technique. In addition, HSE also has a very minor role in Nanosafe2, a project within the EU 6th Framework Programme, looking at the safe production of nanomaterials.

5.2.2 Nanotechnology and occupational health – the US/NIOSH perspective

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'Nanotechnology' is a broad term adopted in recent years to describe the manipulation of matter at near-atomic length scales to form new materials, structures and devices. The technology isn't confined to a narrow range of disciplines, but is finding application in many diverse areas of research and development. This ability is opening up incredible opportunities, including efficient energy generation, usage and storage, high performance materials, innovative sensors and targeted medical diagnostics and therapeutics. At its most basic, nanotechnology encompasses the formation of structures between approximately 1 nm – 100 nm that allow unique quantum effects associated with this transition region to be exploited. The other end of the spectrum, which may be on the borderline between possibility and fantasy and certainly won't be realized for many years, is the construction of nanometer-scale machines that are capable of working directly with atoms, molecules or other nanoscale structures. In between these limits lies a reality that is poised to revolutionize society over the coming decades.

In the USA, the Federal Government has placed a strong emphasis on the need to address the societal implications of nanotechnology as it develops, including health impact (US Congress 2003). US Federal Research and Development in nanotechnology is overseen by the Nanoscale Science Engineering and Technology (NSET) subcommittee of the National Science and Technology Council Committee on Technology (www.nano.gov). Federal Agencies participating in NSET are currently funding extensive research into the toxicity, characterization, risk management and application of nanotechnology with respect to human health and the environment. Within NSET, a working group has been assembled specifically to address the environmental and health impact of nanotechnology from the Federal perspective. Formed from representatives of key regulatory and research agencies including the National Institute for Occupational Safety and Health (NIOSH), the Environmental Protection Agency (EPA), The Occupational Safety and Health Administration (OSHA) and the Food and Drug Administration (FDA), this working group is focused on coordinating environmental and health activities between relevant agencies, and facilitating appropriate activities to ensure adverse impact is minimized. The group is also supporting the development of guidelines for the safe handling of nanomaterials – a task that NIOSH is currently undertaking.

NIOSH is the US agency charged with ensuring worker safety and health through research, information, education and training (www.cdc.gov/niosh). The Institute has had a long history of cross-cutting research into the impact of exposure to nanometer-diameter particles from processes such as welding and combustion. More recently,

NIOSH has responded to the need to address exposure to engineered nanomaterials, structures and devices by forming an institute-wide nanotechnology initiative. This involves a coordinated approach to research, partnership and outreach across NIOSH addressing not only the implications of nanotechnology in the workplace, but also the application of the technology to ensure good health. Current research spans studies into the toxicity of carbon nanotubes and other nanomaterials, measurement and characterization of nanomaterials and exposure control. In addition, a joint Request for Applications (RFA) on the environmental and human health effects of manufactured nanomaterials has recently been issued in conjunction with EPA and the National Science Foundation (NSF).

To address immediate occupational safety and health needs within nanotechnology research, production and application communities, the Institute is in the process of developing a series of documents to support the development of good working practice guidelines. The first of these – a brief informational fact sheet – was published in October 2004 (NIOSH 2004). Frequently asked questions and answers on nanotechnology and occupational health will be published on the NIOSH nanotechnology web pages (www.cdc.gov/NIOSH/topics/nanotech) in 2005. These will be followed by a NIOSH Current Intelligence Bulletin on working with engineered nanomaterials in late 2005.

Through these and a number of other initiatives, NIOSH is working with national and international partners towards proactively reducing the potential for nanotechnology to lead to adverse health impacts in the workplace, while seeking ways of applying the technology in beneficial ways.

References

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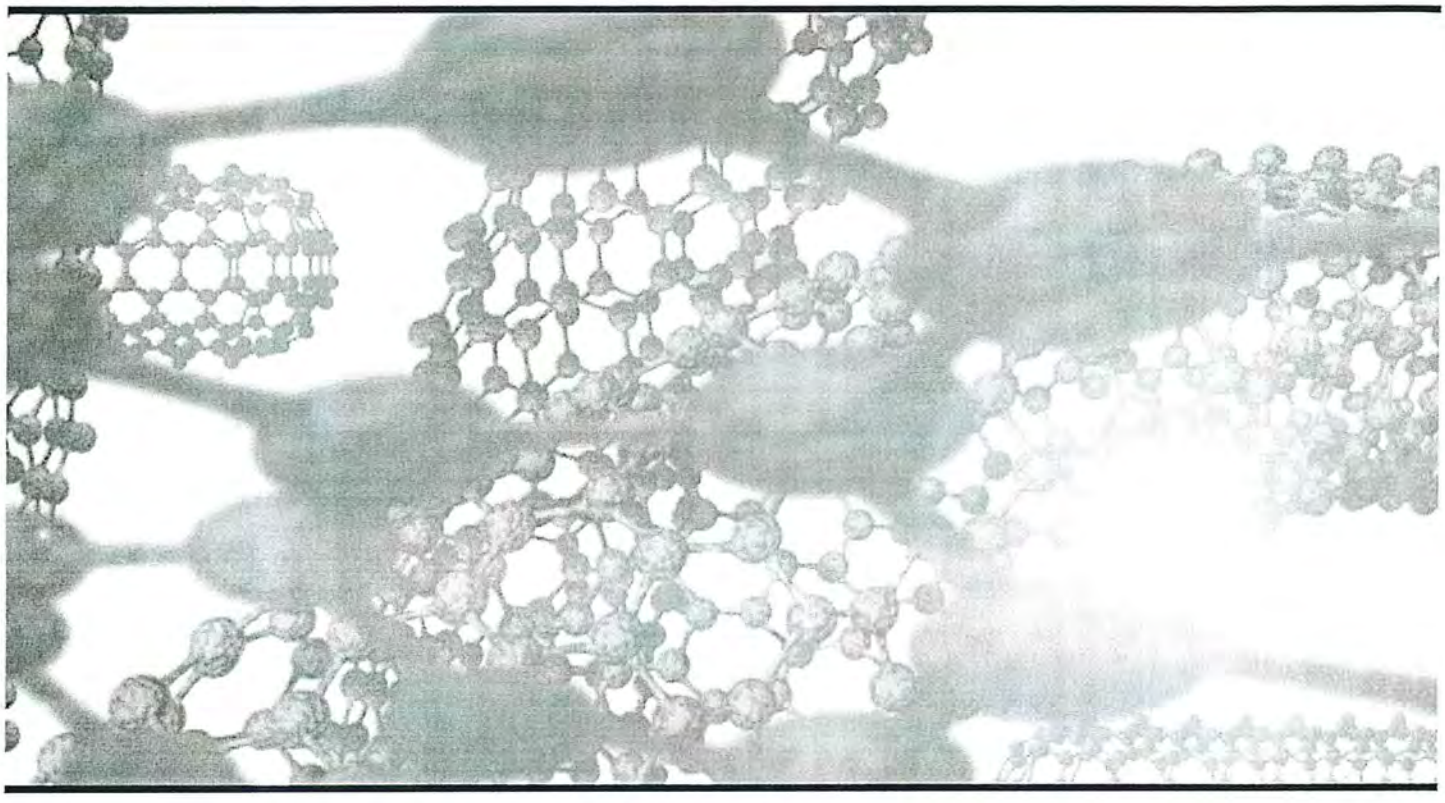
Nanomaterials

a risk to health at work?



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