Adenylyl cyclases (ACs) in GtoPdb v.2023.1

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Abstract

Adenylyl cyclase, E.C. 4.6.1.1, converts ATP to cyclic AMP and pyrophosphate. Mammalian membrane-delimited adenylyl cyclases (nomenclature as approved by the NC-IUPHAR Subcommittee on Adenylyl cyclases [11]) are typically made up of two clusters of six TM domains separating two intracellular, overlapping catalytic domains that are the target for the nonselective activators Gαs (the stimulatory G protein α subunit) and forskolin (except AC9, [28]). adenosine and its derivatives (e.g. 2',5'-dideoxyadenosine), acting through the P-site, are inhibitors of adenylyl cyclase activity [35]. Four families of membranous adenylyl cyclase are distinguishable: calmodulin-stimulated (AC1, AC3 and AC8), Ca²⁺ and Gβγ-inhibitable (AC5, AC6 and AC9), Gβγ-stimulated and Ca²⁺-insensitive (AC2, AC4 and AC7), and forskolin-insensitive (AC9) forms. A soluble adenylyl cyclase (AC10) lacks membrane spanning regions and is insensitive to G proteins. It functions as a cytoplasmic bicarbonate (pH-insensitive) sensor [7].

Contents

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Database links

Adenylyl cyclases (ACs)
https://www.guidetopharmacology.org/GRAC/FamilyDisplayForward?familyId=257
Enzymes
AC1(adenylyl cyclase 1)
https://www.guidetopharmacology.org/GRAC/ObjectDisplayForward?objectId=1278
References


36. Watson PA, Krupinski J, Kempinski AM and Frankenfield CD. (1994) Molecular cloning and characterization of the type VII isoform of mammalian adenylyl cyclase expressed widely in mouse...


