

Recruitment of a post-doctoral researcher

Functionalized magnetic nanoparticles for the capture of microRNA, and their release by hyperthermia in microfluidics devices, H/F.

<https://bit.ly/3hhbtrR>

The laboratories C2N (CNRS UMR 9001) at Paris-Saclay University, PHENIX (CNRS UMR 8234) at Sorbonne University in Paris and IRBA (INSERM UMRS-MD 1197) in Clamart seek a post-doctoral researcher.

The research project will start on October 1st 2020 and the postdoctoral researcher will be funded for a period of 18 months thanks to the financial support of Labex NanoSaclay (e-miRgency project) and ANR (DIMELEC project).

The post-doctoral researcher will be supervised by Dr Jean Gamby (C2N), Dr J.-M. Siaugue (PHENIX) and Dr Sébastien Banzet (IRBA).

Research project and objectives:

The research project aims at developing an analysis and detection platform to capture microRNA and then release them by magnetic hyperthermia to detect them on a network of functionalized microelectrodes. The post-doctoral researcher will be involved in the synthesis of core-shell magnetic nanoparticles (MNPs), and in their functionalization for the capture and release of the miRNA. Different types of magnetic cores will be synthesized such as maghemite nanoparticles with diameter of about 12 nm, magnetite cores synthesized by a hydrothermal process with diameter around 150 nm, or magnetite nanorods of different sizes. After coating these cores with silica, the hybrid nanoparticles will be functionalized with DNA probes, with complementary sequences to the miRNA sequences targeted in the project. After capturing the miRNA, the MNPs will be submitted to an alternative magnetic field in order to produce heat at the surface of the MNPs and release the captured miRNA, which will be subsequently electrochemically detected in a microfluidics device bearing set of microelectrodes.

This project is thus at the interface between material chemistry (MNPs synthesis and functionalization), physics (magnetic properties, magnetic hyperthermia, microfluidics) and biology (treatment of biological samples to extract the miRNAs).

Host laboratory and infrastructures

The Biosys team of the MNBF (Microsystems and NanoBioFluidics) department of the C2N laboratory is internationally recognized in the field of micro/nanodevices fabrication and characterization, ranging from physical electro and/or mechanical microsystems to analytic micro/nanofluidic biodevices.

The CIN (Colloïdes INorganiques) team of the PHENIX laboratory is internationally recognized in the field of magnetic nanoparticles. The lab is fully equipped for the synthesis, the characterization and the functionalization of the MNPs.

The IRBA laboratory is dedicated to biomedical research in the field of trauma and regenerative medicine, and has a developed research programs in the field of miRNA as biomarkers of tissue injuries.

Applications

To be considered for this post-doctoral researcher position, the applicant must have completed his/her PhD in chemistry and material sciences by September 2020, and have previous experience with nanoparticles. Previous experience in biology would be also an asset. The candidate must have excellent communication skills in English (French would be appreciated but is not mandatory).

The candidate must provide:

- A CV with the names and contact information of two references
- A cover letter

Applications will be considered until July 31st 2020.

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