Interactions between manufactured nanoparticles and individual cells

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Biological activity is playing a crucial role in the cycling of elements at the Earth's surface. With the development of human activity new solid materials are dispersed thereby raising the question of their mobility, toxicity and persistence in the ecosystems. This is particularly true concerning the development of nanomaterials. The general context of our work is to assess the role of micro-organisms in the life cycle of manufactured nanomaterials (toxicity, biodegradation…) More specifically we aim at determining the mechanisms of interaction between manufactured nanomaterials and cells. Cerium and iron oxides were used in contact with *E.Coli* cells. Results combining various microscopic (TEM) and synchrotron based spectroscopic techniques (XAS) indicated that redox phenomena occurred at the cell wall surface and can be linked to toxicological effects. Such redox phenomena also affected the stability of manufactured nanomaterials.