NO and NO2 react to N2O3

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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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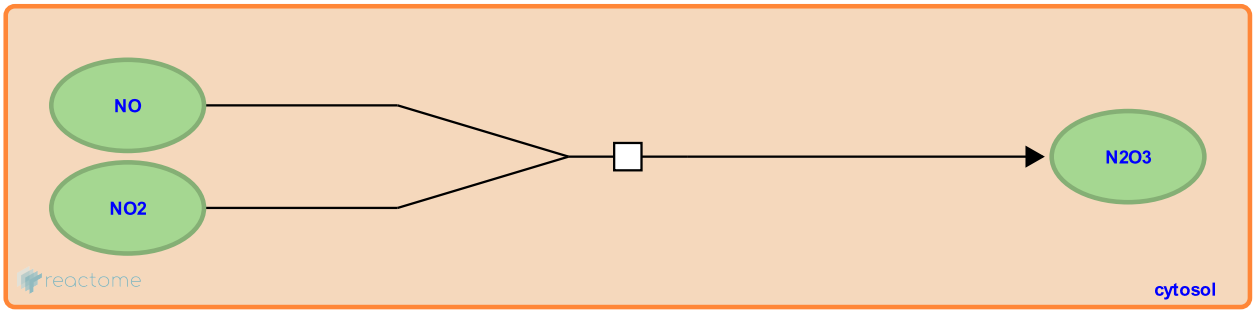
Stable identifier: R-HSA-6804006

Type: transition

Compartments: cytosol



NO2 reacts with NO to produce N2O3 .

Under normal physiological conditions, when the rates of nitric oxide (NO) production are low, NO can interact directly with biological molecules. Generally, these types of reactions may serve protective regulatory and/or anti-inflammatory functions (Hummel SG et al. 2006; Wink DA et al. 2001). High NO fluxes under pathological conditions enable formation of NO-derived reactive intermediates. The most prevalent NO-derived reactive species produced in vivo are dinitrogen trioxide (N2O3) and peroxynitrite (ONOO-), both of which can mediate additional nitrosative and/or oxidative reactions (Grisham MB et al. 1999; Wink DA & Mitchell JB 1998; Ali AA et al. 2013). N2O3 production requires oxidation of NO first to NO2 which will then combine with NO to form N2O3. Although this reaction is very slow at physiological levels of nitric oxide, it has been suggested that hydrophobic environments, such as those found in the cellular membrane, can accelerate this reaction (Liu X et al. 1997; Moller MN et al. 2007). N2O3 formation regulates the function of many target proteins through the coupling of a nitroso moiety (NO+) to a reactive cysteine, ultimately leading to the formation of RSNO, a process commonly known as S-nitrosylation (Broniowska KA & Hogg N 2012).

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Editions

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