

Adhesion G protein-coupled receptors

Adhesion G protein-coupled receptors (adhesion GPCRs) are a subgroup of the G protein-coupled receptor family, which is one of the largest families of cell surface receptors. Adhesion GPCRs are characterized by having a relatively large extracellular region with multiple protein domains involved in cell adhesion and interactions with the extracellular matrix.

Unlike other GPCRs that primarily transmit signals through G proteins, adhesion GPCRs have diverse signaling mechanisms that can involve G protein-dependent signaling, as well as G protein-independent signaling pathways. They have been implicated in a wide range of biological processes, including development, immune response, neuronal connectivity, and tissue homeostasis.

The extracellular domains of adhesion GPCRs contain various structural motifs, such as epidermal growth factor-like repeats, thrombospondin type-1 repeats, pentraxin repeats, and leucine-rich repeats. These domains enable adhesion GPCRs to interact with other cells or extracellular matrix components, facilitating cell-cell adhesion, cell-matrix interactions, and signal transduction events.

Adhesion GPCRs can have diverse functions depending on their tissue and cellular expression patterns. They have been implicated in processes such as neuronal migration, synaptogenesis, immune cell activation, and vascular development. Furthermore, mutations or dysregulation of adhesion GPCRs have been associated with several diseases, including cancer, neurodevelopmental disorders, and cardiovascular diseases.

Given their unique structural and functional characteristics, adhesion GPCRs represent an intriguing area of research. Scientists continue to study their roles and signaling mechanisms to better understand their contributions to normal physiology and disease pathogenesis.

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