

Job profile: **Professor in Biochemistry and Nanosystem Engineering Teaching: Bachelor and Master levels**

Research field(s): **Biochemistry and Nanotechnology**

Applications and interviews : April-May 2012.

Contract Starting September 2012

Contact

Yves Gibon, DR2 INRA, yves.gibon@bordeaux.inra.fr, tél : 33-5 57 12 25 32 UMR1332 Biologie du Fruit et Pathologie
INRA Domaine de la Grande Ferrade 71 avenue Edouard Bourlaux BP 81 33883 VILLENAVE D'ORNON

Teaching profile

Large datasets are now generated by high-throughput technologies thanks to recent advances in cell biology, which include molecular analyses of cellular interaction networks. The interpretation of such datasets now requires the use of concepts of molecular and mechanistic enzymology. Presently, there is a lack of training opportunities for students in this emerging field of Biology. The recruitment is intended to bridge this gap and to provide training opportunities in nanobiotechnology that will benefit the entire Master program in Biology.

The recruited teacher will strengthen the existing teaching staff. An expertise in fields like mechanistic enzymology, modulation of metabolic fluxes, protein-protein interactions and signal transduction is essential. Enzymology is often perceived by students as too abstract. Thus, based on the analysis of data from actual experiments, the teacher will show how to develop predictive models. The functional behavior of proteins (enzymes, receptors) is now utilized to develop nanosensors and nanoreactors. This on growing field is a real source of opportunities for students. A student's awareness to these new enzymatic technologies is planned and skills of the candidate in this area would be a plus. The professor could propose to study the development of analytical biochemistry (e.g., biosensors, industrial enzymology) in a professional master (M1 and M2).

Research Project

The research unit of Fruit Biology and Pathology has set up platforms for imaging, transcriptomics and metabolomics federated by the Bordeaux Functional Genomics Center. These tools allow the processing of biological systems as a set of complex networks of genes, proteins and biochemical reactions. A major component of our strategy is based on a high throughput analysis of the data. By targeting some variables reflecting enzymatic activities or protein-protein interactions in a large number of samples (>100 000 assays per year), we can comprehensively approach biological processes such as host-pathogen interactions or tissue development and differentiation. In particular, the Bordeaux Metabolome platform hosts a facility dedicated to high throughput metabolic phenotyping which is unique in France. One of the current limitations is that increasing the throughput (number of processed samples) is at the expense of the density (number and quality of the measured variables). Consequently, a significant effort is required to develop automated analytic tools adapted to our specific needs which will include preparation, measurement and access to a large number of variables. Hence, the optimization of protein sensors for an high-throughput analyses or the adjustment of integrated predictive models over datasets is of central importance to our approach.

Research profile

With his expertise in enzymology and protein chemistry, the professor will develop a research activity at the interface of biochemistry and nanotechnology. He/She will develop predictive models from experimental data sets and will stimulate the design of new proteic sensors to circumvent technological obstacles limiting the number of variables that can be measured in parallel in large numbers of samples. He/She should contribute to the development of the next generation of tools for biochemical phenotyping combining high density and high throughput. The applicant must have demonstrated its openness to interdisciplinarity required for the project. Actively collaborating with the biologists in the field, he/she should mobilize and develop the local resources and federate researches around systems biology projects. It is expected that he/she will insert the collective in European projects.