Integrins at a Glance

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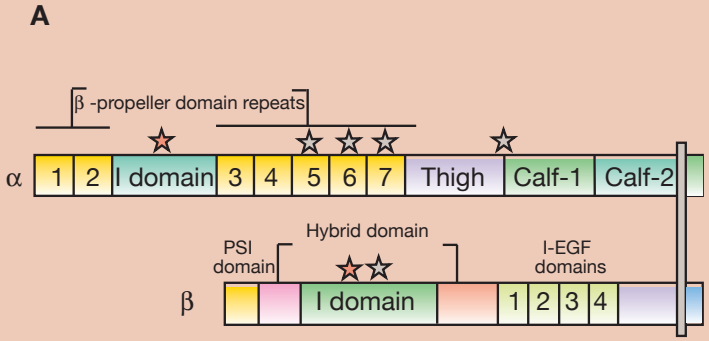

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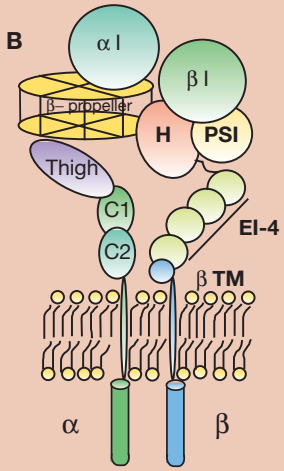

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Integrin	Human α chain characteristics	Cleavage	αI	Prototypic ligands/ recognition sequences	Additional ligands
α1β1 (CD49a, VLA1)	1151 aa		X	collagens (collagen IV > collagen I (GFOGER); collagen IX)	semaphorin 7A
α2β1 (CD49b, VLA2)	1181 aa		X	collagens (collagen I >collagen IV (GFOGER); collagen IX)	E-cadherin, endorepellin
α3β1 (CD49c, VLA3)	1051 aa, splice variants α3A and α3B	X		laminins (LN-511>LN-332>LN-211)	
α4β1 (CD49d, VLA4)	1038 aa			fibronectin, VCAM-1	
α5β1 (CD49e, VLA5)	1049 aa	X		fibronectin (RGD)	endostatin
α6β1 (CD49f, VLA6)	1073 aa, splice variants α6A and α6B	X		laminins (LN-511>LN-332>LN-111>LN-411)	
α7β1	1137 aa, splice variants X1, X2, α7A, α7B	X		α7X1β1: laminins (LN-511>LN-211>LN-411>LN-111) α7X2β1: laminins (LN-111>LN-211>LN-511)	
α8β1	1025 aa	X		fibronectin, vitronectin, nephronectin (RGD)	
α9β1	1035 aa			tenascin-C, VEGF-C, VEGF-D	
α10β1	1167 aa		X	collagens (collagen IV> collagen VI >collagen II (GFOGER); collagen IX)	
α11β1	1188 aa, inserted domain 21 aa		X	collagens (collagen I>collagen IV (GFOGER); collagen IX)	
αLβ2 (CD11a)	1170 aa		X	ICAM-1, -2, -3, -5	
αMβ2 (CD11b)	1153 aa		X	iC3b, fibrinogen + more	
αXβ2 (CD11c)	1163 aa		X	iC3b, fibrinogen + more	
αDβ2 (CD11d)	1162 aa		X	ICAM-3, VCAM-1	
αIIBβ3 (CD41, GpIIb)	1039 aa	X		fibrinogen, fibronectin (RGD)	
α6β4		X		laminins (LN-332, LN-511)	
αvβ1 (CD51)	1048 aa	X		fibronectin, vitronectin (RGD)	
αvβ3		X		vitronectin, fibronectin, fibrinogen (RGD)	tumstatin
αvβ5		X		vitronectin (RGD)	
αvβ6		X		fibronectin, TGF-β-LAP (RGD)	
αvβ8		X		vitronectin, TGF-β-LAP (RGD)	
αEβ7 (CD103, HML-1)	1178 aa	X	X	E-cadherin	
α4β7				MadCAM-1, fibronectin, VCAM-1	

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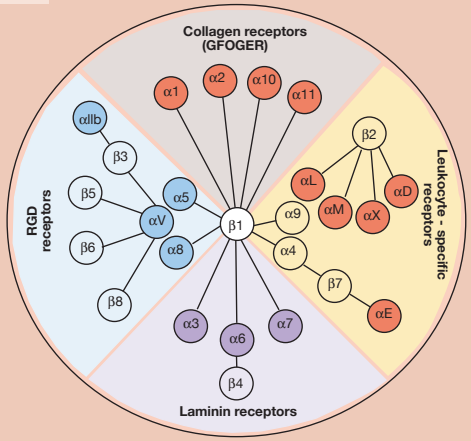

