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## **ICON Issues Survey of Nanotechnology Practices**

### *Broad-based Council Surveys Industry regarding Workplace Safety*

HOUSTON, Nov. 13, 2006 – The first comprehensive, international survey of workplace safety practices in the burgeoning nanotechnology industry finds that many nanotech companies and laboratories believe nanoparticles – specks of matter that are smaller than living cells – may pose specific environmental and health risks for workers. In response, companies are reporting that they are developing special programs and procedures for mitigating risks to workers and consumers. Yet, due in part to a lack of general information regarding nanomaterials risks, companies and labs have workers using conventional environmental, health and safety (EHS) practices when handling nanomaterials, even though the practices were developed to deal with bulk materials that can have markedly different chemical properties than their nano-sized counterparts.

"The use of conventional practices for handling nanomaterials appears to stem from a lack of information on the toxicological properties of nanomaterials, as well as nascent regulatory guidance regarding the proper environmental, health and safety practices that should be used with them," said Dr. Kristen M. Kulinowski, director of the International Council on Nanotechnology, a coalition of academic, industrial, governmental and civil society organizations that commissioned the survey.

The report, *A Survey of Current Practices in the Nanotechnology Workplace*, is available at <http://icon.rice.edu>. Both the survey and report were produced by a research team from the University of California, Santa Barbara (UCSB) that includes environmental scientists, sociologists, and corporate environmental management experts, and anthropologists.

"This is an important study because it reinforces the perspective that there needs to be more information regarding the toxicology of new nanomaterials and how they should be handled in the contexts of industry, consumers and the environment," said Dr. Patricia Holden, principal investigator (PI) for this project and associate professor in the Bren School at UC Santa Barbara where she co-advised four Master's students in this research as part of their group thesis.

“The value of this study is that we brought together knowledge of academic and industry laboratory practices, toxicologic risk assessment, and social science approaches. This allowed us to gather and analyze a unique set of detailed data from around the globe, establishing a beachhead for future studies and a first step toward developing safe handling guidelines for nanomaterials,” said Dr. Barbara Herr Harthorn, principal investigator and co-director, NSF Center for Nanotechnology in Society, UC Santa Barbara (and co-PI on the ICON study).

Survey data were collected this summer from 64 organizations in North America, the European Union, Asia and Australia. North American and Japanese respondents each represented 39 percent of those surveyed, with 17 percent from the European Union and 5 percent from Australia. About 80 percent of responses were from private-sector companies, including for-profit entities that are developing or have developed at least one product containing nanomaterials.

"The National Institute of Occupational Safety and Health (NIOSH) is pleased to see the ICON report, which we will review with great interest in our ongoing efforts to further scientific research and provide interim recommendations on safe approaches to nanotechnology," said NIOSH Director John Howard, M.D. "We appreciate UCSB's partnership, early in their process, in inviting us to participate in the planning and design of the survey. This work will give researchers a better understanding of current work practices in the nanotechnology industry, and valuable insight into current information gaps that might exist in understanding and managing the occupational health implications of this revolutionary technology."

Workers occupy the frontiers of nanotechnology development. Engineered nanomaterials are intentionally designed to take advantage of properties that emerge at the nanoscale, and nanotech workers typically face the greatest exposure risks from engineered nanomaterials. For example, in products containing nanomaterials that are incorporated in a plastic composite or other solid matrix, risks to consumers are believed to be minimal because the materials are locked up tight. But workers who make the products, and who handle the nanomaterials in raw form, face more risk of exposure.

There remains little specific information about the potential harm workers face from most engineered nanomaterials. By attempting to understand how employers and workers are currently approaching the development and implementation of workplace safety practices, ICON and UCSB are taking an important step toward the development and global adoption of best practices to minimize exposure and hazard from engineered nanomaterials.

“This report highlights some key obstacles to the responsible and successful development of nanotechnology. While a majority of companies report a lack of environmental health and safety information to guide good risk management, few companies conduct their own studies to develop this information,” said Tracy Godfrey, a project analyst with Environmental Defense. “Environmental Defense is working to address these important gaps through our efforts to increase risk research, improve government policy, and develop proactive corporate standards.”

The survey and report were part of a two-phase project aimed at determining how industry is managing the occupational safety risks that may be posed by certain nanomaterials.

"When ICON began discussing the need for best-practices guidelines for handling nanomaterials, we quickly realized there was little documentation of *existing* workplace policies and practices," Kulinowski said. "It's hard to know where you need to go if you don't know where you are. With only limited anecdotal evidence of EHS practices available, we decided that a more comprehensive evaluation was needed."

The first-phase report, *Current Knowledge and Practices regarding Environmental Health and Safety in the Nanotechnology Workplace*, was issued last month. It offered a review and analysis of existing efforts to develop "best practices" for workplace safety in the nascent nanotech industry. Today's second-phase report takes a snapshot of industry practices currently in use. Taken together, the two reports provide the first-ever overview of environmental health and safety in the nanotechnology workplace.

ICON, which commissioned the survey and worked with UCSB's team during both phases of the project, is committed to developing and communicating information regarding the potential health and environmental risks of nanotechnology and of thereby fostering risk reduction while maximizing societal benefits of the growing industry. ICON is administered by Rice University's Center for Biological and Environmental Nanotechnology (CBEN).

ICON issued a call for proposals for the study in late 2005 and awarded the grant to the UCSB team in March. UCSB's project leader is Patricia Holden, associate professor of environmental microbiology. The UCSB team includes Magali Delmas, associate professor of corporate environmental management; Richard Appelbaum, professor of sociology and global and international studies; Barbara Herr Harthorn, research anthropologist and principal investigator and co-director of UCSB's Center for Nanotechnology in Society; Bren Master's students Gina Gerritzen, Keith Killpack, Maria Mircheva and Leia Huang; Sociology Ph.D. candidate Joe Conti.

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#### **About ICON**

The International Council on Nanotechnology is a multi-stakeholder group whose mission is to assess, communicate, and reduce nanotechnology environmental and health risks while maximizing its societal benefit. Our efforts are founded on the belief that partnership activities, between governments, industry, academia and non-governmental organizations are the key to an environmentally responsible nanotechnology industry. For more information visit <http://icon.rice.edu>.

#### **About CBEN**

The Center for Biological and Environmental Nanotechnology is a National Science Foundation Nanoscale Science and Engineering Center dedicated to developing sustainable nanotechnologies that improve human health and the environment. Located at Rice University in Houston, CBEN is a leader in ensuring that nanotechnology develops responsibly and with strong public support. For more information visit <http://cben.rice.edu>.

#### **About Rice University**

Rice University is consistently ranked one of America's best teaching and research universities. It is distinguished by its: size—2,850 undergraduates and 1,950 graduate students; selectivity—10 applicants for each place in the freshman class; resources—an undergraduate student-to-faculty ratio of 6-to-1, and the fifth largest endowment per student among American universities; residential college system, which builds communities that are both close-knit and diverse; and collaborative culture, which crosses disciplines, integrates teaching and research, and intermingles undergraduate and graduate work. Rice's wooded campus is located in the nation's fourth largest city and on America's South Coast. For more information visit <http://www.rice.edu>.