Morphological Lesions in Mouse Liver and Lungs After Lung Exposure to Carbon Nanotubes - DTU Orbit (12/08/2019)

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Introduction: Engineered nanoparticles are smaller than 100 nm in at least one direction and designed to improve or achieve new physicochemical properties. Consequently, toxicological properties may also change. Carbon nanotubes have attracted industrial interest due to their unique properties.

Materials and Methods: One day before mating, 30 mice (C57BL/6BomTac, Taconic Europe, Denmark) were given 67 μg multi-walled carbon nanotubes (NM-400, Nanocyl, Belgium) intratracheally (group A). A further 30 control mice (group B) received vehicle (Millipore water with 2% mouse serum). Lungs and liver were taken from six animals from each group for histopathological examination (haematoxylin and eosin staining) 6 weeks (A1, B1 group) and 4 months (A2, B2) after exposure.

Results: Lungs in A1 mice showed bronchiolar subepithelial oedema and perivascular oedema and the presence of macrophages. Oedema was slight in A2 mice, but infiltration of macrophages was more intense. In the liver, microfoci of necrosis, infiltration of inflammatory cells and lesions of Kupffer cells were more intense in A1 than A2 mice.

Conclusions: Intratracheal exposure to multi-walled carbon nanotubes caused inflammatory and degenerative lesions in mouse lungs and liver.