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The effects of RAMPs upon cell signalling

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Abstract

G protein-coupled receptors (GPCRs) play a vital role in signal transduction. It is now clear that numerous other molecules within the cell and at the cell surface interact with GPCRs to modulate their signalling properties. Receptor activity modifying proteins (RAMPs) are a group of single transmembrane domain proteins which have been predominantly demonstrated to interact with Family B GPCRs, but interactions with Family A and C receptors have recently begun to emerge. These interactions can influence cell surface expression, ligand binding preferences and G protein-coupling, thus modulating GPCR signal transduction. There is still a great deal of research to be conducted into the effects of RAMPs on GPCR signalling; their effects upon Family B GPCRs are still not fully documented, in addition to their potential interactions with Family A and C GPCRs. New interactions could have a significant impact on the development of therapeutics

Keywords

Receptor activity modifying protein, G protein-coupled receptor, signalling, trafficking, coupling.

Abbreviations

AM, adrenomedullin; AMY, amylin; CaSR, calcium-sensing receptor, CGRP, calcitonin gene-related peptide; CHO, chinese hamster ovary; CLR, calcitonin receptor-like receptor; CT, calcitonin; CTR, calcitonin receptor; CRF, corticotrophin releasing factor; ECD, extracellular domain; ECL, extracellular loops; GCGR, glucagon receptor; GLP, glucagon-like peptide; GLP, GLP2R, glucagon-like peptide receptor 2; GPCR, G protein-coupled receptor; GPR30, G protein coupled estrogen receptor 1; GRKs, G protein-coupled receptor kinases; h, human; HEK, human embryonic kidney; m, mouse; NHERF-1, Na⁺/H⁺ exchanger regulatory factor-1; PTX, pertussis toxin; PTH, parathyroid hormone; PTHR, parathyroid hormone receptor; PTHrP, parathyroid hormone related peptide; r, rat; RAMP, receptor activity modifying protein; s, salmon; VPAC, vasoactive intestinal peptide.

1. Introduction

In order to communicate and respond to their surrounding environment, cells utilise a vast array of signalling molecules ranging from neurotransmitters,

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