A2PE hydrolyses to A2E

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Introduction

Reactome is open-source, open access, manually curated and peer-reviewed pathway database. Pathway annotations are authored by expert biologists, in collaboration with Reactome editorial staff and cross-referenced to many bioinformatics databases. A system of evidence tracking ensures that all assertions are backed up by the primary literature. Reactome is used by clinicians, geneticists, genomics researchers, and molecular biologists to interpret the results of high-throughput experimental studies, by bioinformaticians seeking to develop novel algorithms for mining knowledge from genomic studies, and by systems biologists building predictive models of normal and disease variant pathways.

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Literature references


Reactome database release: 73

This document contains 1 reaction (see Table of Contents)
A2PE hydrolyses to A2E

Stable identifier: R-HSA-2466831

Type: transition

Compartments: cytosol, photoreceptor outer segment membrane

Diseases: dystrophies primarily involving the retinal pigment epithelium

The outer segment of photoreceptor cells is shed every 10-14 days to be completely replaced. The shed material is phagocytosed and transferred to the retinal pigment epithelium (RPE). Dioretinoid-pyridinium-phosphatidylethanolamine (A2PE) can be hydrolysed to dioretinoid-pyridinium-ethanolamine (A2E), a prominent constituent of lipofuscin (the material deposited in retinal tissue which accumulates over time and is implicated in macular degeneration). Evidence suggests this happens before transfer to RPE cells as part of the phagocytosed outer segment. A2E has been detected in outer segments (Ben-Shabat et al. 2002) and an N-acyl-phosphatidylethanolamine-hydrolyzing phospholipase D (NAPEPLD) activity detected in rat, mouse and human proteins (Okamoto et al. 2004, Ueda et al. 2005, Wang et al. 2006). This activity has been shown to hydrolyse A2PE to A2E in bovine outer segments before phagocytosis and transfer to RPE cells, suggesting A2PE is hydrolysed to A2E in photoreceptor outer segment membranes (Sparrow et al. 2003, Salvador & Giusto 1998).

Literature references


