ATP1A:ATP1B:FXYD binds cardiac glycosides

Jassal, B., Shoichet, BK.

European Bioinformatics Institute, New York University Langone Medical Center, Ontario Institute for Cancer Research, Oregon Health and Science University.

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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

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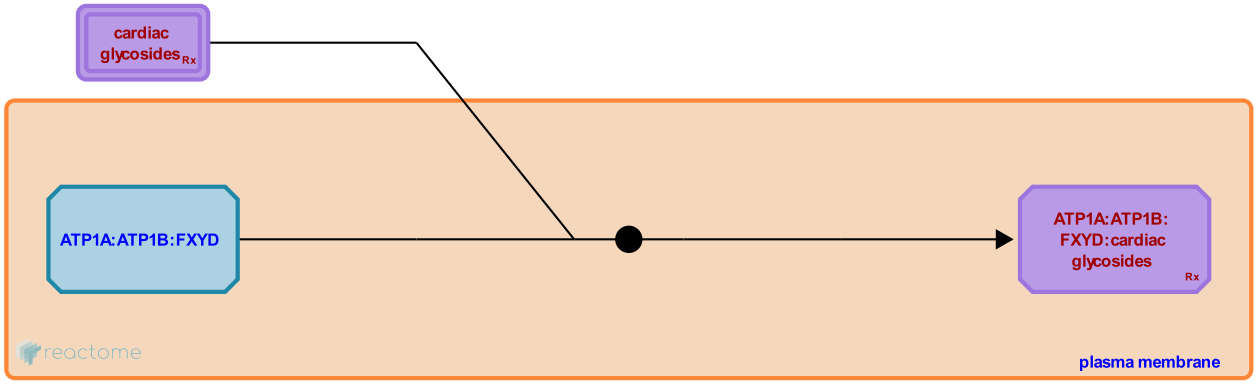
Stable identifier: R-HSA-9684068

Type: binding

Compartments: extracellular region, plasma membrane



Cardiac glycosides are a class of organic compounds that increase the output force of the heart and increase its rate of contractions by inhibition of the cellular sodium-potassium ATPase pump (ATP1A1). Their beneficial medical uses are as treatments for congestive heart failure and cardiac arrhythmias. Cardiac glycosides are primarily derived from foxglove plants or from the venom of the cane toad Bufo marinus. Their toxicity prevents them from being widely used. Changes to heart inotropic and chronotropic activity results in multiple kinds of dysrhythmia and potentially fatal ventricular tachycardia. Different cardiac glycosides show different specificities towards sodium-potassium ATPase pump alpha isoforms (Hauck et al. 2009, Katz et al. 2010, Cherniavsky et al. 2015).

HIV-1 Tat is essential for HIV-1 replication. Tat must escape from the cell in order for it to activate the HIV-1 LTR promoter and facilitate HIV-1 viral replication. Tat utilises the cellular ATP1A1 pump for secretion out of cells. The cardiac glycosides ouabain, digoxin, digitoxin, acetyldigitoxin and deslanoside can all inhibit ATP1A1 (Smith 1984), impairing extracellular Tat release and blocking HIV-1 replication (Agostini et al. 2017).

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Editions

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