

Nanotoxicology - new branch of learning

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[Nanotechnology](#), the 'science of small things' is set to bring huge advantages in engineering, electronics, medicine and IT-- but the **potential threats to health** that widespread use of nanoparticles could bring need to be scrutinised, says a University of Edinburgh expert in this month's edition of Occupational and Environmental Medicine.

Professor Ken Donaldson, a lung toxicology expert and Professor of Respiratory Medicine at the University, calls for a new discipline--nanotoxicology-- to be built up, to address knowledge gaps and to help develop a safe nanotechnology. He wants guidelines to be developed to test all materials in the nanoscale where human health could be involved.

Professor Donaldson says: "We believe that efforts to untangle science and science fiction regarding the risks from nanotechnology are needed and that a focus on the potential harmful effects of nanoparticles is both timely and necessary. The importance of nanotechnology to the economy and to our future wellbeing is beyond debate, but its potential adverse impacts need to be studied along the same lines. A discipline of nanotoxicology would make an important contribution to the development of a sustainable and safe nanotechnology .

He added: "Our current knowledge of the toxicology of nanoparticles and nanotubes (tiny carbon tubes) is poor but suggests that nanoparticles may be able to have undesirable effects at their point of entry into the body, for example, the lungs, and might also be able to affect other organs. Nanoparticles in food may cross into the gut lymphatic system

and so reach other organs more easily than larger particles do. Inhaled nanoparticles have been reported to travel from nasal nerves to the brain, a phenomenon seen with some viruses similar in size to nanoparticles."

Nanoparticles, materials the size of millionths of a millimetre, are already present in large numbers in the air from natural sources and from vehicle exhaust emissions. They are also found in sunblocks, boot polish, tyres and photocopier toner. In future, however, they may be used in clothing manufacture, to purify water, clean up contaminated ground, deliver drugs to specific parts of the body or be used as tiny security sensors.

Source: University of Edinburgh

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