

Health and Environmental Impact of Nanotechnology

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Short Communication

The microtechnology of the second half of the 20th century has produced a technical revolution that has led to the production of computers and the Internet and taken us into a dynamic emerging era of nanotechnology. This issue of Toxicological Sciences includes two articles, "Pulmonary Toxicity of Single-Wall Carbon Nanotubes in Mice 7 and 90 Days after Intratracheal Instillation" and "Comparative Pulmonary Toxicity Assessment of Single-Wall Carbon Nanotubes in Rats" related to a newly emerging area in toxicology [1-3].

Research and technology development at the atomic, molecular, or macromolecular levels, in the length of approximately 1–100 nm range, to provide a fundamental understanding of phenomenal and materials at the nanoscale, and to produce and use structures, devices, and systems that have important properties and functions because of their small size. The novel and differentiating properties and functions are developed at a critical length scale of matter typically under 100 nm. Nanotechnology research and development mentioned integration of nanoscale structure into larger material components, systems, and architectures. Within these larger scale assemblies, the control and construction of their structures and component devices remain at the nanoscale [4,5].

At the present time products derived from emerging technologies are viewed by the public in a more demanding perspective from the standpoint of safety and environmental impact. In the case of nanotechnology, the potential for exposure to nanoparticles will increase as the quantity and types of nanoparticles used in society grow. The studies reported in this issue of Toxicological Sciences provide the first insight into the *in vivo* toxicity of a specific type of manufactured nanoparticle [6]. These studies results several key health risk assessment issues associated with manufactured nanomaterials, such as the information on nanoparticle toxicology and exposure assessments as well as the extent to which nanoparticle toxicity can be extrapolated from existing particle and fiber toxicology databases. Recently, proactive multidisciplinary research initiatives have been initiated by the National Centre for Environmental Research

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of the US Environmental Protection Agency and the National Toxicology Program, National Institute of Environmental Health, National Institutes of Health, to address the impact of nanoparticles on human health and the environment. Hopefully some other efforts will allow nanotechnology and nanomaterials to develop responsibly with a full appreciation of their health and environmental impacts.

References

- 1 Colvin VL (2003) The potential environmental impact of engineered nanomaterials. *Nature Biotechnology* 21(10): 1166–1170.
- 2 Dagani R (2003) Nanomaterials: Safe or unsafe? *Chem & Eng News* pp. 30 – 33.
- 3 Du Bois RM, Holroyd KJ, Saltini C, Crystal RG (1991) Granulomas process. In: *The Lung*, pp. 1925 – 1938. R.G. Crystal, J. B. West, P. J. Barnes, N. S. Cherniack, E. R. (Eds) Weibel, Published by Raven Press, NY, USA.
- 4 Masciangioli T, Zhang WX (2003) Environmental technologies and the nanoscale. American Chemical Society. *Environmental Science & Technology*. 102A – 108A.
- 5 Maynard AD, Baron PA, Shvedova AA, Kisin ER, Catranva V (2003) Exposure to carbon nanotube material 1: Aerosol release during the handling of unrefined single walled carbon nanotube material. *Jour. Toxicology and Environmental Health*. In press.
- 6 Murray CB, Kagan CR, Bawendi MG (2000) Synthesis and characterization of monodisperse nanocrystals and close-packed nanocrystal assemblies. *Annu Rev Mater Sci* 30: 545–610.