

Postdoctoral positions on systems medicine for chemical safety (liver, brain, kidney)

ONTOX

Ontology-driven and artificial intelligence-based repeated dose toxicity testing of chemicals for next generation risk assessment

Funding: European Commission H2020 GA: 963845

ONTOX project: <https://cordis.europa.eu/project/id/963845>

Biomechanics Research Unit: <http://www.biomech.ulg.ac.be/>

GIGA institute: <https://www.giga.uliege.be>

General information

The “**ONTOX**” project, supported by a European grant of more than 17 million Euros, is looking with 18 European and American partners for innovative methods to evaluate the safety of chemical substances without using laboratory animals (extended description, see below). The project starts on May 1st 2021 and lasts 5 years. The university of Liège will work on developing in silico tools to collect information and predict safety of chemical substances. The developed methods will be generic, however, the project will deliver proof-of-concept for 2 specific manifestations of systemic toxicity in 3 organs, namely steatosis and cholestasis in the liver, tubular necrosis and crystallopathy in the kidneys, and neural tube closure and cognitive function defects in the developing brain.

The university of Liège is hiring at least 2 **postdoctoral researchers for 3-year contracts**. The researchers will be expected to:

- gather physiological and pathological information at the molecular and cellular level for the selected systemic repeated dose toxicity effects and their corresponding organs (gene, protein, organ level) from literature, general databases (WikiPathways, AOP Wiki) and tissue-specific databases;
- build quantitative physiological maps of human liver, kidneys and developing brain, following knowledge-based and data-based approaches, implementing the maps in existing software platforms such as Cell Designer;
- establish ontologies, i.e. quantitative AOP networks with kinetic information of KEs, for the systemic repeated dose toxicity effects in the selected organ systems.

Ideal candidates are expected to have a **background in (biomedical/computational) engineering (or equivalent) with a proven interest in toxicity or a background in pharmaceutical or biomedical sciences (or equivalent) and a proven interest in computational systems biology**. Experience with one of the organ systems focused on in the project is a definite plus. We are looking for a dynamic and flexible person, able to work independently but also as a team. You will be part of the ONTOX

consortium, an international consortium with partners from EU and USA, which will be the main source of information and input required to perform the described work. You will be encouraged to develop your own network, within the host institute, the consortium and beyond. You will be encouraged and coached into writing your own research grants.

We offer a young, dynamic and stimulating work environment in an interdisciplinary research group working on a variety of biological applications. The group is part of the GIGA institute, the center of excellence for biomedical research in the university of Liège, offering an interdisciplinary research environment with access to state-of-the-art facilities and technical platforms.

The position will remain open until all vacancies are filled.

Hiring Institution: University of Liège

Web: <https://www.uliege.be>

Address:

Université de Liège
Place du 20-Août, 7
4000 Liège – Belgique

Type of contract: temporary (36 months)

Job status: full-time

Hours per week: 38 hours

Offer starting date: 01/05/2021

Project description

Before chemicals, such as pharmaceuticals, food additives, cosmetic ingredients and pesticides, can be placed onto the market, they must first undergo rigorous testing to ensure their safety. Traditionally, this is done on the basis of protocols that have been laid down in a regulatory manner and that often rely on the use of large numbers of laboratory animals. This approach is increasingly criticized from an ethical point of view. In addition, this approach assumes that results obtained in animal studies are relevant to humans.

However, especially in the pharmaceutical sector, it has now become clear that up to half of the animal experiments are insignificant for humans due to so-called interspecies differences between humans and animals. For these reasons, worldwide attention has gradually shifted especially in the last two decades to the development and application of non-animal methods for evaluating the safety of chemical substances. In the cosmetic sector, animal testing has even been fully banned by law within the European Union for several years, an example that is increasingly followed by various non-European countries.

Such non-animal methods mainly concern cell culture methods using human cells and computer models, referred to as in vitro and in silico methods, respectively. The “**ONTOX**” project, which is an acronym of “**ontology-driven and artificial intelligence-based repeated dose toxicity testing of chemicals for next generation risk assessment**”, makes optimal use of such in vitro and in silico

methods, and is based on 2 pillars, namely ontology and artificial intelligence. Ontology denotes a pragmatic way of collecting and rationally presenting information about chemicals of various nature already available from all kinds of sources. This is done, amongst others, by means of artificial intelligence, whereby an attempt is made to provide the necessary human intelligence to a computer in order to accurately predict the safety of chemical substances for humans. The “ONTOX” project will focus specifically on toxic effects induced by a wide range of chemicals on the liver, kidneys and brain. However, the methodology and strategies that will be developed are equally applicable to other organs and organ systems. The “ONTOX” consortium is made up of several prominent academic groups and companies from 8 European countries and the US, and combines a wide variety of disciplines, including natural sciences, applied sciences and social sciences. In addition, there will be close cooperation with various regulatory authorities worldwide in view of quick implementation of the new non-animal methods and strategies.

Application Process

Please send a **full CV** and a **motivation letter** to Prof. Liesbet Geris (liesbet.geris@uliege.be) and Dr Bernard Staumont (local project manager - b.staumont@uliege.be). The **title of the application email** should be **“ONTOX postdoctoral position ULiège”** in order to ensure correct processing.

The position will remain open until all vacancies are filled.