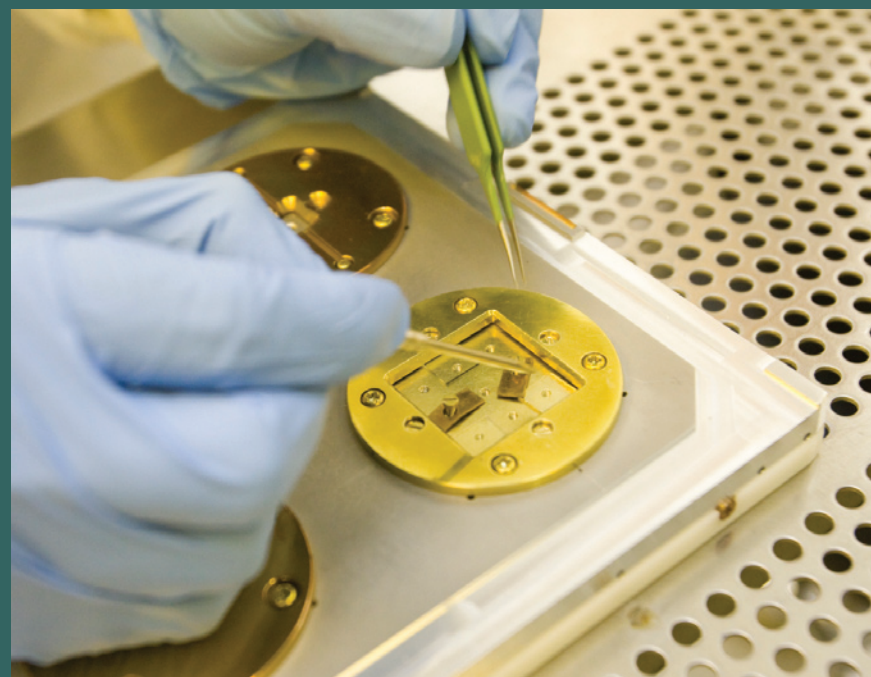
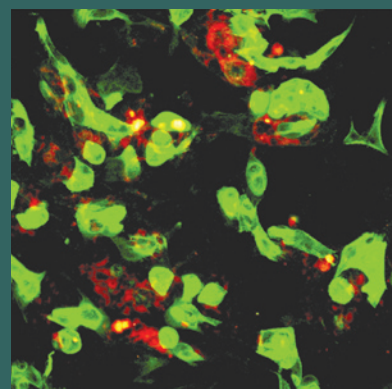


# CAPN

**By focusing at the intersection of nanotechnology, the agricultural sciences, and pharmaceutical research, our vision is to assemble a diverse and complementary set of researchers and industrial partners that are uniquely suited to address several “grand challenge” types of problems.**

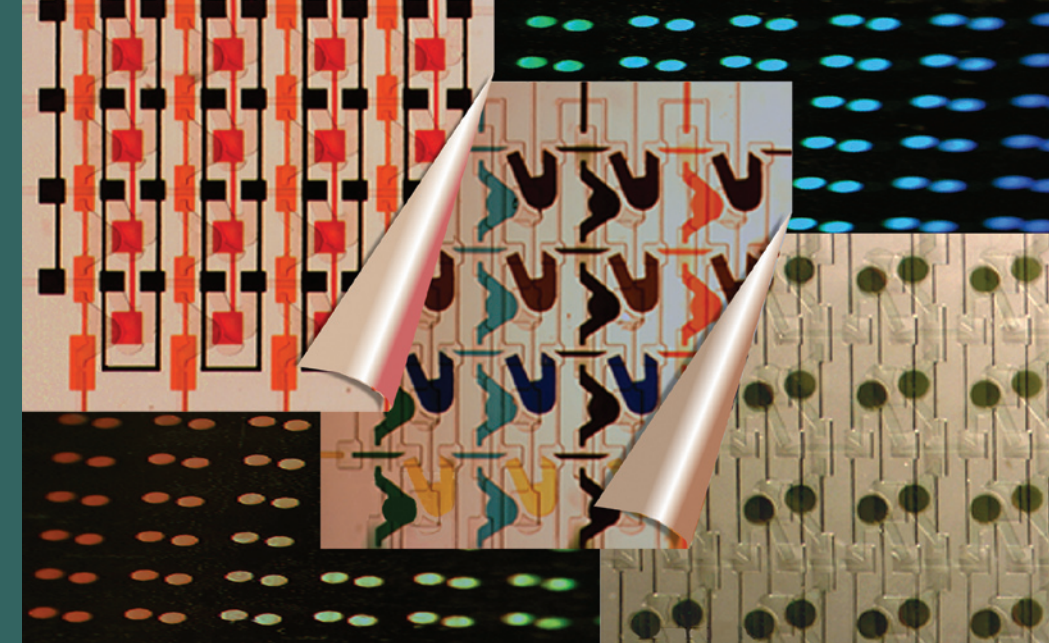


## Vision

A large fraction of the world economy is dependent upon the cultivation and processing of plants for a huge variety of uses. In addition to food products that are consumed by animals or humans, agriculture provides our society with the raw materials that are used in treatment of disease, delivery of medication, and materials used in construction, packaging, and clothing. In the past four decades, we have witnessed (and participated in) the development of a fundamental understanding of photosynthesis, and the ability to genetically engineer plants to possess commercially valuable traits. These fundamental advances in Crop Science make it clear that fundamental properties of plants are controlled at the molecular and cellular level—the realm of nanotechnology.

