

## **Oxidative stress and inflammation induced by Diesel Exhaust Particles: pilot study in a model of neuronal cells.**

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In recent years particulate matter (PM) has been found to trigger several mechanisms responsible for neuroinflammation, and accumulating evidence points to neuroinflammation as an active participant in the progression of neurodegenerative diseases. This project aimed to assess whether, in a model of neuronal cells, PM, specifically ultrafine particles (UFP), induces oxidative stress and inflammation. We performed *in-vitro* analyses using HT22 cells, an immortalized mouse hippocampus cell line. HT22 cells have been treated for 3h and 24h with DEP SRM1650b (Standard Reference Material, National Institute of Standards and Technology, USA), a diesel particulate with aerodynamic diameter of 0,18 µm, suspended at different concentrations (10 µg/ml, 25 µg/ml, 50 µg/ml, 100 µg/ml) in culture medium. The following parameters have been measured: cell viability, oxidative stress related toxicity and activation of inflammation pathways. MTT viability assay demonstrated that DEP does not induce a significant cell death neither at 3h nor at 24h of treatment, for all the doses used. After 3h of DEP treatment, protein analysis revealed the presence of oxidative stress; in fact DEP induced a significant dose-dependent increase of HO-1 levels, a stress related protein which catalysed heme degradation. The increase of iNOS protein levels suggests the activation of inflammation pathway, although we need further studies to confirm it. Moreover, we observed an increase in Cyp1B1 levels, a cytochrome of the P450 superfamily involved in the activation of many xenobiotics and in polycyclic aromatic hydrocarbons metabolism, and in HSP70 levels, a protein activated in cellular stress conditions. After 24h of DEP treatment, analysis showed that HO-1 and HSP70 protein levels are still high, although the dose function increase is more pronounced at 3h, whereas Cyp1B1 and iNOS return almost to control levels. Based on the data so far available, we can hypothesize that exposure of neuronal cells to DEP results in the induction of oxidative stress and in the activation of inflammation pathway.