



## PhD offer: “design of *in vivo* self-assembled gold nanoclusters for biophotonic applications”

Atomically precise metal (gold, silver, platinum) clusters represent a promising family of ultra-small theranostic agents for the diagnostic and the treatment of many diseases such as cancer, neurological or cardio-vascular pathologies. One of the unique properties of these agents is based on the strong photo-physical changes when they self-assemble which can be exploited to monitor them at the cellular and animal levels.

In the **SEQUOIA** project funded by the ANR, we intend to design *in vivo* controlled assemblies of atomically precise gold nanoclusters (AuNCs) using short polymer chains and to investigate the structural and photophysical properties of these new nanosystems in solution, in microfluidic devices and in mice models.

In this context, the work of the PhD student will encompass the preparation of AuNCs and the generation of Au NC assembly with polymers by click chemistry. Morphology, size and optical properties will be assessed by spectroscopic and microscopy techniques in solution and on solid surface. The formation, the localization and the fate of such self-assemblies will be then investigated in cellular environment using advanced optical microscopy instruments. Based on the results, a microfluidic device mimicking the blood vessels will be used to validate the ability to generate the self-assembly of the AuNCs specifically on endothelial cells under flow.

The candidate will work in a multidisciplinary environment with chemists, biologists and engineers. The PhD thesis is taking place at Chimie du Département Moléculaire (University of Grenoble Alpes) for the chemistry side and the Institute for Advanced Biosciences for the biological side both located at closed distance in Grenoble (France).

**Duration:** 3 years    **Starting date:** January 2023    **Location:** Grenoble, France

### **Applicant profile:**

We are looking for a motivated and enthusiastic student that should have background in fields related to nanochemistry/biotechnology. Skills in spectroscopy, surface sensing and bioimaging will be a plus but is not mandatory.

### **Application:**

The candidate should send a cover letter, Cv, grade transcripts, and recommendation letters to Dr. Jean-luc Coll, Dr. Didier Boturyn, and Dr. Xavier Le Guével.

If you have any further question, do not hesitate to contact us:

Jean-luc Coll : [jean-luc.coll@univ-grenoble-alpes.fr](mailto:jean-luc.coll@univ-grenoble-alpes.fr)

Didier Boturyn : [didier.boturyn@univ-grenoble-alpes.fr](mailto:didier.boturyn@univ-grenoble-alpes.fr)

Xavier Le Guével : [xavier.le-guevel@univ-grenoble-alpes.fr](mailto:xavier.le-guevel@univ-grenoble-alpes.fr)