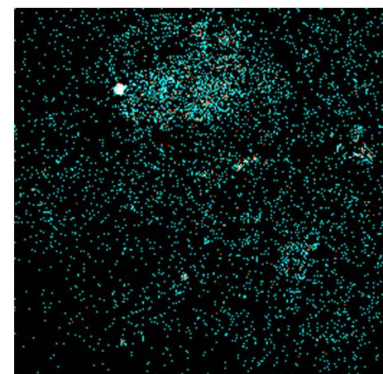
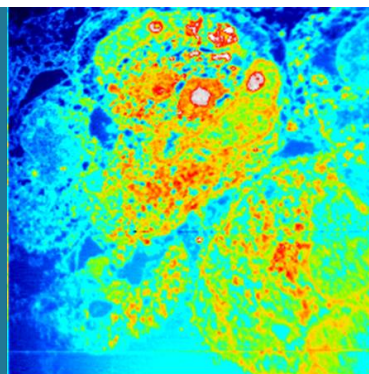


MODENA

Developing knowledge for the prediction of nanomaterial toxicity



NanoSIMS50 image showing the distribution of carbon in several cells (left) and the uptake of Ag in these cells (right). Brightness reflects amount of carbon respectively silver.

Inspiration

Nanotechnology produces engineered nanomaterials (ENMs) that have new or enhanced physico-chemical properties in comparison to their micron-sized counterparts. Some of these properties, like a high surface area to volume ratio, make them very interesting for technological applications but at the same time make them potentially dangerous to humans as shown by research in the field of nanotoxicology.

Innovation

To promote the development of a new generation of ENMs that are 'safe-by-design', an understanding of the relationship between ENM structure and biological activity is needed. In this context, the Quantitative Nanostructure-Toxicity Relationships (QNTR) computational modelling technique is an effective alternative to experimental testing since it enables the prediction of (eco)-toxicological effects based on ENM structure only. The construction of the QNTR model requires the integration of expertise from nanomaterial scientists, (eco)-toxicologists, and modellers from academia, regulatory agencies and industry.

Impact

MODENA, an Action of the intergovernmental European research framework COST, will promote the coordination of interdisciplinary collaborations of different parties with the ultimate aim of producing QNTR models for ENMs. The results will include:

- the development of a new generation of safe-by-design ENMs
- a reduction of the need for animal testing
- the creation of transparent, validated and rigorous QNTR tools for regulatory purposes in the field of nanotoxicology according to OECD principles.

Partners

Institute of Occupational Medicine (UK)

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