

MEETING ABSTRACTS

CAN THE ACCUMULATION OF NANOGRAFENE IN CELLS CHANGE THEIR MOTILITY?

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Graphene has been used increasingly in recent years in many fields for its unique physical, chemical and optical properties such as optical sensitivity, electronic and thermal conductivity. (1, 2). For this reason, it is important to verify its biocompatibility and the effect of graphene cell accumulation on metabolism, cell proliferation and motility. We tested a stable lung epithelial cell line A549 treated with chronic doses of nanographene platelets PlasmaChem GmbH (Berlin, Germany, product number PL-P-G750) in non-toxic concentrations of 5, 15 and 30 µg/ml graphene for 8 weeks. After this long-term cultivation the cells were analysed for metabolism, proliferation, cell cycle and motility. In this presentation, we focused on the study of cell migration, motility and microscopic imaging of the cytoskeleton and graphene accumulation in cells.

Our results demonstrate that accumulation of graphene platelets significantly decreased motility of cells. The motility was studied as chemotaxis in transwell assays and spontaneous cell motility (3). Chemotaxis migration was limited to 25% and spontaneous motility to 54% compared to control.

We consider the findings obtained in this pilot study important, since cellular motility is a key component of vital biological processes and survival of cells with accumulated graphene platelets could potentially impair regeneration of tissues.

The work was supported from ERDF-Project Strengthening interdisciplinary cooperation in research of nanomaterials and their effects on living organisms, No. CZ.02.1.01/0.0/0.0/17_048/0007421.

Keywords: cell migration; A549; graphene nanoplates; chronic exposure

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