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Nanotechnology: Next Big Thing, or Much Ado About Nothing? *More Research Key to Healthy and Safe Nanotech Workers*

WASHINGTON—In less than a decade, nanotechnology is predicted to result in \$2.6 trillion in manufactured goods annually. Already, there are over 300 manufacturer-identified nanotechnology-based consumer products on the market—ranging from computer chips to automobile parts and from clothing to cosmetics and dietary supplements (see: www.nanotechproject.org/consumerproducts).

But little is known about potential risks in many areas of nanotechnology—and funding for risk-focused research is a small fraction of what is being spent on nanotechnology commercial applications. Greater resources and attention are needed now in order to ensure safe nano-workplaces today and in the future.

That is the conclusion of Project on Emerging Nanotechnologies Chief Science Advisor Andrew Maynard in a new article, “Nanotechnology: The Next Big Thing, or Much Ado about Nothing?” just released by the *Annals of Occupational Hygiene* (Oxford University Press on behalf of the British Occupational Hygiene Society). His article will appear in print in January 2007 and currently is freely available online: <http://dx.doi.org/10.1093/annhyg/mel071>

“Because nanotechnology is a way of doing or making things rather than a discrete technology, there will never be a one-solution-fits-all approach for nanotechnology and nanomaterials workplace safety,” states Maynard. “That is why the federal government needs to invest a minimum of \$100 million over two years in targeted risk research in order to begin to fill-in our occupational safety knowledge gaps and to lay a strong, science-based foundation for safe nanotechnology workplaces.”

In the short term, because of incomplete information, Maynard stresses the need to supplement good hygiene practices in the workplace with nano-specific knowledge. While initiatives such as the ORC Worldwide™ Nanotechnology Consensus Workplace Safety Guidelines, the National Institute for Occupational Safety and Health (NIOSH) “Approaches to Safe Nanotechnology,” and the International Council on Nanotechnology (ICON) “Review of Safety Practices in the Nanotechnology Industry,” provide invaluable resources for working as safely as possible with engineered nanomaterials, Maynard believes we still have a long way to go.

Until more research is available, Maynard proposes developing a “control banding” approach to nanotechnology workplace risk—a course of action that is between inaction and banning all nanomaterials as hazardous. This could involve selecting appropriate control approaches based on a nanomaterial “impact index” centered on composition-based hazard, and perturbations associated with their nanostructure—like particle size, shape, surface area and activity, and bulk-size hazard—and on an “exposure index” representing the amount of material used and its “dustiness.” “This is still very much at the conceptual stage,” says Maynard. “But unconventional problems need unconventional solutions, and these in turn will require a serious investment in relevant nanotechnology risk research.”

Andrew Maynard is an internationally recognized leader in the fields of aerosol characterization and the implications of nanotechnology to human health and the environment. Dr. Maynard joined the

National Institute for Occupational Safety and Health (NIOSH), part of the U.S. Centers for Disease Control and Prevention (CDC) in 2000.

Nanotechnology is the ability to measure, see, manipulate and manufacture things usually between 1 and 100 nanometers. A nanometer is one billionth of a meter; a human hair is roughly 100,000 nanometers wide.

The **Project on Emerging Nanotechnologies** is an initiative launched by the Woodrow Wilson International Center for Scholars and The Pew Charitable Trusts in 2005. It is dedicated to helping business, government and the public anticipate and manage possible health and environmental implications of nanotechnology. For more information about the project, log on to www.nanotechproject.org.

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