

Post Doctoral position in cyto-genotoxicity of nanoparticles

Offer type: Job

Contrat: temporary – POST-DOC

Salary: from 29 500 to 34 500 € annual gross

Employeur: Aix-Marseille Université

Workplace: Marseille, FRANCE – frequent missions in CEA Grenoble, France.

Spécialité: Biology, **Genetic toxicology**, human health – **Molecular and cellular biology**

Application deadline: 20 January 2018

Mission :

This is a 24-month postdoctoral contract starting on **February 10th, 2018**. The candidate will conduct the cytotoxicity / genotoxicity characterization of various nanoparticles, each of which being the subject of a "case study" supported by the Labex SERENADE.

This project is collaborative and multidisciplinary. It includes physico-chemists in charge of the design or modification of nanoparticles as well as their characterizations in different media, and biologists in charge of evaluating the responses of different biological systems exposed to native and modified nanoparticles.

The candidate will be based in Marseilles (France) within the Biogenotoxicology, Human Health & Environment team of the IMBE (Mediterranean Institute for Biodiversity and Marine and Continental Ecology - UMR AMU - CNRS - IRD - UAPV). This work will be done in close collaboration with CIBEST (Chemistry Interface Biology for Environmental Health and Toxicology Team, UMR SyMMES CEA - CNRS - UGA) in Grenoble (France), CEREGE near Aix-en-Provence (France), and more occasionally in relation with the Experimental Toxicology unit (INERIS, Verneuil en Halatte), as well as with the "case studies" partners supplying nanomaterials whose genotoxicity is to be documented.

Project content:

The mission entrusted to the candidate is part of the transversal project TILT (Toxicology Transverse to case-studies) which is one of the research programs funded by Labex SERENADE. TILT project is transverse to several "case studies": Safetypaint, Saquado, Ecosun, Packaging, Agnanowires. In these different case studies, nanoparticles are involved in a safer-by-design process aimed at optimizing the properties of the final material while reducing hazards and risks related to health and environment.

The aim of the TILT project is to develop high-throughput screening protocols for the cyto-genotoxic effects of nanomaterials and their transformation products, based on a limited number of nanoproducts (maximum 5) coming from the Safetypaint project. Once developed, these methods would be applied to 3 nanoproducts from each "case study".

The first step is to implement the in vitro PIG-A gene mutation test on a model of human blood cells; the choice of the cell type consists in the first phase of the development. The flow cytometry analysis will take place within the AMUTICYT platform (VRCM, UMR AMU INSERM). This PIG-A methodology will be carried out in conjunction with cytotoxicity studies and genotoxicity studies based namely on a High Content Analysis approach carried out by the CIBEST team (in vitro tests of comets and micronuclei, γ H2aX foci scoring). In a second step, 2 to 3 nanoparticles from each of the "case studies" will be selected for their genotoxic evaluation. This is an ambitious research program that namely aims to develop an in vitro gene mutation test based on an analysis of the frequency of GPI deficient cells (ie cells harboring a mutated PIG-A gene) by flow cytometry. The high-content analysis strategy of primary lesions of DNA (comets, γ H2aX), gene mutations (PIG-A) of chromosomal mutations (micronuclei) should be designed as a main tool in predictive toxicology but also as close as possible of regulatory toxicology testing. The goal is to produce a methodology to propose an ecodesign strategy during the development of nanomaterials.

The overall project has different tasks:

- Characterization of ecodesigned nanoparticles and their behavior in a biotic environment;
- Implementation of high throughput genotoxicity studies implying flow cytometry
- Validation of methodologies on some nanoparticles from each "case study"

In this context, the candidate will support the following tasks:

- Implementation of the in vitro PIG-A gene mutation test in human cells;
- Selection of nanoproducts in agreement with researchers from different "case studies";
- Performing various cyto-genotoxicity tests on the selected nanoproducts and cell models.
- Working in close relation with the studied carried out at CIBEST or subcontracted to the Experimental Toxicology Unit of INERIS

Responsibilities:

Technical project management (conducting experiments, summary results, missions between the partners)

Presentation of results (workshops, conferences)

Writing Papers

Candidates profil:

PhD graduate.

Working in conjunction with partners.

Knowledge of cellular and genetic toxicology, cell biology - very good experience in cell culture and in flow cytometry.

Experienced in handling (nano)particles and exposure of cells to particles

Experience in writing publications

Qualities: independence, scientific rigor, strong communication skills

To apply to this position:

Please send your application by mail only (CV, cover letter and two letters of recommendation) to T. Orsière.

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Keywords: nanoparticles, toxicology, genotoxicity, cell culture, flow cytometry