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nanomaterials for understanding nano-cellular interactions / Henriqueta Louro -- Toxicogenomics: a new paradigm for nanotoxicity evaluation / Sourabh Dwivedi, Quaiser Saquib, Bilal Ahmad, Sabiha M. Ansari, Ameer Azam, Javed Musarrat -- Nickel oxide nanoparticles induced transcriptomic alterations in HEPG2 cells / Quaiser Saquib, Maqsood A. Siddiqui, Javed Ahmad, Sabiha M. Ansari, Mohammad Faisal, Rizwan Wahab [and others] -- Nanoparticle-protein interaction: the significance and role of protein corona / Saad Mohammad Ahsan, Chintalagiri Mohan Rao, Md. Faiz Ahmad -- Cellular and molecular toxicity of iron oxide nanoparticles / Blanca Laffon, Natalia Fernández-Bertólez, Carla Costa, Fátima Brandão, João Paulo Teixeira, Eduardo Pásaro [and others] -- Detection of DNA damage induced by cerium dioxide nanoparticles: from models to molecular mechanism activated / Tiago Alves Jorge de Souza, Thiago Lopes Rocha, Leonardo Pereira Franchi -- Mechanisms underlying neurotoxicity of silver nanoparticles / Lidia Struyska, Joanna Skalska -- Toxic and beneficial potential of silver nanoparticles: the two sides of the same coin / Lilian Rodrigues Rosa Souza, Veronica Santana da Silva, Leonardo Pereira Franchi, Tiago Alves Jorge de Souza -- Molecular and cellular toxicology of nanomaterials with related to aquatic organisms / Mohd Ashraf Rather, Irfan Ahmad Bhat, Niti Sharma, Rupam Sharma -- Cytotoxicity and physiological effects of silver nanoparticles on marine invertebrates / Adriano Magesky, Émilien Pelletier -- A Drosophila model to decipher the toxicity of nanoparticles Taken through oral routes / S. Aurosman Pappus, Monalisa Mishra -- Using of quantum dots in biology and medicine / Svetlana Pleskova, Elza Mikheeva, Ekaterina Gornostaeva

Sommario/riassunto

This edited book is a compilation of findings on the molecular and cellular toxicity of nanoparticles (NPs) in animal cell, human cells, invertebrates. The varied selection of test models will provide better understanding about the horizon of NPs toxicity. Interaction of NPs with cells and its organelles can induce toxicological consequences, including transcriptional and translational alterations, DNA damage, cytotoxicity, oxidative stress, mitochondrial dysfunction and cell death. NPs can get internalized in cells through phagocytosis, macropinocytosis, receptor-mediated endocytosis and passive penetration, which can affect varied cell types. Readers will be benefited with the compilations on basic and molecular facet of NPs toxicity. The chapters will provide a comprehensive information on the state-of-the-art methodologies. The application of toxicogenomic approaches, which is already established in nanotoxicology, has been given special consideration to unravel the toxicodynamics of nanomaterials. Among these approaches, the high-throughput RNA sequencing (RNA-Seq), which is able to build a complete map of transcriptome across different cell types and perturbations upon NPs exposure has been included. The readers are also introduced to the less studied topic on the adsorption of biomolecules (mainly proteins) on the NPs surface, constituting the so-called "biomolecular corona". The book has been designed for scientists engaged in NPs toxicity research. Nonetheless, it should be of interest to a variety of scientific disciplines including marine biology, environmental pollution, genetics, pharmacology, medicine, drug and food material sciences, consumer products. Also, the compilations will be of interest to the environmental watchdogs, federal regulators, risk assessors and the policy makers