Vitamin D (calciferol) metabolism

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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: 79

This document contains 1 pathway and 19 reactions (see Table of Contents)
Vitamin D (calciferol) metabolism

**Stable identifier:** R-HSA-196791

Vitamin D3 (VD3, cholecalciferol) is a steroid hormone that principally plays roles in regulating intestinal calcium absorption and in bone metabolism. It is obtained from the diet and produced in the skin by photolysis of 7-dehydrocholesterol and released into the bloodstream. Very few foods (eg. oily fish, mushrooms exposed to sunlight and cod liver oil) are natural sources of vitamin D. A small number of countries in the world artificially fortify a few foods with vitamin D. The metabolites of vitamin D are carried in the circulation bound to a plasma protein called vitamin D binding protein (GC) (for review see Delanghe et al. 2015, Chun 2012). Vitamin D undergoes two subsequent hydroxylations to form the active form of the vitamin, 1-alpha, 25-dihydroxyvitamin D (1,25(OH)2D). The first hydroxylation takes place in the liver followed by subsequent transport to the kidney where the second hydroxylation takes place. 1,25(OH)2D acts by binding to nuclear vitamin D receptors (Neme et al. 2017) and it has been estimated that upwards of 2000 genes are directly or indirectly regulated which are involved in calcium homeostasis, immune responses, cellular growth, differentiation and apoptosis (Hossein-nezhad et al. 2013, Hossein-nezhad & Holick 2013). Inactivation of 1,25(OH)2D occurs via C23/C24 oxidation catalysed by cytochrome CYP24A1 enzyme (Christakos et al. 2016).

**Literature references**


**Editions**

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Photolytic cleavage and thermal isomerization of 7-dehydroCHOL

Location: Vitamin D (calciferol) metabolism

Stable identifier: R-HSA-209754