

Project:

The teams “Dynamic of receptor organization in neuronal membranes” and “Quantitative Imaging of the Cell” at the laboratory Cellular Physiology of the Synapse in Bordeaux (France) have one position opening for a PhD student.

The PhD project is developed in the framework of European network, SyMBaD (Synapse: from Molecules to higher Brain function And Diseases) and in partnership with an industrial collaborator. The aim is to set up an innovative fast multiphoton imaging technique which will allow imaging of thick biological samples at the single molecule level. This technique will be applied to study the movement of receptors in live neurons, in brain slices. The setup will be designed to be versatile in order to implement, on the same microscope, multiphoton SPT-PALM (Single Particle Tracking & PhotoActivation Localization Microscopy) and SIM (Structured Illumination Microscopy) techniques.

Scientific Environment:

The “Quantitative Imaging of the Cell” is a newly created team, headed by Jean-Baptiste Sibarita, which develops new advanced cellular imaging techniques with the goal to monitor the dynamic of biological compartments at high spatial and temporal resolutions. Other related projects also being developed are FRAP (Fluorescence Recovery After Photobleaching), SPT-PALM (in 2 and 3 dimensions) and SIM. In addition to instrumental development, the team also develops software solutions for image processing and analysis, as well as instrumentation for micropatterning and microfluidics to control cell shape and chemical environment.

The team “Dynamic of receptor organization in neuronal membranes”, headed by Daniel Choquet, aims at understanding the role of glutamate receptor trafficking in controlling synaptic transmission in health and disease. It has developed and applied in the last decade a series of single molecule tracking approaches to image receptor diffusion in live neurons (e.g. Borgdorff & Choquet, *Nature*, 2002; Triller and Choquet, *Neuron*, 2008). Recently, the team has associated imaging and electrophysiological approaches to uncover a new unsuspected role of glutamate receptor fast diffusion in controlling information processing in the brain (Heine & al., *Science* 2008). The next challenge lies in imaging receptor trafficking in 3D in brain slices and to associate this with the analysis of receptor trafficking in vivo.

The SyMBaD network comprises 33 teams from 6 academic centers (Bordeaux, Alicante, Milan, Geneva, Göttingen, Bristol) representing an important fraction of the leading European researchers in the field. The teams are internationally recognized, highly qualified and in many cases employ cutting-edge technologies and emergent techniques.

The industrial collaborator is Amplitude Systèmes, a French company which develops femtosecond oscillator for life science.

Environment: Bordeaux is located in South West of France (3h from Paris by train). This charming town, near the Atlantic Ocean, has a city center which is world heritage of the UNESCO.

Qualification:

The candidate should be a non French citizen, and preferentially be originally from one of the European Union countries. He or she should have a physics background and a strong interest in the treatment of biological questions. Important for work in the lab is the ability to build optical instrumentation, and to write programs that control the setup and automate the data acquisition. Masters or equivalent degree is required.

To apply, send a complete CV, a motivation letter, and the names and addresses of two referees for letters of recommendation to:

Daniel Choquet

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and

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For further details on the Cellular Physiology of the Synapse, please visit our website:

<http://www.synapse.u-bordeaux2.fr/equipechoquet.htm>