Testing nano materials to build consumer confidence

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Engineered nano materials (ENM) are being used more and more in a variety of commercial products. Because of their unique properties and applications, ENM offer the promise of immense technological and economic benefits to industry and consumers. However, there is also concern that some of these properties may be harmful to humans.

While this testing of individual applications of ENM is possible, it is currently expensive and time-consuming and acts as a barrier to innovation. An effective test is required for these properties in order to ensure ENM are safe to use. The FP7-funded research project, NANOSOLUTIONS aims to address this problem by classifying the safety potential of a variety of ENMs.

Launched in April 2013 with a kick-off meeting in Helsinki, Finland, the project team is finding new methods for assessing the disadvantages and risks presented by exposure to industrial nano particles. The long-term goal is to create a set of biomarkers of ENM toxicity to that will ultimately allow the team to develop an 'ENM safety classifier'.

The NANOSOLUTIONS team is conducting research into the interactions of ENMs with living organisms at molecular, cellular and organism levels. Many important functions of living organisms take place at the nano-scale - every day, our bodies are using natural nano materials, such as proteins and other molecules, to control their many internal systems and processes.

ENMs have the potential to induce damage at the cellular, tissue, or organism levels by interacting with cellular structures leading to impairment of key cellular functions. These adverse effects may be mediated by ENM-induced alterations in gene expression and translation, but may involve also epigenetic transformation of genetic functions.

NANOSOLUTIONS' 'ENM safety classifier' will be based on the material characteristics of ENM, using the knowledge acquired on ENM interactions with living organisms at the molecular, cellular and organism level. This will give scientists the ability to predict these harmful effects rather than simply describe them once they have occurred.

Streamlining the process of testing ENMs will also have huge commercial benefits. The classification model will speed up the innovation cycle and make it easier to develop commercially viable products that use ENM. Ultimately, this will build consumer, industrial and regulatory confidence by enabling experts to assess potential unknown dangers effectively.

More information: nanosolutionsfp7.com/

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