

**Nanotoxicity: Experimental Toxicology
of Nanoparticles and Their Impact
on the Environment**

Research on the environmental impacts of nanomaterials is still in its infancy.¹ Indeed, work on humans is more advanced, because there is an urgent need to understand the consequences for those in direct contact with nanoparticles.

Transfer into ecosystems, complex interactions with solutes and organic molecules present in high concentrations in soil and water, and toxicity studies on micro-organisms and multicelled organisms serving as bioindicators for pollution are examples of cross-disciplinary subjects requiring us to understand what happens to nanoparticles in aqueous media from the atomic scale (redox changes, dissolution, transport of pollutants to the surface) to that of the porous medium, before investigating bioavailability, which involves a tiny fraction of these nanoparticles.

Toxicity (cytotoxicity and genotoxicity) studies are then possible. One of the difficulties is that, in order to be credible, one must work on the trophic chains transferring over long periods very small quantities of nanoparticles resulting from the degradation of nanoengineered materials.

¹ Introduction by Jean-Yves Bottero, Director of Research at the CNRS and the CEREGE.