

Comparison of Different in vitro Models of the Blood-Brain Barrier for Study of Toxic Effects of Engineered Nanoparticles

Authors : Samir Dekali, David Crouzier

Abstract : Due to their new physico-chemical properties engineered nanoparticles (ENPs) are increasingly employed in numerous industrial sectors (such as electronics, textile, aerospace, cosmetics, pharmaceuticals, food industry, etc). These new physico-chemical properties can also represent a threat for the human health. Consumers can notably be exposed involuntarily by different routes such as inhalation, ingestion or through the skin. Several studies recently reported a possible biodistribution of these ENPs on the blood-brain barrier (BBB). Consequently, there is a great need for developing BBB in vitro models representative of the in vivo situation and capable of rapidly and accurately assessing ENPs toxic effects and their potential translocation through this barrier. In this study, several in vitro models established with micro-endothelial brain cell lines of different origins (bEnd.3 mouse cell line or a new human cell line) co-cultivated or not with astrocytic cells (C6 rat or C8-B4 mouse cell lines) on Transwells® were compared using different endpoints: trans-endothelial resistance, permeability of the Lucifer yellow and protein junction labeling. Impact of NIST diesel exhaust particles on BBB cell viability is also discussed.

Keywords : nanoparticles, blood-brain barrier, diesel exhaust particles, toxicology

Conference Title : ICT 2015 : International Conference on Toxicology

Conference Location : London, United Kingdom

Conference Dates : February 16-17, 2015