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Protein-based nanotoxicology assessment strategy

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Abstract

The nanomaterial community calls for standardized in vitro assays to determine nanoparticle toxicity in the effort to reduce the number of in vivo validation experiments. We demonstrate that chip-based protein detection is suitable for assessing toxicity and may complement traditional assays to improve selection of primary hits for subsequent analysis. As nanodrug mimics, we analyzed the effect of transiently transfected siRNAs in MCF7 breast cancer cells and normal MCF12A breast cells, resembling a differential screen. As a measure of cytotoxicity, we determined cell viability as well as protein expression of glyceraldehyde-3-phosphate dehydrogenase, transferrin receptor, and the proliferation marker Ki67. The evaluation of cell lethality and protein expression unraveled cellular effects overseen by one method alone

Full text:

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