



## **Post-doc Position - Crystallization of active pharmaceutical ingredients (APIs) in confined media (CONFIN\_API project)**

Project manager: Dr. Gabin GBABODE

Host Institution / Laboratory: Université de Rouen Normandie (Mont-Saint-Aignan, France) / Laboratoire Sciences et Méthodes Séparatives UR 3233

Net salary per month: 2357.63 €

Contract duration / start date: 1 year (possibly renewable for 1 year) / October 2023

In the framework of the **CONFIN\_API** project funded by Région Normandie, a **1 year post-doctoral position** (possibly renewable for 1 year) is available in the Laboratory Sciences et Méthodes Séparatives (SMS) at Université de Rouen Normandie (Rouen, France), starting from October 2023.

The SMS laboratory is worldwide known for its expertise on the crystallization of low molecular weight molecules of high added value (drug molecules, inorganic materials, ...). This expertise lies on an in-depth understanding of the fundamentals of crystallization (nucleation and growth theories) together with the extensive use of phase diagrams to control the crystallization outcome. Some representative research topics of the laboratory include chiral separation of active pharmaceutical ingredients (APIs) by crystallization methods, the study of the polymorphism of several organic compounds and the development of innovative instrumentation (see the [laboratory website](#) for more details).

The **CONFIN\_API** project aims at widen the research area of the laboratory to crystallization of APIs in confined media. Indeed, the control of polymorphism, which is defined as the ability of a compound to crystallize in several crystal arrangements depending on the external conditions, is crucial in the development of APIs, since each polymorph possesses its own chemical and physical properties. In particular, solubility and dissolution rates of polymorphs are of special interest since they directly influence the bioavailability of the final drug product. In this prospect, metastable polymorphs are particularly interesting since they are more soluble than the more stable polymorph. On the other hand, those polymorphs will tend to convert with time into the most stable polymorph, potentially yielding to dramatic situations such as Ritonavir. The idea of the CONFIN\_API project is to make use of confined media (thin films, nanoporous particles) to modify the phase thermodynamics and “stabilize” metastable polymorphs. The strategy is to use thin films (film thickness of hundreds of nm and less) as a model confinement geometry (1D confinement) to study the polymorphism of various APIs. These films will be characterized by conventional characterization techniques available in the laboratory (X-ray powder diffraction, AFM, Polarized Optical Microscopy) together with more specific ones available through collaborations and/or synchrotron facilities (X-ray reflectivity, Grazing incidence X-ray diffraction). A second part of the project, will aim at transferring the knowledge acquired with thin films to the integration of APIs into nano-porous particles (like porous silica or porous polymer matrixes) to get a deeper understanding of the influence of 3D confinement on the polymorphism of APIs and use it for the stabilization of metastable polymorphs and the subsequent design of innovative robust drug formulations.

We seek for a talented and motivated young researcher with a **PhD in crystallization of organic molecules**. He / she should have strong knowledge on phase thermodynamics, crystallography and on X-ray diffraction techniques (theoretical and applied). An experience in the elaboration and / or characterization of surfaces / interfaces would be a plus. The candidate should be hard working, open-minded, rigorous and possess strong laboratory skills. He / she will have to be fluent in English and able to write high-quality research papers and draft patents.

Applications (Curriculum Vitae, motivation letter, list of publications, electronic copies of the Master and Thesis diploma, name and email address of 3 reference persons) should be sent to [gabin.gbabode@univ-rouen.fr](mailto:gabin.gbabode@univ-rouen.fr).