

## DESCRIPTION

<b>Source</b>	Chinese Hamster Ovary cell line, CHO-derived		
	Human Integrin $\alpha 4$ (Tyr34 - Gln970) (Arg591Leu) Accession # P13612	Acidic Tail	6-His tag
	Human Integrin $\beta 1$ (Gln21 - Asp728) Accession # P05556	Basic Tail	
	N-terminus	C-terminus	

**N-terminal Sequence Analysis** Tyr34 ( $\alpha 4$ ) & No results obtained: Gln21predicted ( $\beta 1$ )

**Predicted Molecular Mass** 108.8 kDa ( $\alpha 4$ ) & 82.3 kDa ( $\beta 1$ )

## SPECIFICATIONS

<b>SDS-PAGE</b>	100-150 kDa, reducing conditions
<b>Activity</b>	Measured by the ability of the immobilized protein to support the adhesion of VCAM-1 transfected CHO Chinese hamster ovary cells. When $5 \times 10^4$ cells per well are added to rhIntegrin $\alpha\beta 1$ coated plates (10 $\mu\text{g}/\text{mL}$ , 100 $\mu\text{L}/\text{well}$ ), approximately 45%-75% will adhere after 1 hour at 37 °C.
<b>Endotoxin Level</b>	<1.0 EU per 1 $\mu\text{g}$ of the protein by the LAL method.
<b>Purity</b>	>90%, by SDS-PAGE under reducing conditions and visualized by silver stain.
<b>Formulation</b>	Lyophilized from a 0.2 $\mu\text{m}$ filtered solution in PBS. See Certificate of Analysis for details.

## PREPARATION AND STORAGE

<b>Reconstitution</b>	Reconstitute at 200 $\mu\text{g}/\text{mL}$ in PBS.
<b>Shipping</b>	The product is shipped with polar packs. Upon receipt, store it immediately at the temperature recommended below.
<b>Stability &amp; Storage</b>	Use a manual defrost freezer and avoid repeated freeze-thaw cycles. <ul style="list-style-type: none"> <li>● 12 months from date of receipt, -20 to -70 °C as supplied.</li> <li>● 1 month, 2 to 8 °C under sterile conditions after reconstitution.</li> <li>● 3 months, -20 to -70 °C under sterile conditions after reconstitution.</li> </ul>

## BACKGROUND

Integrin  $\alpha\beta 1$ , also called VLA4, is an integrin family adhesion receptor that shares the  $\beta 1$  subunit with eleven other family members and the  $\alpha 4$  subunit with integrin  $\alpha\beta 7$  (1 - 4). The non-covalent heterodimer of 150 kDa  $\alpha 4/\text{CD}49\text{d}$  and 130 kDa  $\beta 1/\text{CD}29$  type I transmembrane glycoprotein subunits mediates cell adhesion to VCAM-1/CD106 on other cells and the CS-1 fragment of fibronectin in the extracellular matrix (2 - 4). The  $\alpha 4$  extracellular domain (ECD) contains an N-terminal  $\beta$ -propeller structure, followed by domains termed thigh, calf-1 and calf-2 (1). The  $\beta 1$  ECD contains a vWFA domain, which interacts with the  $\alpha 4$   $\beta$ -propeller to form a binding domain when the dimer is in active, extended and open conformation. Each subunit has a transmembrane sequence and a short cytoplasmic tail. The 944 aa human  $\alpha 4$  extracellular domain (ECD) shares 85% aa identity with mouse, rat and canine  $\alpha 4$ , while the 708 aa human  $\beta 1$  ECD shares 92 - 96% aa identity with rat, bovine, mouse, and feline  $\beta 1$ . Five alternate splice forms of the human  $\beta 1$  cytoplasmic domain, including one antagonistic form, vary by 12 to 48 aa and show differential expression patterns (5). Leukocytes (except for neutrophils), erythroid precursors and some non-hematopoietic cells such as epicardial, endothelial and smooth muscle precursors, Schwann cells, and chorionic cells express  $\alpha\beta 1$  (6 - 10). Deletion is lethal in the mouse embryo due to faulty placentation and development of the epicardium and coronary vessels (7, 10). In the adult,  $\alpha\beta 1$  primarily regulates immune cell migration (11 - 13). Circulating leukocyte  $\alpha\beta 1$  is rapidly activated by inflamed endothelial cells that present VCAM-1 and chemokines such as SDF-1 (11). This activation facilitates rolling, firm adhesion, and extravasation. Interfering with leukocyte migration via the therapeutic  $\alpha\beta 1$  antibody Natalizumab can reduce the severity of autoimmune disorders such as multiple sclerosis (12). Natalizumab can also mobilize hematopoietic precursors from the bone marrow by impeding their interaction with stromal cell VCAM-1 (8, 12). During immune cell activation,  $\alpha\beta 1$  can function as a costimulatory molecule (13, 14).

## References:

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