Woodrow Wilson International Center for Scholars

News Release

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Important First Step to Test Nanomaterials' Toxicity

Scientists Develop Elements of a Screening Strategy to Identify Human Health Effects from Exposure to Engineered Nanomaterials

WASHINGTON – The International Life Sciences Institute will release a new report that for the first time gives scientists the *elements* of a framework for assessing the potential human health effects from exposure to engineered nanomaterials. The report will be presented at a Thursday, October 20 program held at the Woodrow Wilson International Center for Scholars by the Center's Project on Emerging Nanotechnologies.

"This report, developed by the Nanomaterial Toxicity Screening Working Group of the International Life Sciences Institute Research Foundation/Risk Science Institute (ILSI RF/RSI), is an important step in the new emerging field of nanotoxicology," according to Julie W. Fitzpatrick, ILSI staff scientist and project manager for the Working Group.

"While there is little evidence to date that nanomaterials have toxic effects, the world's scientists, industry, and governments are beginning to take a critical look at nanotechnology and to develop a research agenda for addressing key issues related to the impact of nanotechnology on health and the environment. This report is a necessary beginning to that process. It was compiled by a group of internationally recognized experts, and provides significant recommendations for developing robust and practical toxicity tests for nanomaterials," said Ms. Fitzpatrick.

Engineered nanomaterials are commonly defined as materials designed and produced to have structural features with at least one dimension of 100 nanometers (nm) or less. A human hair is roughly 100,000 nm across.

There are an estimated 700 products now on the market claiming to be made from nanomaterials, or to use or support nanotechnology—everything from cosmetics and sunscreens to bumpers on automobiles. By 2015, the National Science Foundation estimates that nanotechnology will have a $1 trillion impact on the global economy and employ 2 million workers.

Typically, nanomaterials possess special properties—chemical, optical, magnetic, biological—which make them desirable for commercial or medical applications. However, these same properties potentially may lead to a response in the human body that is different from and is not directly predicted by the constituent chemicals and compounds. For example, even a traditionally inert bulk compound, such as gold, may behave differently in the body when it is introduced as a nanomaterial.

The Working Group's report presents the *elements* of a screening strategy—rather than a detailed testing protocol—due to the limited research data currently available at this early stage in the development of a risk assessment process for nanomaterials. Based on an evaluation of these data, the Working Group considered potential effects of exposure to nanomaterials by inhalation, dermal (skin) and oral routes, recognizing that levels of exposure will be highly dependent upon how the materials are used.

The report places particular emphasis on the need to appropriately characterize or measure the properties of materials used in screening studies in order to obtain significant results. According to the report, "There is a strong likelihood that the biological activity of nanoparticles will depend on physicochemical parameters not routinely considered in toxicity screening studies."

"Toxicity studies are meaningless unless you know what you're working with," said Andrew Maynard, chief science advisor to the Project on Emerging Nanotechnologies at the Wilson Center. "The report takes a critical look at which measurements are important when examining engineered nanomaterials."

"You cannot determine risks you cannot measure," stated Dr. Maynard. "This report provides a set of tools so that as these technologies come onto the marketplace, scientists and decision-makers will be in a better position to put in place policies to safeguard the environment and health and to inform the public of any risks involved."

Günter Oberdörster from the Department of Environmental Medicine at the University of Rochester served as chair of the Working Group, which was comprised of scientists from academic, industry, and government.

The report, ***Principles for Characterizing the Potential Human Health Effects from Exposure to Nanomaterials: Elements of a Screening Strategy***, is being published by the online open access journal, ***Particle and Fibre Toxicology*** (www.particleandfibretoxicology.com).

The Working Group's report was supported by the U.S. Environmental Protection Agency Office of Pollution Prevention and Toxics.

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The **International Life Sciences Institute** is a nonprofit, worldwide foundation founded in 1978. It is internationally recognized for the quality of the research it supports and the publications it produces. The Risk Science Institute (RSI) was established in 1985 as part of the ILSI Research Foundation to improve the scientific basis of risk assessment. ILSI RF/RSI works toward this goal through an international program of scientific working groups, conferences and workshops, publications, and seminars. ILSI RF/RSI sponsors and participates in a wide range of activities to develop and disseminate new scientific knowledge, encourage exchange of ideas, and build consensus among scientists from academia, industry, government, and public interest/public health groups. ILSI RF/RSI and

its programs are supported by government grants, cooperative agreements, and contracts, as well as by contributions from the ILSI Research Foundation endowment and ILSI branches.

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