G protein (heterotrimer) Biosensor

TECHNICAL NOTE

BioSens-All™

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The G protein (heterotrimer) biosensor is a multi-subunit BRET-based sensor that monitors protein-protein interaction changes occurring within the G protein heterotrimeric complex. Composed of a Gα subunit fused to the *R*Luc, a protein Gβ and a GFP-tagged protein Gγ subunit (Figure 1), in its inactive conformation, the heterotrimeric complex allows close proximity of the *R*Luc and GFP leading to a basal BRET signal. Upon receptor stimulation, the Gα subunit switches from a GDP to GTP-bound conformation and dissociates from the βγ subunits, leading to a significant loss in BRET signal (Figure 1-2). The use of different Gα-*R*Luc fusion proteins allows discrimination of the specific Gα protein engaged following receptor activation (Figure 2).

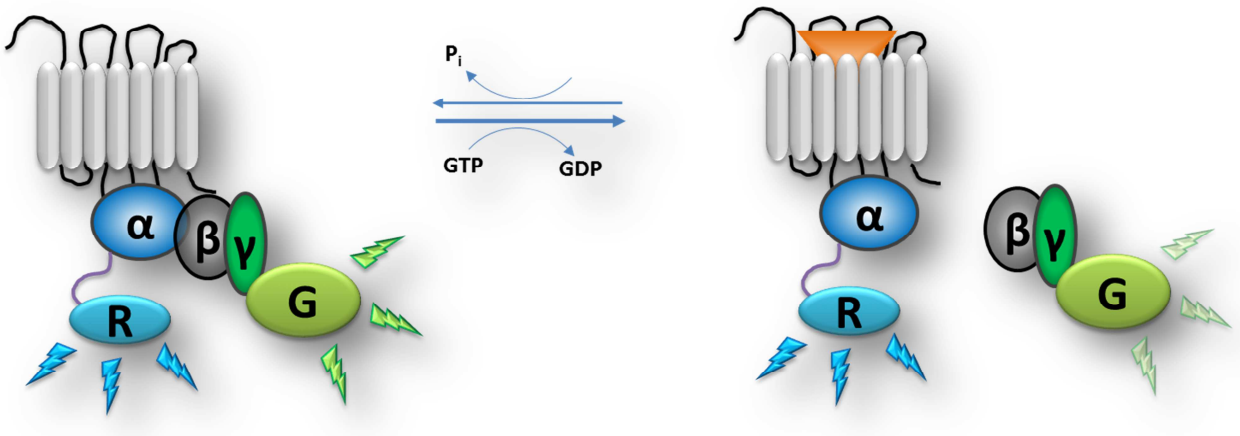

Figure 1. Structure of the BioSens-All™ G protein (heterotrimer) biosensor. R= *R*Luc, G= GFP, and orange= ligand (orthosteric or allosteric).

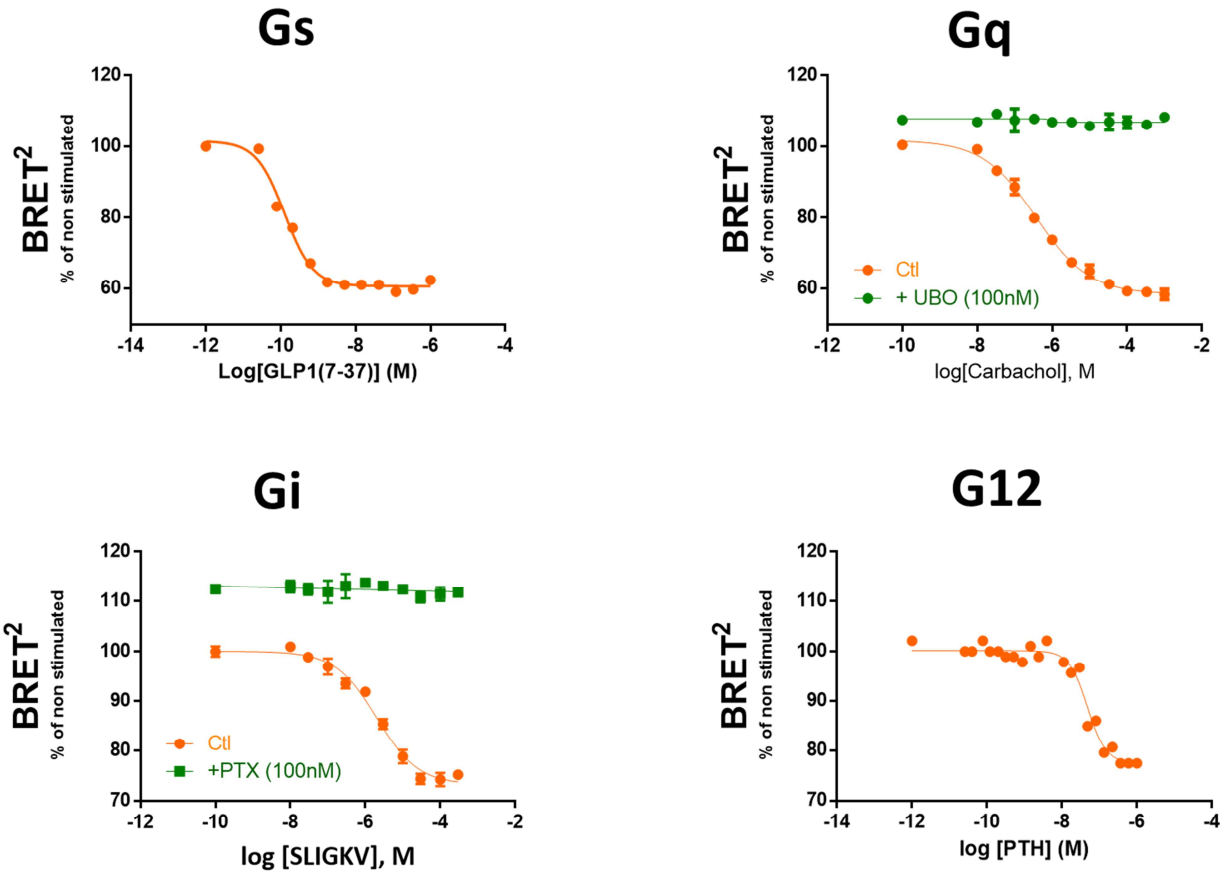

Figure 2. Detection of ligand-induced Gα protein activation in cells transiently overexpressing different GPCR and each Gα biosensor.

Gs GLP-1 receptor was co-transfected with the Gαs biosensor and stimulated with increasing concentration of GLP-1 (7-37). **Gq** Muscarinic M3 receptor was co-transfected with the Gαq biosensor and stimulated with increasing concentration of carbachol. The signal was blocked using UBO-QIC (FR900359, a selective Gαq inhibitor). **Gi** Protease PAR-2 receptor was co-transfected with the Gαi1 biosensor and stimulated by an increasing dose of SLIGKV peptide. The signal was blocked using overnight treatment with *pertussis toxin* (PTX), a selective Gαi family inhibitor. **G12** Parathyroid hormone 1 receptor was co-transfected with Gα12 biosensor and stimulated by increasing concentration PTH peptide.