Science for Environment Policy
DG Environment News Alert Service
European Commission

3 May 2012

Coordinated efforts needed to ensure safety of nanotechnologies

The potential effects of nanotechnologies on health are considered in a report by the European Academies Science Advisory Council and European Commission Joint Research Center. The report makes recommendations to help scientists and policymakers coordinate their efforts in maximising the benefits – and minimising any negative health effects – of rapidly developing nanotechnologies, across a wide range of applications.

Nanotechnology may lead to important economic and social benefits in the EU, across a broad range of areas including food packaging, energy generation and medical devices. Already, over 1,000 products containing nanomaterials are estimated to be on the market, according to the report, published in September 2011.

People may be exposed to nanomaterials by inhalation, ingestion, contact with skin or medical injections. However, the term nanomaterials covers a very broad range of materials, which all behave differently, and there is limited scientific knowledge about how nanoscale materials behave differently to their corresponding bulk materials. Therefore, it is difficult to generalize the risks that they pose to human health, or to develop policy that adequately addresses risks while encouraging innovation. Currently, nanomaterials are governed under a number of EU- and national-level policy instruments, such as the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) regulations.

One of the main conclusions of the report is that nanomaterials should be subject to the same risk assessment procedures as other new materials, whilst bearing in mind that all nanomaterials are different and require a case-by-case approach. The authors promote the principle of 'safety by design', recommending that more is done to incorporate safety assessment directly into projects in which new materials are being developed. Specific priorities for safety assessment, according to the report, should include establishing how the level of risk associated with nanoparticles is affected by increasing dose, and individual differences in age and genetics, and how nanoparticles behave when they come into contact with human cells. The report also calls for standardised tests in studies of nanoparticle effects. One challenge is the need to improve scientific understanding of the long-term effects of exposure to nanomaterials.

Inhalation in the workplace, for example, during the manufacture of nanoscale materials, perhaps presents the greatest risk to human health. The report highlights the need for this risk to be better characterised, especially as there is very little information on workplace exposure in smaller technology companies. However, focus on inhalation has left gaps in scientific knowledge about other exposure routes and what happens to nanomaterials in the body after initial exposure, requiring further studies.

Recommendations particularly relevant to policymaking include a call for scientists and policymakers to work together to establish common aims for the collection of safety data across different application areas. Within these different application areas, the authors urge that the definition of 'nanomaterial' is harmonised as legislation specific to nanomaterials continues to develop. In October 2011 (after the publication of the report), the European Commission accepted a common definition of nanomaterials based on size – materials with dimensions between 1-100nm.[1] The report also recommends that regulations affecting products containing nanomaterials should be kept flexible enough to allow for future developments as well as innovations that might help to lower any associated risks. Further recommendations include provisions for public engagement to outline the benefits, risks and regulations associated with nanoparticles, and for nano-specific risk assessment training within EU research programmes, targeted at toxicologists, materials scientists and production engineers.

1. EUROPA. (2011). What is a nanomaterial? European Commission breaks new ground with a common definition. http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/1202

Source: EASAC and JRC. (2011). *Impact of Engineered Nanomaterials on Health: Considerations for Benefit-Risk Assessment*. Joint JRC-EASAC Policy Report. Download from: http://ihcp.jrc.ec.europa.eu/our_activities/nanotechnology/nanoreport-10-11/JRC-EASAC-report.pdf

Contact: jrc-ihcp-communication@ec.europa.eu; secretariat@easac.eu **Theme(s):** Chemicals, Environment and health, Risk assessment