

19.05.2022

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The IUF – Leibniz Research Institute for Environmental Medicine investigates the molecular mechanisms through which particles, radiation and environmental chemicals harm human health. The main working areas are environmentally induced aging of the pulmonary system and the skin as well as disturbances of the nervous and immune system. Through development of novel model systems, the IUF contributes to the improvement of risk assessment and the identification of novel strategies for the prevention / therapy of environmentally induced health damage. The working group of “Alternative method development for environmental toxicity testing” led by Prof. Ellen Fritsche is looking for

A student (f/m/d) for a Master Thesis with the title:

Molecular and cellular studies for the understanding of flame retardants single modes-of-action on oligodendrogenesis *in vitro*

The project: Oligodendrocytes (OL) belong to the glial cells of the central nervous system and are responsible for axon myelination thereby facilitating rapid saltatory conduction of neuronal action potentials. During development, neural stem/progenitor cells give rise to committed oligodendrocyte precursor cells (OPC) which proliferate and migrate to the final site of myelination. Developing OL can be affected by a large variety of substances through a broad spectrum of modes-of-action (MoA). An impairment of oligodendrogenesis, e.g. due to exposure towards developmental neurotoxic substances, contributes to functional adverse outcomes manifesting in neurological disorders such as the Alan-Herndon-Dudley Syndrome or periventricular leukomalacia. In the toxicological context, however, oligodendrocytes, despite their high susceptibility to a large variety of stressors, are an understudied cell type as most developmental toxicity studies deal with neurons and astrocytes.

Within the ‘Neurosphere Assay’, a primary *in vitro* cell culture model based on human neural progenitor cells, which mimics a variety of neurodevelopmental processes, e.g. proliferation, migration and differentiation into neural effector cells (astrocytes, neurons and OL), we identified OL as the most sensitive cell type for a broad variety of substances, among them flame retardants (FR). Despite regulations like REACH (Registration, Evaluation, Authorization, and Restriction of Chemical substances), several FR have already been marketed without having a full toxicological profile, specifically their neurodevelopmental hazards have not been sufficiently investigated. The aim of this project is to investigate the molecular hazards of different FR classes on oligodendrogenesis and identify their MoA by using methodologies of qRT-PCR, immunocytochemical staining, western blot as well as detailed transcriptomic analyses. The outcome of this master thesis will be embedded to complete the superior project with the final goal of *in vitro*-to-*in vivo* extrapolations allowing a neurodevelopmental risk assessment for FR.

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Your profile: Our working group is looking for a motivated employee with a high level of commitment, fun at work, motivation, communication skills and team spirit. The applicant should have a completed bachelor's degree in life sciences. An additional (master) training in the field of toxicology or pharmacology is a plus. Hands on experience in cell culture is desirable. Furthermore, good knowledge of English is mandatory.

We offer: We are an interdisciplinary, international team with a pleasant working atmosphere. We offer thorough training in a highly topical, challenging area of research. The project takes place in a team with other scientists, in part from industry, with whom there will be an intensive exchange of content on project-relevant results.

Start: As early as possible.

Please address your application (short letter of motivation, CV, qualification certificates), preferably electronically to Bewerbung@IUF-Duesseldorf.de:

Prof. Ellen Fritsche
IUF – Leibniz-Institut für umweltmedizinische Forschung
c/o Personalstelle
Auf'm Hennekamp 50
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Application documents submitted by post are not returned. Documents for applicants not considered are destroyed appropriately once the procedure is complete.