The ability to develop new tools, materials, and methods that enable detection, actuation, and manipulation of agricultural processes will require new collaborations that will bring crop scientists and nanotechnologists together. Nanotechnology provides an excellent opportunity to bring about scientific breakthroughs as well as tools to realize the potentials of agricultural products for quality, safety, and healthcare benefits. By focusing at the intersection of nanotechnology, the agricultural sciences, and pharmaceutical research, our vision is to assemble a diverse and complementary set of researchers and industrial partners that are uniquely suited to address several “grand challenge” types of problems in food production, agriculturally-derived materials, and health care. The confluence of these three spaces will provide a rich array of research opportunities where nanotechnology-based tools can be used for plant or human-based life science research, plant-derived materials can be engineered at the nanometer scale for disease treatment, and the tools/methods of chemistry can be applied to confer desired functions to nanostructures. The framework in which the flow of basic science and applications among each of the three technical areas (i.e. nanotechnology-based tools providing benefits to Crop Science research in one project, while in another project engineered plant-based materials provide possibilities for new pharmaceutical products) will provide a cross-disciplinary and translational research environment that will attract top researchers and active industrial participation to the Center, while at the same time it will represent a broad research space that can sustain the Center with new ideas for many years. The flow of technology benefits among the three main technical community pillars can provide a rich research environment for participating academic institutions that will help solve problems facing participating industrial institutions.

[www.cnst.illinois/capn.htm](http://www.cnst.illinois/capn.htm)



## Center for Agricultural and Pharmaceutical Nanotechnology (CAPN) Initial Planning Workshop

**NSF Industry/University Cooperative Research Center**

**August 31–September 1, 2009**

University of Illinois at Urbana-Champaign  
Micro and Nanotechnology Laboratory (MNTL)  
208 North Wright Street, Urbana, IL 61801

**CO-SPONSORED BY:**

**University of Illinois Center for Nanoscale Science and Technology**

*Colleges of Engineering, and Agricultural, Consumer, and Environmental Sciences (ACES)*



**PURDUE**  
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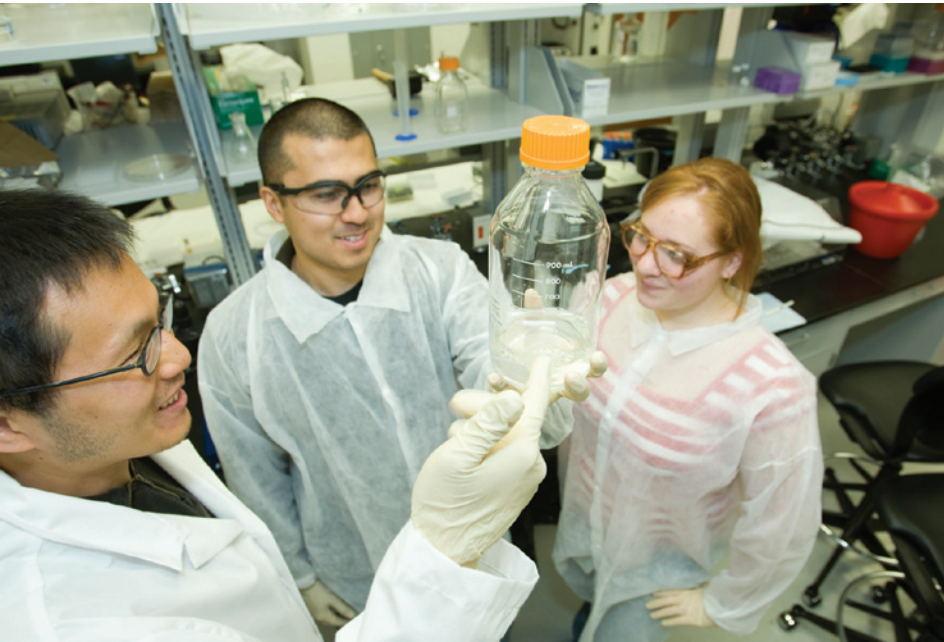
Monday, August 31, 2009

