BECA ESTUDIOS MEDIOAMBIENTALES EN EL KAROLINSKA INSTITUT DE ESTOCOLMO.

Se oferta una beca de 7 meses de duración en Estocolmo. Antes se debe hacer una estancia breve en el laboratorio de la UMH responsable de este acuerdo para iniciarse en la línea de investigación.

Inteersados ponganse en contacto con el del Instituto de Bioingeniería: Prof. Javier Esteban (jesteban@umh.es), indiquen la nota media en el Curriculum y adjunten expediente.

DESCRIPCION DEL TRABAJO:

Description of the work experience:

Our modern society is characterized by a broad use of large amounts of thousands of chemicals to maintain a high living standard, and a comfortable and flexible lifestyle. Many of these chemicals are present in a wide variety of everyday products, including food and feed, and, in addition, end up in living organisms and eventually in human populations. The links between health effects and exposure to chemicals has attracted much attention during recent years, both nationally and internationally. An increasing number of studies indicate that the most sensitive population groups are the developing fetus and newborns. Exposure during specific stages of development are suspected to induce irreversible organisational damage, leading to malformations or impaired organ function, which may manifest much later during life. Suspected consequences include subtle cognitive and behavioural disturbances, increased risk of cardiovascular disease, osteoporosis, diabetes, allergy and immune deficiency, cancer, and impaired reproduction. Within the Institute of Environmental Medicine (IMM) at Karolinska Institutet, we conduct research within the fields of endocrine toxicology and environmental medicine with the aim to better understand the impacts of exposure to environmental pollutants on human health in order to contribute to disease prevention as well as to food and chemicals safety. We use model systems and human study cohorts to perform our toxicology research and assessment of the potential adverse effects of environmental chemicals on endocrine, reproductive and developmental systems.

Knowledge, abilities and competitions that the graduate will acquire:

In this project, you will use a toxicogenomic approach to evaluate biological pathways that are disrupted in the liver following acute exposure to Brominated flame retardants (BFRs).

You will gain experience in data analysis, data management, NCBI databases, Gene Ontology tools and Ingenuity Pathway Analysis software. You will assess global gene expression changes from microarrays (Agilent platform) and confirm these changes using quantitative RT-PCR (SYBR GREEN) and in situ hybridizations. To analyze candidate gene involvement in hormone dependent transcription, epigenetic technologies may be performed. Assays for determining hormone and retinoid levels will also be used.

Detailed program:

Brominated flame retardants (BFRs) are a class of endocrine disrupting compounds (EDCs) that were widely used to protect population from accidental fires. Although most countries have banned production of penta and decabromodiphenyl ethers as well as hexabromocyclododecane, the general population continues to be exposed due to the persistence and bioaccumulation of those BFRs. We are interested in monitoring large scale changes in transcripts across the genome to identify biological profiles that may be indicative of toxicity following EDC exposure.

The aim of this project is to combine computer-assisted software, molecular biology and functional analyses to elucidate and confirm some of the regulatory networks orchestrating the transcriptional changes following BFR exposure. This project will significantly contribute towards the identification and development of biomarkers that can be used to facilitate the establishment of reliable relationships between individual BFR congener exposure scenarios and functional outcomes.

Tasks to be carried out:

1) Use bioinformatic analysis and Ingenuity Pathway Analysis software to identify genome profiles, pathways and candidate genes following exposure according to gender.
2) Use bioinformatic analysis and Ingenuity Pathway Analysis software to identify genome profiles, pathways and candidate genes following exposure according to individual BFRs.
3) Isolate RNA from liver samples and confirm genome profiles, pathways and candidate genes following exposure according to gender and BFRs using real-time quantitative PCR.
4) Data analysis and reporting.

Work centre information:

Company: Institute of Environmental Medicine / Karolinska Institutet
Department: Unit of Environmental Health Risk Assessment
Location:Karolinska Institutet, Box 210 - 17177 Solna (Stockholm).Sweden.