Séminaire de l'unité de recherche de l'institut du thorax

Vendredi 20 octobre 2017 – 11h30 – Amphi DE

Artificial ligand-gated ion channel created by fusion of G protein-coupled receptors to a potassium channel

Christophe Moreau, PhD

Chargé de Recherche CR1 CNRS, Institut de Biologie Structurale
UMR5075 CEA-CNRS-UGA, GRENOBLE - www.ibs.fr

Abstract

Inspired by the natural example of KATP channels in which a "receptor" (SUR) directly regulates the activity of an ion channel (Kir6.2), we have developed the concept of Ion-Channel Coupled Receptors (ICCRs). ICCRs are created by the physical and functional coupling of the inward rectifier potassium channel Kir6.2 to a G-protein coupled receptor (GPCR). The ion channel serves as an electrical reporter of ligand binding to the receptor allowing the real-time detection of agonists and antagonists by simple current recordings.

The ICCR concept has been validated with several GPCRs, and since their discovery in 2008, progress has been made to understand their molecular mechanisms and to develop potential applications. The ability to tune the sign of the signal by protein engineering, the identification of critical residues by functional mapping and an application for the characterization of G protein-"uncoupled" receptors will be presented.

Those results will give an overview of the potential interest of the ICCR technology for both basic science and applied research.