18th NARECOM – NAnoEnviCz REsearch COmmunity Meeting

15th June 2022 from 2:30 p.m.

**Whole-genome Expression Analysis in THP-1 Macrophage-like Cells Exposed to Various Nanomaterials**

**Ing. Mgr. Táňa Závodná, Ph.D.**

*Department of Genetic Toxicology and Epigenetics, Institute of Experimental Medicine of the Czech Academy of Sciences, Prague, Czech Republic*

Abstract:

From the perspective of the immune system, nanomaterials (NMs) represent invading agents. Macrophages are immune cells residing in all organs and tissues as the first line of defense. Interactions of macrophages with NMs can determine the fate of NMs as well as their potential toxic effects. Transcriptomics (the study of mRNAs transcribed from the genome) provides a useful tool to get insight into molecular mechanisms underlying these complex interactions and their role in NM toxicity. In this study, we compared the toxicity of different types of NM-100 (TiO2, 110 nm, non-soluble), NM-200 (SiO2, 150 nm, mildly soluble), NM-110 (ZnO, 20 nm, highly soluble), and NM-300K (Ag, 20 nm, highly soluble), towards Phorbol 12-myristate 13-acetate differentiated THP-1 macrophage-like cells. The cells were incubated with concentrations of 1, 10 and 25 µg/ml of NMs (determined as non-, cytotoxic using the MTS assay) for 24 hours. Microarray technology was carried out to analyze changes in the whole-genome expression. In the lecture, different molecular responses of the macrophage-like cells exposed to the selected NMs will be presented with a focus on the potential contribution of macrophages to the toxic effects of NMs.

