Postdoctoral Position in Plasmonic Nanomaterials for Disease Diagnostics

Offer Description

The LCP-A2MC laboratory at the University of Lorraine invites applications for a 12-month postdoctoral research position to work on a project that aims to develop innovative hybrid Mg-ZnO nanomaterials for the early and cost-effective diagnosis of diseases.

The successful candidate will be at the heart of a multidisciplinary project that combines materials science, nanotechnology, and biomedical applications. The core of the project is to replace expensive gold-based plasmonic sensors with more economical and efficient Mg-ZnO nanostructures. These novel nanomaterials have demonstrated a 500-fold reduction in production cost while exhibiting excellent electromagnetic enhancement for Surface-Enhanced Raman Scattering (SERS) signals, enabling ultra-sensitive detection of disease biomarkers down to the femtomolar (10^{-15} mol/L) level.

The postdoctoral researcher will be responsible for:

- **Synthesizing and optimizing** functionalized Mg-ZnO hybrid nanostructures for the specific detection of Alzheimer's biomarkers (e.g., tau and amyloid-beta proteins).
- **Performing in-depth characterization** of the nanomaterials using a variety of techniques, including Transmission Electron Microscopy (TEM), Scanning Electron Microscopy (SEM), X-ray Diffraction (XRD), X-ray Photoelectron Spectroscopy (XPS), and SERS.
- **Conducting analytical validation** of the diagnostic platform using real biological samples (serum, saliva) in collaboration with the CHR Metz-Thionville.
- Contributing to the **development of a portable diagnostic device prototype** suitable for use in local medical practices and laboratories.

This is a unique opportunity to contribute to a project with significant societal impact, aiming to improve healthcare in the region and to participate in a pre-maturation phase of a start-up creation.

Researcher Profile

Required Skills and Qualifications

- A PhD in Materials Science, Chemistry, Physics, or a related field.
- **Essential expertise** in the **synthesis and characterization of nanomaterials**.
- Proven experience in **plasmonics** and **Surface-Enhanced Raman Scattering (SERS)** is highly desirable.
- Knowledge of bio-functionalization of nanoparticles would be a significant advantage.
- Strong publication record in relevant peer-reviewed journals.
- Excellent communication skills in English (both written and spoken).

- Ability to work independently and as part of a collaborative team.

Organisation/Institute

The position is based at the **LCP-A2MC (Laboratoire de Chimie et Physique - Approche Multi-échelles des Milieux Complexes)** at the **University of Lorraine** in Metz, France. The LCP-A2MC is a dynamic research environment with a strong focus on complex materials. The project is led by Dr. Suzanna AKIL, a recognized expert in plasmonic nanomaterials for detection.

The project involves close collaboration with the Institut Jean Lamour (IJL) and the Laboratoire de Nanotechnologie et d'Instrumentation Optique (L2N-UTT).

How to Apply

Interested candidates should send the following documents (in a single PDF file) to Dr. Suzanna AKIL (suzanna.akil@univ-lorraine.fr):

1. A detailed CV, including a list of publications.
2. A cover letter explaining their motivation and suitability for the position.
3. The names and contact details of at least two academic referees.

Application deadline: [February 20 2026]

Starting date: As soon as possible.