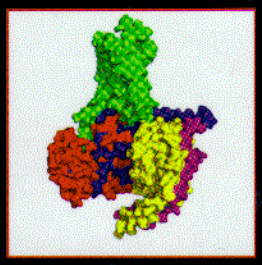
G Protein-Coupled Receptors



Signaling, Trafficking and Regulation

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In this volume of Methods in Cell Biology, we cover multiple aspects of G protein-coupled receptor (GPCR) signaling, trafficking, regulation, and cellular assays in a form of either an overview or as step-by-step protocol. This is an effort to bring together different domains of GPCR pharmacology and signaling on to a common platform and highlight the incredibly versatile nature and diverse functional manifestation of GPCRs. Section I includes chapters on GPCR trafficking in lipid rafts and cilia, imaging endogenous receptor in neurons, single molecule imaging of GPCRs, and a comprehensive analysis of GPCRs in adipose tissue. In Section II, we cover topics ranging from GPCR signaling from endosomes, olfactory receptor signal transduction, studies of a specialized GPCR smoothened in zebrafish model, and the outcome of GPCR signaling in cytoskeletal dynamics. In recent years, a key focus area in GPCR biology has been the development of novel and more sensitive cellular assays to investigate GPCR expression, signaling, and downregulation. Section III of this volume is focused on GPCR assays which include classical radioligand binding; label-free; biosensor- and fluorescence-based approaches to study GPCR trafficking and signaling; and TANGO assay for measuring GPCR-beta-arrestin interaction. Finally, Section IV consists of chapters on structural and computational aspects of protease-activated receptors, bitter taste receptors, and GPCR dimerization.

KEY FEATURES

- Contributions from leading experts in this specialized field of research
- Methods and protocols for studying G Protein-Coupled Receptors in a wide range of model systems and techniques

Cover image: Putting a stop: Structural visualization of GPCR signaling termination. This figure represents the superimposition of a GPCR-G protein complex and a GPCR-arrestin protein complex. The GPCR component is shown in green and the arrestin component is in red. The subunits of the heterotrimeric G proteins are shown in blue (Gα), yellow (Gβ), and magenta (Gγ). This superimposition reflects the overlapping nature of G protein and arrestin binding sites in the GPCRs and therefore, explains the arrestin-mediated G protein signaling termination event of GPCRs.

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