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Guest editorial:

GEBEL-CRITERIA FOR RISK ASSESSMENT IN NANOTOXICOLOGY

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Risk assessment of nanomaterials represents one of the cutting-edge topics in toxicology (Zhao et al., 2014; Lucafo et al., 2013; Fadeel et al., 2013; Kroll et al., 2012; Kim et al., 2012; Hadrup et al., 2012; Lange and Obendorf, 2012; Xu et al., 2013). Numerous nanomaterial containing consumer products have already been introduced on the market, including textiles, sunscreens, paints, car tyres and electronics (Bolt et al., 2012; Kumar and Dhawan, 2013; Schluesener and Schluesener, 2013; Marchan, 2012). The number of manuscripts published in this field is high, with more 500 publications focusing on nanosafety-associated topics per year (Bolt et al., 2012; Schäfer et al., 2013; Horie et al., 2013; Klein et al., 2012; Hoelting et al., 2013; Silva et al., 2014). It has become clear that a detailed physical and chemical characterization of nanomaterials is required for risk evaluation (Park et al., 2013; Xiong et al., 2013; Zhao et al., 2013; Couto et al., 2014). Among the current challenges are the methodological requirements in exposure monitoring (Babič et al., 2014; Lainé et al., 2014; Su et al., 2014; Bruchet et al., 2013). Because of the enormous variability and the rapid development of novel materials it has become difficult for regulators to keep pace and maintain overview. In this complex situation the Advisory Board of the German Society of Toxicology introduced the Gebel-criteria, a novel concept of risk assessment in nanotoxicology (Gebel et al., 2014). According to this concept, a first step in evaluating novel nanomaterials should be to check whether they belong to one of the three following categories: ***Category 1***: Nanoparticles for which toxicity is mediated by the specific chemical properties of its components, such as relaxed ions. Nanomaterials belonging to this category must be evaluated on a case-by-case basis. ***Category 2*** are rigid biopersistent respirable fibrous nanomaterials. They may cause lung cancer and mesotheliomas, if they show a high aspect ratio. In this case they will act similarly as carcinogenic asbestos fibres. ***Category 3*** are respirable granular biodurable particles. After inhalation they may cause inflammation and finally lung cancer. It should be considered that nanomaterials of categories 2 and 3 are of relevance only after inhalation (Gebel et al., 2014). Considering the complex situation in current nanotoxicology the introduction of the three 'Gebel-criteria' will facilitate risk assessment in future.

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