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	Integrin	Viability	Unchallenged mutant phenotype	Challenged mutant phenotype
Collagen	α1	+	No phenotype. Cell adhesion defect to collagen IV.	Reduced tumor angiogenesis, increased glomerulosclerosis, diminished callus size in bone fracture model, reduced atherosclerosis in ApoE-/- mice, reduced psoriasis in xenograft model.
	α2	+	Mild mammary gland branching morphogenesis phenotype. Platelet, fibroblast, and keratinocyte adhesion defect to collagen I.	Reduced angiogenesis in tumor and wound healing models, reduced innate immune response to peritoneal Listera infection, reduced thrombi formation increased embolization in thrombosis model.
	α10	+	Mild cartilage defect.	
	α11	+	Incisor eruption defect.	
Laminins	α3	+/-	Defects of kidney and submandibular gland, decreased bronchial branching of the lungs, skin blisters, abnormal layering of the cerebral cortex.	Faster wound healing in a Cre-model.
	α6	+/-	Severe blistering of the skin and other epithelia, absence of hemidesmosomes, altered laminin deposition in the brain. and ectopic neuroblastic outgrowths on the brain and in the eye. Mutants die at birth.	
	α7	- or +	Embryonic vasculature defect, cerebral hemorrhage, and placenta defects. Muscular dystrophy in adult mice.	Fibrotic muscle tissue when crossed with mdx mice. Protective role in exercise-induced muscle injury.
RGD	α5	-	Severe defects in posterior trunk and yolk sac mesodermal structures, lack of epithelialization of somites, reduced numbers of Schwann cells and embryonic lethality at E10-E11.	
	α8	+/-	Absent or reduced kidneys and abnormal steriosilia in the inner ear.	
	αv	- or +/-	Placental defects and intracerebral, intestinal hemhorrhages and cleft palate. Death varies from midgestation to perinatal.	
	αIIB	+	Bleeding disorder, lack of platelet binding to fibrinogen, absence of fibrinogen in platelet alpha granules, and increased numbers of hematopoietic progenitors in yolk sac, fetal liver, and bone marrow.	
	α4	-	Embryonic lethality either due to failure of chorioalloantoic fusion or cardiac abnormalities including defrects in epicardium formation.	
	α9	+/-	Bilaterlal chylothorax causing death within 14 days.	Altered cutaneous wound healing in wound model.
Leucocyte spesific	αL	+	Reduced immune response, defects in neutrophil adhesion to endothelium, and in osteoclast adhesion.	Reduced leukocyte adhesion in TNF-α induced inflammation.
	αM	+	Reduced immune response, reduced neutrophil adhesion to fibrinogen and reduced degranulation of neutrophils.	Reduced T-cell proliferative response to Staphylococcal enterotoxin, reduced wound healing, reduced cerebral ischemia, reduced encephomyelitis, reduced melanoma rejection.
	αX	+	Reduced immune response.	
	αD	+	Reduced immune response.	
	αE	+	Reduced number of intestinal and vaginal interepithelial lymphocytes, skin inflammation.	Reduced experimental colitis.
	β1	-	Null mutants die soon after implantation due to inner cell mass defects in blastocysts.	
	β2	+	Leukocyte adhesion deficiency with immune, hematopoietic and skeleton defects.	Reduced listeriosis.
	β3	- or +	Platelet defects, extended bleeding times, cutaneous and gastrointestinal bleeding, anemia, increased bone mass, hypocalcemia, reduced survival, and placental defects associated with some fetal loss.	Enhanced wound healing.
	β4	+/-	Extensive detachment of epidermis and other squamous epithelia. Stratified tissues lack hemidesmosomes and simple epithelia are also defective in adherence.	
	β5	+	Age-related blindness due to defective retinal phagocytosis. Cell adhesion defect of keratinocytes to vitronectin.	Reduced lung injury in a ventilator-induced model.
	β6	+	Baldness associated with macrophage infiltration of skin and exaggerated pulmonary inflammation.	Reduced fibrosis in a bleomycin-induced lung model, impaired mucosal mast cell response to nematode infection, reduced wound healing, increased periodontal infection.
	β7	+	Hypoplasia of gut-associated lymph tissue due to defects in lymphocyte migration.	
	β8	+ or +/-	Death either at midgestation (E11.5) as a result of circulatory abnormalities in the placenta, or the days around birth due to intracerebral hemorrhaging.	