

## **Effect of nanomaterials on the induction of cell death**

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As a growing applied science, nanotechnology has considerable global socioeconomic value, and the benefits afforded by nanoscale technologies are expected to have substantial impacts on almost all industries and areas of society. Nanotechnology has produced a diverse array of nanomaterials such as carbon nanotubes, fullerene derivatives and quantum dots. The advent of nanomaterials has provided incredible opportunities for biomedical applications such as therapeutic and diagnostic tools, in addition to applications in engineering, electronics and optics. Biomedical applications under development include targeted drug delivery systems for the brain and tumor tissues and intravascular nanosensor and nanorobotic devices for imaging and diagnosis. On the other hand, the potential adverse effects of nanomaterials on human health remain to be established. As with micro-scale substances, risk assessment will be the basis of assessing and regulating nanomaterials to protect health and the environment. The property of nanomaterials is not the same as their larger counterparts, and we must investigate the safety and toxicity of nanomaterials clearly. Recently, we have tried to clarify the property and safety of nanomaterials *in vivo* and *in vitro*. In this study, we will review the *in vivo* pharmacokinetics of nanomaterials and effects against cells such as endothelial cells and macrophages.