IL37(1-?) and IL37 (?-) dissocates from IL37(1-?):IL37(?-218):CASP1(120-197):CASP1(317-404)

Carriero, R., Duenas, C., Garlanda, C., Mantovani, A., Varusai, TM.

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

21/09/2024

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.
The development of Reactome is supported by grants from the US National Institutes of Health (P41 HG003751), University of Toronto (CFREF Medicine by Design), European Union (EU STRP, EMI-CD), and the European Molecular Biology Laboratory (EBI Industry program).

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. ↗

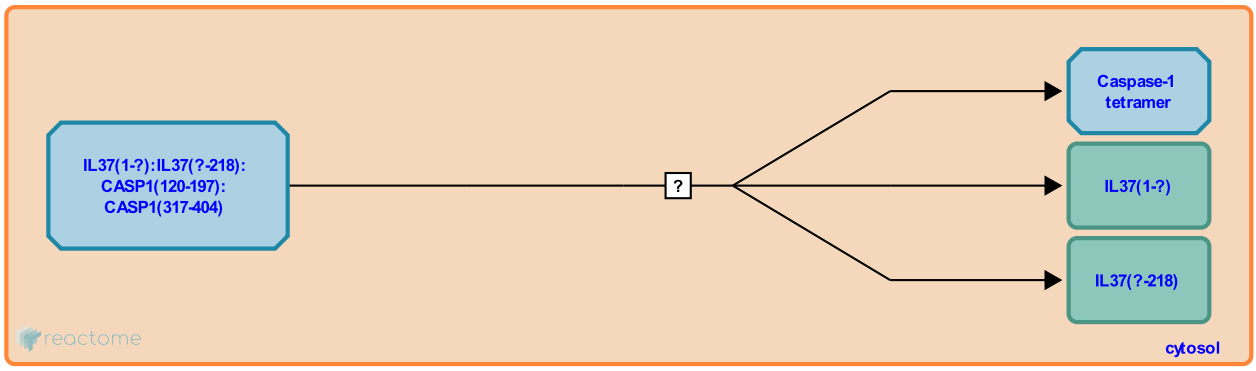
Fabregat, A., Korninger, F., Viteri, G., Sidiropoulos, K., Marin-Garcia, P., Ping, P. et al. (2018). Reactome graph database: Efficient access to complex pathway data. *PLoS computational biology, 14*, e1005968. ↗

IL37(1-?) and IL37 (?-) dissocates from IL37(1-?):IL37(?-218):CASP1(120-197):CASP1(317-404)

Stable identifier: R-HSA-9012689

Type: uncertain

Compartments: cytosol



Interleukins (IL) are immunomodulatory proteins that elicit a wide array of responses in cells and tissues. Interleukin 37 (IL-37, IL-1 F7) is a member of the IL-1 family. There are five isoforms of IL-37 (a-e) of which transcript IL-37b is known to be functional (Sharma et al. 2008). This isoform is represented in UniProt as the canonical form of IL-37 and in Reactome as the full length, unprocessed form of IL-37. Like several other IL-1 family members, IL-37 is synthesized as a precursor that requires processing (primarily by caspase 1) to attain full receptor agonist or antagonist function. The putative caspase 1 cleavage site is at aspartic acid 20 (Kumar et al. 2002). However, other truncation sites in IL-37 have been suggested (Pan et al. 2001). Once processed, Caspase 1 dissociates from the protein. Caspase 1 may not be the only enzyme responsible for IL-37 processing (Sharma et al. 2008). These events ultimately lead to suppression of cytokine production in several types of immune cells resulting in reduced inflammation. This is a black box event because the cleavage sites and the enzymes responsible for the processing of IL-37 are uncertain.

Literature references

Dinarello, CA., Sharma, S., Bufler, P., Reinhardt, D., Kim, SH., Gräf, R. et al. (2008). The IL-1 family member 7b translocates to the nucleus and down-regulates proinflammatory cytokines. *J. Immunol., 180*, 5477-82.

Filvaroff, E., Vandlen, R., Henzel, WJ., Pan, G., Risser, P., Yansura, D. et al. (2001). IL-1H, an interleukin 1-related protein that binds IL-18 receptor/IL-1Rrp. *Cytokine, 13*, 1-7.

Dinarello, CA., Bufler, P., Li, S., Rubartelli, A., Fink, M., Bulau, AM. et al. (2014). Role of caspase-1 in nuclear translocation of IL-37, release of the cytokine, and IL-37 inhibition of innate immune responses. *Proc. Natl. Acad. Sci. U.S.A., 111*, 2650-5.

Brigham-Burke, MR., Rieman, DJ., Kumar, S., Gambotto, A., Lotze, MT., Lehr, R. et al. (2002). Interleukin-1F7B (IL-1H4/IL-1F7) is processed by caspase-1 and mature IL-1F7B binds to the IL-18 receptor but does not induce IFN-gamma production. *Cytokine, 18*, 61-71.

Editions

2017-09-27	Edited	Varusai, TM.
2017-10-18	Authored	Duenas, C.
2017-11-02	Reviewed	Mantovani, A., Garlanda, C., Carriero, R.