
IS17. MECHANISMS OF NANOMATERIAL INDUCED INFLAMMATION

Harri ALENIOUS

Systems Toxicology Team and Nanosafety Research Centre, Finnish Institute of Occupational Health,
Helsinki, Finland

Engineered nanomaterials (ENM) have characteristics that are unique to material offering numerous possibilities to improve the properties of old products and create completely new ones. The rapidly expanding use of ENM will bring hundreds of millions of people in contact with ENM during the next few years. Due to the worldwide use of nanotechnologies, it is crucial to acquire up-to-date knowledge on health effects to avoid any potential risks.

Some of the properties that make ENM so unique and beneficial for technological applications may also endanger human health through the potential induction of cytotoxicity, inflammation and even cancer. These features include a large surface area to mass ratio, increased surface reactivity, altered physico-chemical properties, electrical conductivity, or changes in the crystalline structure of the ENM.

Evidence already exists that exposure to certain type of ENM elicit adverse health effects in experimental models, thus justifying the precautionary approach in assessing risks of ENM. Such effects include the ENM induced pulmonary inflammation in experimental animals. In addition, recent observations reveal that needle-like fibrous CNT may induce asbestos-like granuloma formation and increase the likelihood of mesotheliomas in tumor prone mouse strain. In addition to healthy individuals, a large part of the population has impaired health conditions that may make them more susceptible to develop health problems from ENM exposure.

In this presentation recent understanding on the mechanisms of ENM induced inflammation will be discussed. It will be also discussed how exposure to ENM affects on vulnerary population such as patients with allergic diseases.

* Harri.Alenius@ttl.fi