

In vitro models for genotoxicity assessment of nanomaterials

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The chemical-physical characteristics of nanomaterials, that determines their versatility, are also an element of concern due to their possible adverse effects on biological systems that cannot be predicted on the basis of their chemical composition and the behaviour of the respective compounds not in nanoform. Experimental evidences indicate that NMs can penetrate through cell membranes and interact with DNA. The evaluation of the genotoxic potential is a basic component of chemical risk assessment process and requires the evaluation of different end-points (i.e. induction of gene mutations, structural and numerical chromosomal alterations), as each of these events may be implicated in the process of carcinogenesis and induction of heritable diseases. However, validated genotoxicity assays that have been widely used for decades to identify the risk of chemical agents not in nanoform may not be adequate for the assessment of nanomaterials or may need to be adapted to take into account the specific properties of nanomaterials.