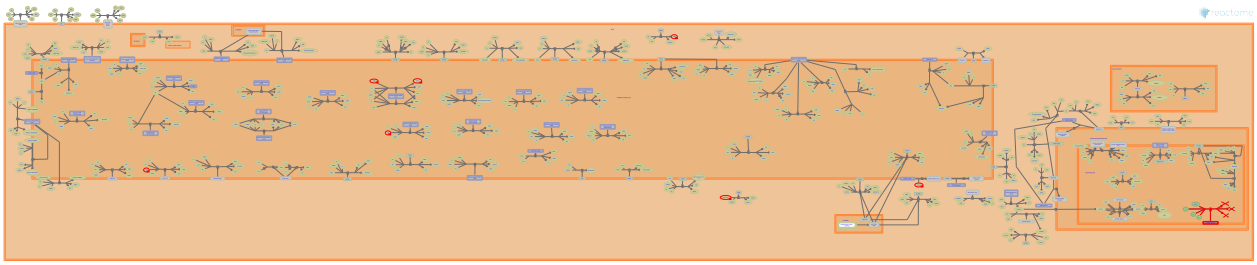
Defective CYP24A1 causes HCAI



Jassal, B., Nakaki, T.

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

06/05/2024

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

Fabregat, A., Sidiropoulos, K., Viteri, G., Forner, O., Marin-Garcia, P., Arnau, V. et al. (2017). Reactome pathway analysis: a high-performance in-memory approach. *BMC bioinformatics, 18*, 142. ↗

Sidiropoulos, K., Viteri, G., Sevilla, C., Jupe, S., Webber, M., Orlic-Milacic, M. et al. (2017). Reactome enhanced pathway visualization. *Bioinformatics, 33*, 3461-3467. ↗

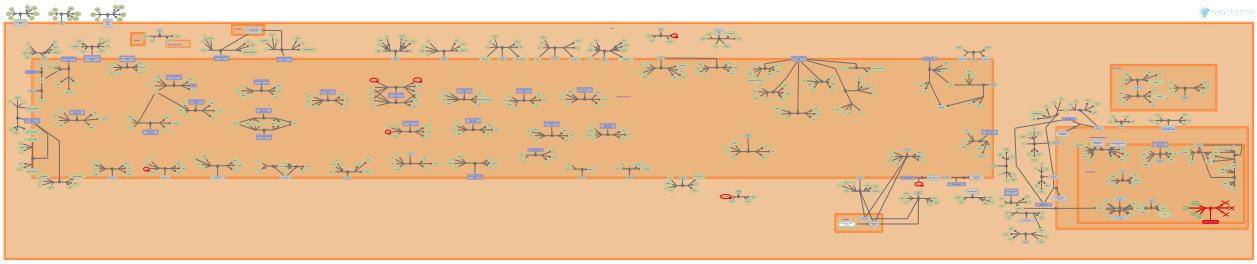
Fabregat, A., Jupe, S., Matthews, L., Sidiropoulos, K., Gillespie, M., Garapati, P. et al. (2018). The Reactome Pathway Knowledgebase. *Nucleic Acids Res, 46*, D649-D655. ↗

Fabregat, A., Korninger, F., Viteri, G., Sidiropoulos, K., Marin-Garcia, P., Ping, P. et al. (2018). Reactome graph database: Efficient access to complex pathway data. *PLoS computational biology, 14*, e1005968. ↗

Defective CYP24A1 causes HCAI ↗

Stable identifier: R-HSA-5579010

Diseases: hypercalcemia



Catabolic inactivation of the active, hormonal form of vitamin D3 (calcitriol, CALTOL, 1,25-dihydroxyvitamin D3) is initially carried out by 24-hydroxylation, mediated by 1,25-dihydroxyvitamin D3 24-hydroxylase (CYP24A1). The product formed is eventually transformed to calcitroic acid, the major water-soluble metabolite that can be excreted in bile. Defects in CYP24A1 can cause hypercalcemia infantile (HCAI; MIM:143880), a disorder characterised by abnormally high level of calcium in the blood, failure to thrive, vomiting, dehydration, and nephrocalcinosis (Schlingmann et al. 2011).

Literature references

Bindels, RJ., Hoenderop, JG., Fehrenbach, H., Irwin, A., Schlingmann, KP., Weber, S. et al. (2011). Mutations in CYP24A1 and idiopathic infantile hypercalcemia. *N. Engl. J. Med., 365*, 410-21. ↗

Editions

2014-06-06	Authored, Edited	Jassal, B.
2014-11-03	Reviewed	Nakaki, T.

Defective CYP24A1 does not 24-hydroxylate CALTOL ↗

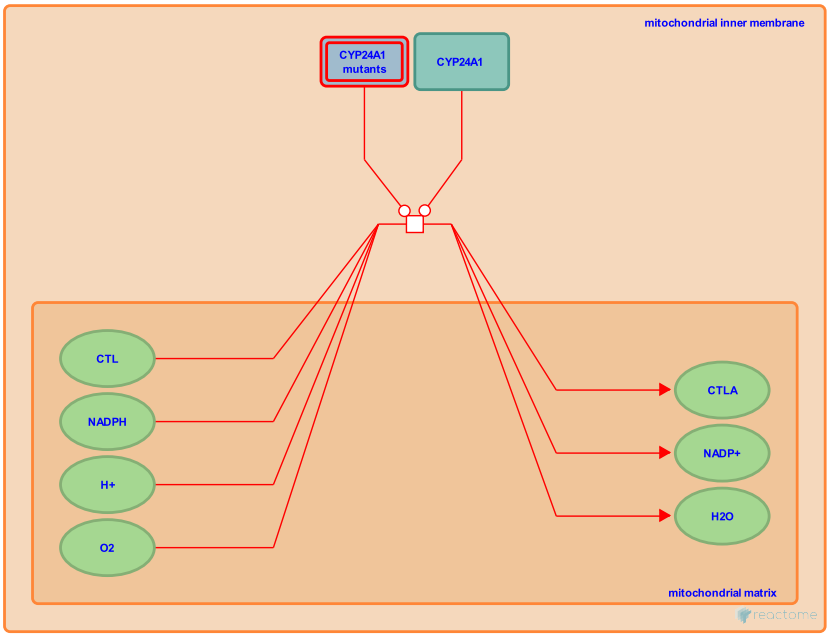
Location: Defective CYP24A1 causes HCAI

Stable identifier: R-HSA-5602004

Type: transition

Compartments: mitochondrial inner membrane, mitochondrial matrix

Diseases: hypercalcemia



Catabolic inactivation of the active, hormonal form of vitamin D3 (calcitriol, CALTOL, 1,25-dihydroxyvitamin D3) is initially carried out by 24-hydroxylation, mediated by 1,25-dihydroxyvitamin D3 24-hydroxylase (CYP24A1). The product formed is eventually transformed to calcitroic acid, the major water-soluble metabolite that can be excreted in bile. Defects in CYP24A1 can cause hypercalcemia infantile (HCAI; MIM:143880), a disorder characterised by abnormally high level of calcium in the blood, failure to thrive, vomiting, dehydration, and nephrocalcinosis. CYP24A1 mutations causing HCAI include C477Lfs*14, E143del, E151*, R159Q, R396W and E322K (Schlingmann et al. 2011).

Literature references

Bindels, RJ., Hoenderop, JG., Fehrenbach, H., Irwin, A., Schlingmann, KP., Weber, S. et al. (2011). Mutations in CYP24A1 and idiopathic infantile hypercalcemia. *N. Engl. J. Med., 365*, 410-21. ↗

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