7:00-7:50 AM	Registration and Breakfast
8:00-10:15 AM	Plenary Session
8:00	<b>Workshop Overview and Welcome Remarks</b> Session Chairs: Jozef Kokini, Associate Dean Research, ACES and Rashid Bashir, Director, MNTL Prof. Ilesanmi Adesida, Dean, College of Engineering, Illinois Prof. Robert Hauser, Interim Dean, College of Agricultural, Consumer, and Environmental Sciences, Illinois Prof. Marshall Martin, Assistant Dean, College of Agriculture, Purdue Dr. Irfan Ahmad, Associate Director, Center for Nanoscale Science and Technology, and Ag and Bio Engineering, Illinois
8:20	Dr. Hongda Chen, United States Department of Agriculture <i>Visions and Actions—USDA/CSREES Perspectives on Nanotechnology for Agriculture and Food Systems</i>
8:35	Dr. Wendy Sanhai, Food and Drug Administration <i>Perspectives on Nanotechnology for Biomedical Applications</i>
8:50	<b>Vision and Capabilities of the Center</b> Prof. Brian T. Cunningham, co-PI, Illinois Prof. Richard H. Linton, co-PI, Purdue
9:30	<b>NSF I/UCRC presentation</b> Dr. Rathindra (Babu) DasGupta, NSF I/UCRC Program Director
10:15	<b>Break</b>
10:30–11:30 AM	<b>Session I: Project Presentations—NANOTECHNOLOGY</b> Session Chairs: Placid Ferreira, Nano-CEMMS, and MechSE, and Lisa Mauer, Purdue
10:30	Rashid Bashir, Illinois <i>Microfluidic Biochips and Integrated Systems for Rapid Detection of Foodborne Pathogens</i>
10:45	Cagri Savran, Purdue <i>Immunomagnetic Diffractometry for Biomolecular Detection</i>
11:00	Jo Davisson, Purdue <i>Biomolecular Labeling and Quantification Employing SERS</i>

11:30–12:25 PM	<b>Session II: Project Presentations—AGRICULTURE</b> Session Chairs: Richard Linton, Purdue, and Elizabeth Jeffery, Illinois
11:30	Arun Bhunia, Purdue <i>Biosensor Technologies for Foodborne Pathogens and Toxins</i>
11:45	Lila Vodkin, Illinois <i>Applications of Nanotechnology to Gene Expression and Plant Genomics</i>
12:00	Lisa Mauer, Purdue <i>Improved Delivery of Bioactive Ingredients</i> Discussion
12:30–1:30 PM	<b>Box Lunch and Poster Session</b> Session Chairs: Kaustubh Bhalerao, Illinois and Cagri Savran, Purdue
1:30–3:00 PM	<b>Session III: Project Presentations—PHARMACEUTICAL</b> Session Chairs: Steve Sligar, Illinois; and David Nivens, Purdue
1:35	Brian Cunningham, Illinois <i>Photonic Crystal Nanostructures for Pharmaceutical Screening, Gene Expression Profiling, and Environmental Pathogen Detection</i>
1:50	Gregory Knipp, Purdue <i>Potential for Utilizing the Pig Turn to Determine the PK/PD of Substrates and Dosage Forms</i>
2:10	J.J. Cheng, Illinois <i>Development of Conjugated Nanoparticles for Drug Delivery</i>
2:25	Schuyler Korban, Illinois <i>Nano Green-Pharma</i> Discussion
3:00 – 3:15 PM	<b>Break</b>
3:15–5:00 PM	<b>Session IV: Industry Workshop, Technology Incubation Resources</b> Each company to describe areas of interest Session Chairs: Richard Linton, Purdue; Irfan Ahmad, Illinois; and Dinkar Mylaraswamy, Honeywell Discussion
4:30	Dr. Timothy Sands, Purdue The Purdue Discovery Park Concept
4:40	Laura Frerichs, Illinois Technology Incubation at the University of Illinois Research Park
4:50	Review of Day 1 and Day 2 activities Prof. Brian T. Cunningham
5:05–6:15 PM	<b>MNTL Tour, Poster Session, and Social</b> (MNTL 2nd & 3rd Floors)
6:30 PM	<b>Dinner—MNTL Atrium</b>

Tuesday, September 1, 2009

7:30-8:00 AM	Breakfast
8:00 – 9:30 AM	<b>Session V: Feedback from Industry Workshop</b> Moderated by Brian Cunningham, Illinois; Madoo Varma, Intel; and Tiffany Houchin, Elanco Outcomes: Strategic Directions and Specific Projects
9:30–9:45 AM	<b>Break</b>
9:45–11:15 AM	<b>LIFE Form Review and Discussion (NSF moderated)</b>
11:15–11:45 AM	<b>NSF Closed Session with Industry</b>
11:45–12:15 AM	<b>Summary and Closing Remarks</b>
12:20 PM	<b>Box Lunch and Adjourn</b>



OTHER CO-SPONSORS INCLUDE:

- NCI-funded Siteman Center for Cancer Nanotechnology Excellence (SCCNE), Illinois
- USAID-HEC-Pakistan-funded Nanomedicine for Cancer Research Project, Illinois
- Micro and Nanotechnology Laboratory, Illinois
- Nano-CEMMS, Illinois
- NCN/NanoHub, Illinois-Purdue
- Birck Nanotechnology Center, Purdue
- Bindley Bioscience Center, Purdue
- Center for Food Safety Engineering, Purdue