

S18-3 Safety analysis of nanomaterials about biodistribution and hepatotoxicity

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Recently, the number of applications of nanomaterials in medicines, cosmetics and foods to which we are directly exposed has been expanding rapidly. The size of nanomaterials used is becoming smaller and particles of 7 nm in diameter are currently used in such applications. The safety of such nanomaterials has not been well assessed, because nanomaterials have been considered as safe as common larger sized materials which are known not to be absorbed by the body. However, recent reports point to possible toxic effects of nanomaterials in humans. Therefore, WHO and OECD are collecting safety information on nanomaterials with a view to regulation of their use. Although assessment of in vivo behaviors of nanomaterials, (i.e. absorption and distribution, and correlation analysis with hazard information) is urgently needed, such research has not yet been undertaken. In this regard, using amorphous nanosilicas (nSP) as model nanomaterials, our group is firstly starting to study safety, in vivo behavior and their correlation; nSP are often used in cosmetics and foods and also, downsized particles are rapidly becoming available. In our study, we have found that nSP below 100 nm in diameter show significantly different characteristics in in vivo behavior and biological effects i.e. penetration through skin and distribution to brain. In this presentation, we would like to discuss the importance of studies in physicochemical characteristics, kinetic behaviors, and biological effects of nanomaterials below 100 nm in size, to ensure their safety.