Current regulatory challenges in nanocosmetics, medical devices and food supplements

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Abstract

Nanotechnology is an emerging field capable of revolutionizing many different sectors, creating advanced products and systems that can be applied in a wide range of fields. Nanotechnology encompasses a wide range of sciences such as Physics, Chemistry, Biology, Engineering, Medicine and Informatics. It has been proved that nanoparticles (NPs) exhibit superior physical, chemical and biological properties as well as enhanced performance in comparison with their bulk counterparts. Nowadays, nano-enabled products are rapidly produced with variety of industrial applications and are applied in real life scenarios. However, alongside with the advantages and the excitement over the prospects of nanotechnology enabled materials, there have been increasing concerns regarding the risks and toxicity this field may present. On account of this, it is deemed crucial to establish a regulatory framework in order to protect human and environmental safety. However, to date, regulatory agencies have not yet defined a universal definition of nanomaterials while each region uses its own definitions and legislation to monitor nano-enabled products. Hence, the aim of this study is to present and discuss the existing regulatory framework for various products containing nanoparticles; in particular cosmetics, medical devices and food supplements in three regions, EU, US and China. This study is also outlining the type of NPs that are used in these three types of products as well as the benefits that they offer. Finally, this work is approaching the toxicity issues due to NPs.