan, PhD, and Co-Director Anjan Nan, PhD, provide vision, leadership, scientific direction, and administrative oversight of the center.

The Executive Council consists of the director, co-director, and senior members of the center who assist in identifying priority research themes and funding opportunities. The council promotes interactions between CNCD members and beyond to encourage goal attainment in the priority research areas.

The Advisory Board advises the center's membership on scientific and administrative issues. The board consists of scientists and administrative leaders external to the center membership who are leaders in the field of drug delivery, nanotechnology, and translational research, or who serve in key administrative positions in the University System of Maryland, to facilitate collaborative research. The board will review the annual report of the center and provide advice and counsel for future center activities.

RESEARCH

Successful research and development in nanomedicine requires the interaction of a multitude of disciplines, including material science and engineering, cellular biology, and clinical translational research. The CNCD brings—to one platform—several key areas of research related to nanotechnology and drug delivery, and their translation into clinical research, with exciting new emerging directions that are developing rapidly through involvement of multidisciplinary research teams:

Nanofabrication and Characterization

- Nanotubes
- Nanoparticles
- Nanocomposites
- Colloids
- Polymers

Delivery of Bioactive Agents

- Targeted delivery to solid tumors
- Targeting tumor angiogenesis
- Drug delivery with microfabricated devices
- Recombinant polymers for cancer gene therapy
- Dendrimers for oral drug delivery
- Delivery of radionuclides and contrast agents

Pharmacokinetics, Transport, and Subcellular Fate

- Biopharmaceutics and pharmacokinetics
- Transport across epithelial barriers
- Transport across the blood-brain barrier
- Mucosal biology research
- Membrane transporters
- Cell proliferation, growth regulation, and apoptosis

Translational Research

- Preclinical studies
- Diagnostic radiology
- Clinical trials

Computer-Assisted Drug Design

Formulation and Drug Development

Our Vision:

We improve health by enhancing the efficacy and safety of new and existing therapeutic and diagnostic agents through the discovery and application of innovative nanosystems and devices.

PARTNERS/COLLABORATION

The CNCD is led by the University of Maryland School of Pharmacy and includes collaborators from other professional schools on the University of Maryland, Baltimore (UMB) campus, including the School of Medicine, the Dental School, and the University of Maryland Marlene and Stewart Greenebaum Cancer Center at the University of Maryland Medical Center, as well as the College of Chemical and Life Sciences and the School of Engineering at the University of Maryland, College Park. The core activities of the CNCD occur in the School of Pharmacy labs in the Health Sciences Facility II on the UMB campus.

CONTACT INFORMATION

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Our Mission:

We create a multidisciplinary research environment that provides expertise and fosters collaborations for the design, development, and use of nanosystems for therapeutic and diagnostic purposes.

The convergence of recent advances in nanotechnology with modern biology and medicine has created the new research domain of *nanobiotechnology*. The use of nanobiotechnology in medicine is termed *nanomedicine*. Nanomedicine research includes the development of diagnostics for rapid monitoring, targeted cancer therapies, localized drug delivery, improved cell material interactions, scaffolds for tissue engineering, and gene delivery systems.

The Center for Nanomedicine and Cellular Delivery (CNCD) is the scientific collaborative dedicated to exploring and advancing the use of nanosystems in the delivery of bioactive agents for diagnosis and therapy. Targeted delivery improves patients' lives by improving the safety and efficacy of therapeutics and diagnostics. Structures at the nanoscale (a billionth of a meter—not visible by microscopes—but larger than most drug molecules) provide a platform for localized delivery.





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