CBR3 reduces DOX to DOXOL

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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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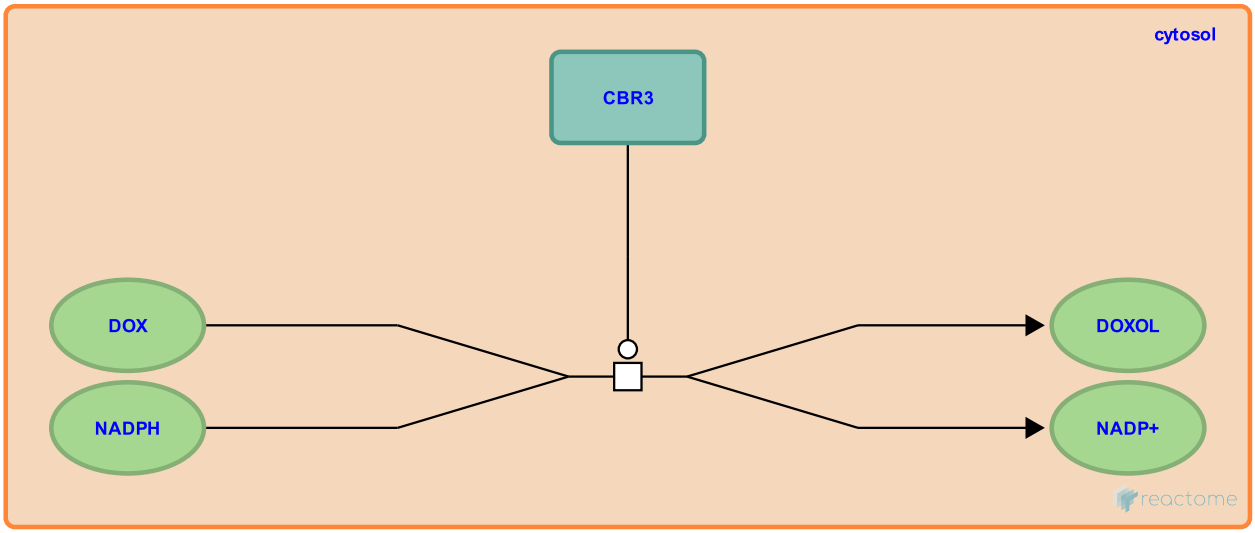
Stable identifier: R-HSA-8937419

Type: transition

Compartments: cytosol



The anthracycline doxorubicin (DOX, adriamycin) is a widely-used chemotherapeutic agent effective against a broad range of malignant neoplasms, including blood cancers, carcinomas, and sarcomas. Its use is dose-limited by off-target complications, namely cardiomyopathies. Doxorubicinol (DOXOL, adriamycinol), an alcohol metabolite of doxorubicin, has been implicated in the cardiotoxicity observed in doxorubicin-treated patients (Olson et al. 1998). In a mouse model, carbonyl reductase [NADPH] 3 (Cbr3) is able to catalyse the NADPH-dependent two-electron reduction of DOX to DOXOL but at a much lower efficiency than its well-characterised family member Cbr1 (Schaupp et al. 2015). Naturally occurring variants of human CBR3 can significantly alter anthracycline metabolism (Bains et al. 2010). Inhibition of CBRs may provide protection from doxorubicinol cardiotoxicity.

Literature references

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Editions

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