

## Awarded Projects 2008-2009 Competition



### Multiplexed biosensors for identifying and monitoring cellular events associated with drugs therapeutic efficacies and side effects

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Hormones and neurotransmitters bind and activate receptors at the cell surface to initiate complex sets of intracellular signals which lead to an appropriate physiological response. Most drugs on the market target a large family of G protein coupled receptors (GPCRs). However, the tools to study the intricate signalling networks engaged by this important class of receptors are still not available.

Our project aims to develop a set of biosensors to address the technical challenge of monitoring the multiple signalling pathways engaged by GPCRs upon ligand binding. With these tools, it will be possible to establish a signalling signature for many different mediators such as reference compounds and candidate drugs.

Access to this kind of information will greatly improve the drug discovery process. As a proof of principle of these signatures, we will attempt to correlate the specific signatures of different betablockers with their reported side effects and their therapeutic efficacies in the treatment of cardiovascular diseases. The new biosensors and bioinformatics tools created by this project will help to better understand the complex nature of GPCR signalling and should prove invaluable for the development of new drugs by targeting signalling pathways specifically linked to their therapeutic benefits, while avoiding others linked to undesirable side effects.

#### **Co-investigators:**

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