Information Profiling for Exposure Assessment of Engineered Nanomaterials in Nano-Food and Drug

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The health effects of engineered nanomaterials are not yet clearly understood, although they are already used in a variety of applications. Although several studies have examined the effect of engineered nanomaterials, there is as yet no generally acceptable paradigm for safety and risk assessment of nanomaterials in consumer and other products. Furthermore, it is generally accepted that many areas of nanotechnology do not present new hazards so that current regulatory frameworks are adequate. However, uncertainty about safety may lead to polarized public debate and to business unwillingness to invest further in nanotechnology. Therefore, it is important to ensure that timely policy development takes these issues into consideration. In 2011, Korea Food and Drug Administration started an investigation for preparation of Strategic Action Plan for 2011~2013 to manage future nanoproducts such as nanofoods, nanocosmetic or consumer products. This study aims to investigate the feasibility and challenges associated with conducting a human health risk assessment for nanomaterials based on the open literature. A key element in this report regard concerns a harmonized assessment of the safety of nanomaterials and this requires a strengthened communication between policy-makers and risk assessors. Human exposure to nanomaterials can arise directly form the intended targeted delivery of product to individuals, for example in food, cosmetic and medical applications and indirectly from the unintended exposure of general public from nanomaterials accumulating in the environment during manufacturing, downstream use or waste. After identification of sources, exposures need to be assessed. Human exposure potentially occur through inhalation, oral, and dermal routes, but more is known about inhalation exposure than about other route of exposure. Therefore, it needs to fill up the research gaps about dermal and ingestion exposure relevant to expected exposure of consumers to nanoproducts and through food. Data on toxicokinetics and studies investigating effects of chronic exposure under conditions relevant for human exposure should also be prioritized.