

## GS6-1 Evaluation of Biological Influence of Nano-materials using Toxicokinetics and Toxicoproteomics

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With recent developments in nanotechnology, nanomaterials have been successfully employed in various industrial applications such as medicine and cosmetics. Nanomaterials show useful properties such as electronic reactivity and tissue permeability, in contrast to micromaterials which lack such properties. Thus, nanomaterials show potential as innovative materials for medical applications and the cosmetics industry. However, these innovative properties may be associated with unforeseen toxicity undetectable using conventional toxicity assays. In the interests of industrial development and the affluent elements in society that enjoy only the benefits of nanomaterials, there is an urgent need to gather information on the properties and biological effects of nanomaterials, and to establish standard safety evaluation methods. Therefore, we are analyzing associations between properties such as biodistribution and biological effects of nanomaterials, to search for safety biomarkers (functional, molecular and biochemical biomarkers) using nanosilicas (SP) as a standard nanomaterial. Because SP show high uniform dispersibility and are already used in medicine, in cosmetics and in food additives, it will be possible to extrapolate the results of this study to other nanomaterials and to be put to practical use as safety biomarker of nanomaterials. In this presentation, we introduce the latest knowledge on linkages between properties such as biodistribution and biological effects of SP using toxicokinetic and proteomic analysis. We also describe a search study for safety biomarkers based on this fundamental information.