

VTN binds integrins alphaVbeta1, alphaVbeta3, alpha3beta5, alphaIIbbeta3

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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. [↗](#)
- 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. [↗](#)

Reactome database release: 88

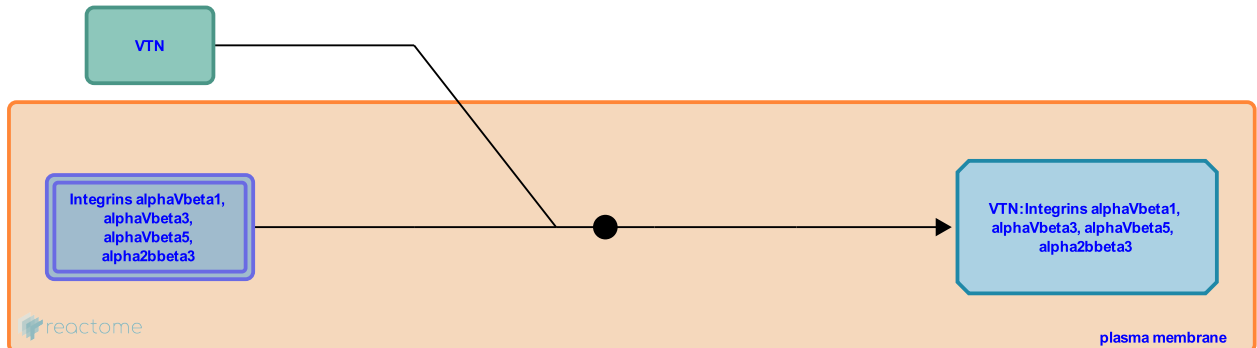
This document contains 1 reaction ([see Table of Contents](#))

VTN binds integrins alphaVbeta1, alphaVbeta3, alpha3beta5, alphaIIbbeta3 [↗](#)

Stable identifier: R-HSA-2426471

Type: binding

Compartments: plasma membrane, extracellular region



Integrin alphaVbeta3 is sometimes referred to as the 'vitronectin receptor'. Vitronectin interacts with integrins alphaVbeta1 (Marshall et al. 1995), alphaVbeta3 (Pytela et al. 1985, Boettiger et al. 2001), alphaVbeta5 (Panetti & McKeown-Longo 1993) and alpha2b beta3 (Pytela et al. 1986) through Arg-Gly-Asp (RGD) cell binding sequences.

Endothelial cells lining the microvascular wall form a semi-permeable barrier to the movement of blood components. The attachment of endothelial cells to the extracellular matrix (ECM) is largely mediated by transmembrane integrins which recognize short sequence motifs such as Arg-Gly-Asp (RGD) in many ECM proteins.

Integrin alpha5beta1 and alphaVbeta3 bind to the ECM proteins fibronectin and vitronectin respectively. Both are critical for the establishment and stabilization of endothelial monolayers (Cheng & Kramer 1989). Synthetic peptides that compete with ECM proteins for the integrins or antibodies directed against alpha5beta1 and alphaVbeta3 cause endothelial cell detachment (Hayman et al. 1985, Pierschbacher & Ruoslahti 1987).

Literature references

Ruoslahti, E., Pytela, R., Pierschbacher, MD. (1985). A 125/115-kDa cell surface receptor specific for vitronectin interacts with the arginine-glycine-aspartic acid adhesion sequence derived from fibronectin. *Proc. Natl. Acad. Sci. U.S.A.*, 82, 5766-70. [↗](#)

Panetti, TS., McKeown-Longo, PJ. (1993). The alpha v beta 5 integrin receptor regulates receptor-mediated endocytosis of vitronectin. *J. Biol. Chem.*, 268, 11492-5. [↗](#)

Goodman, SL., McCartney, AC., Marshall, JF., Rutherford, DC., Mitjans, F., Hart, IR. (1995). Alpha v beta 1 is a receptor for vitronectin and fibrinogen, and acts with alpha 5 beta 1 to mediate spreading on fibronectin. *J Cell Sci*, 108, 1227-38. [↗](#)

Ginsberg, MH., Ruoslahti, E., Pytela, R., Plow, EF., Pierschbacher, MD. (1986). Platelet membrane glycoprotein IIb/IIIa: member of a family of Arg-Gly-Asp--specific adhesion receptors. *Science*, 231, 1559-62. [↗](#)

Editions

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