

Adhesion G protein-coupled receptor

Adhesion **G protein coupled receptors** (adhesion GPCRs) are a class of 33 human protein receptors with a broad distribution in embryonic and larval cells, cells of the reproductive tract, neurons, leukocytes, and a variety of tumours.

Adhesion GPCRs are found throughout metazoans and are also found in single-celled colony forming choanoflagellates such as *Monosiga brevicollis* and unicellular organisms such as *Filasterea*. The defining feature of adhesion GPCRs that distinguishes them from other GPCRs is their hybrid molecular structure. The extracellular region of adhesion GPCRs can be exceptionally long and contain a variety of structural domains that are known for the ability to facilitate cell and matrix interactions. Their extracellular region contains the membrane proximal GAIN (GPCR-Autoproteolysis INducing) domain. Crystallographic and experimental data has shown this structurally conserved domain to mediate autocatalytic processing at a GPCR-proteolytic site (GPS) proximal to the first transmembrane helix. Autocatalytic processing gives rise to an extracellular (α) and a membrane-spanning (β) subunit, which are associated non-covalently, resulting in expression of a heterodimeric receptor at the cell surface.

Ligand profiles and in vitro studies have indicated a role for adhesion GPCRs in cell adhesion and migration.

Work utilizing genetic models confined this concept by demonstrating that the primary function of adhesion GPCRs may relate to the proper positioning of cells in a variety of organ systems. Moreover, growing evidence implies a role of adhesion GPCRs in tumour cell metastases.

Formal G protein-coupled signalling has been demonstrated for a number for adhesion GPCRs, however, the orphan receptor status of many of the receptors still hampers full characterisation of potential signal transduction pathways. In 2011, the adhesion GPCR consortium was established to facilitate research of the physiological and pathological functions of adhesion GPCRs.

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