

## NANOMATERIALS: “NANO-ANGELS” OR “NANO-DEMONS”?

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Nanotechnology and nanoscience research represent a key aspect for the development of innovative material and new productive sectors at the service of citizens. Nanoscale materials (NM) show very different properties compared to what they exhibit on a macroscale and their extraordinary properties enable unique applications, e.g. in ceramic, textile, cosmetic, optic, chemical and food industry and biomedicine. On March 2011, more than 1300 manufacturer nanotech goods have been identified on the market, a rise of 512% when compared to the first inventory in 2006. In this context, It is easy to understand how the great innovation potential of NM has led some people to label them as “nano-angels”. However, in spite of hundreds of NM-containing products are already in commercial production, toxicological evidences are emerging concerning their harmful effects to biological systems and a huge health and safety questions remain unsolved. This is enough for some people to label NM as “nano-demons”. This dualism, based mostly on emotion than on reliable scientific data, has raised heated controversy in the scientific community, with debates dominated by severe disputes between scientism and technophobia that disconcert a public opinion already *per se* poorly informed. It is not surprising that researchers and governmental organizations are pressed to consider seriously the need to assess potential health risks of NM before they become ubiquitous in every aspects of life. Unfortunately, at present, scientific knowledge is insufficient for a risk assessment of NM and the scientific community has not reached a consensus about their health safety.

The aim of this presentation is to highlight the urgent need of nanotoxicology research for the development of sustainable NM that at present we cannot be considered exclusively as “nanoangels” or “nanodemons”. What we need is to gain toxicological scientific knowledge to address the prevention and the management of environmental and health risks deriving from the use of NM, not to stifle innovation but to promote their safe development.