OGG1beta G12E does not translocate to mitochondria

Boldogh, I., Orlic-Milacic, M., Vlahopoulos, S.

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

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. ↗

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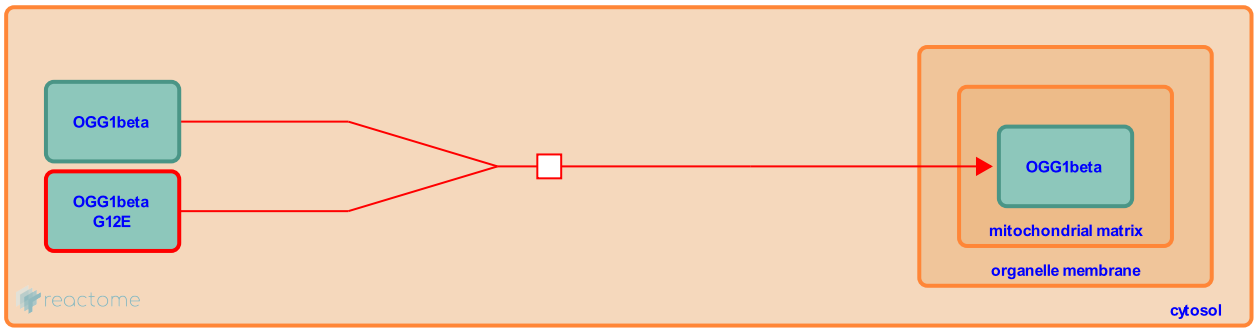
Stable identifier: R-HSA-9657051

Type: transition

Compartments: cytosol

Diseases: cancer



A missense mutation in OGG1, reported in kidney cancer, leads to substitution of glycine at position 12 with glutamic acid residue, disrupting the mitochondrial targeting sequence at the N-terminus of OGG1. OGG1beta G12E mutant is unable to translocate to the mitochondrion (Audebert et al. 2002). It is uncertain whether OGG1beta participates in the repair of 8-oxoguanine lesions in mitochondrial DNA. While some studies have reported DNA glycosylase activity of OGG1 beta (reviewed by Furihata 2015) and preservation of this activity in OGG1beta G12E mutant (Audebert et al. 2002), other studies have reported lack of DNA glycosylase activity in OGG1beta (Hashiguchi et al. 2004).

Literature references

Radicella, JP., Boiteux, S., Charbonnier, JB., Audebert, M. (2002). Mitochondrial targeting of human 8-oxoguanine DNA glycosylase hOGG1 is impaired by a somatic mutation found in kidney cancer. *DNA Repair (Amst.), 1*, 497-505. ↗

Editions

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