

## BACKGROUND

The Integrins are a family of alpha/beta heterodimeric receptors that mediate dynamic linkages between extracellular adhesion molecules and the intracellular actin cytoskeleton. Integrins are expressed by all multicellular animals, but their diversity varies widely among species; for example, in mammals, 19 alpha and 8 beta subunit genes encode polypeptides that combine to form 25 different receptors. Both Integrin subunits are type I transmembrane proteins with large extracellular and short cytoplasmic domains of 700-1100 and 30-50 residues respectively. Integrins are ubiquitously expressed and at physiological conditions, Integrins are highly glycosylated and contain a Ca<sup>2+</sup> or Mg<sup>2+</sup> ion, which is essential for ligand binding. Integrin receptors are critical for cell attachment to the extracellular matrix (ECM) and this is mediated through integrin-fibronectin, -vitronectin, -collagen and - laminin interactions. Intracellularly, Integrins form adhesion complexes with proteins including talin, vinculin, paxillin and alpha-actinin. They also regulate kinases, such as focal adhesion kinase and Src family kinases, to mediate attachment to the actin cytoskeleton. Integrins also have a significant role in cell signaling and can activate protein kinases involved in the regulation of cell growth, division, survival, differentiation, migration and apoptosis. The beta 1, beta 3, and beta 5 Integrin intracellular domains are sufficient to initiate signal transduction pathways. Furthermore, alternative splicing can regulate the ability of beta integrin intracellular domains to participate in signal transduction. Glycoprotein II/IIIb (alphaIIb/beta3) is an integrin receptor found on the surface of platelets. It is involved in the cross-linking of platelets with fibrin, and so has a vital role in blood clot formation.<sup>1</sup>

The integrins alpha4/CD49d (alpha4beta1 and alpha4beta7) are heterodimer cell adhesion receptors mainly expressed on cells of hematopoietic origin that mediate cell-cell and cell-extracellular matrix interactions. Vascular cell adhesion molecule-1 (VCAM-1) and the alternatively spliced connecting segment-1 (CS-1) region of fibronectin constitute ligands for both integrins, whereas alpha4beta7 can additionally interact with mucosal addressin cell adhesion molecule-1. alpha4beta1 and alpha4beta7 play key roles in leukocyte recruitment to inflammatory sites and in lymphocyte recirculation, and alpha4beta1 function is required during hematopoiesis in the bone marrow.<sup>2</sup> A characteristic feature of alpha4 integrins on most leukocytes is that their adhesive activity can be up-regulated by external stimuli, leading to firm attachment. Several chemokines binding to their G protein-coupled receptors, as well as cytokines whose receptors have tyrosine kinase activity have been previously demonstrated to rapidly and transiently increase alpha4 integrin-dependent cell adhesion. For instance, the chemokine stromal

cell-derived factor-1alpha (SDF-1alpha) up-regulates alpha4 integrin-mediated lymphocyte, hematopoietic progenitor, and myeloma cell adhesion.<sup>3</sup> The enhancement in adhesion was shown to be independent of changes in alpha4 surface expression and was suggested to be the result of variations in the avidity and/or affinity of these integrins for their ligands. In addition, TGF-beta1 can potentially contribute to cell migration by dynamically regulating cell adhesion mediated by alpha4 integrins.<sup>4</sup>

### References:

1. Schwartz, M.A. & Ginsberg, M.H.: et al: Nature Cell Biol. 4:E65-E68, 2002
2. Lobb, R.R. & Hemler, M.E.: J. Clin. Invest. . 94:1722-8, 1994
3. Postigo, A.A. et al: Res Immunol. 144:723-35, 1993
4. Bartolomé, R.A. et al: Mol. Biol. Cell 14:54-66, 2003

## TECHNICAL INFORMATION

### Source:

ITGA4 Antibody is a rabbit antibody raised against a short peptide from human ITGA4 sequence.

### Specificity and Sensitivity:

This antibody detects endogenous levels of ITGA4 proteins without cross-reactivity with other related proteins.

**Storage Buffer:** PBS and 30% glycerol

### Storage:

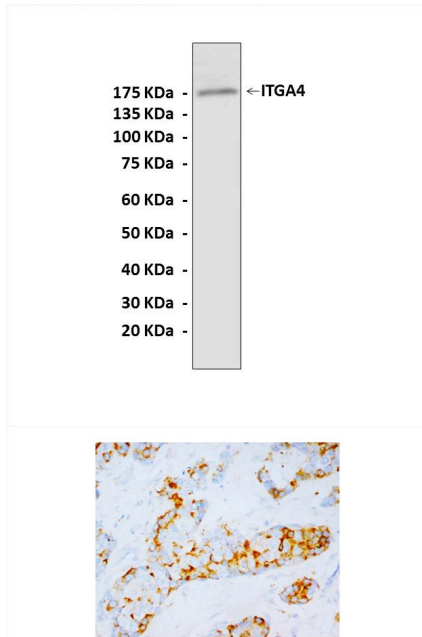
Store at -20°C for at least one year. Store at 4°C for frequent use. Avoid repeated freeze-thaw cycles.

## APPLICATIONS

| Application:  | *Dilution: |
|---|------------|
| <b>WB</b>   | 1:1000     |
| <b>IP</b>   | n/d        |
| <b>IHC</b>  | 1:50-200   |
| <b>ICC</b>  | n/d        |
| <b>FACS</b>   | n/d        |
| <i>*Optimal dilutions must be determined by end user.</i> |            |



## QUALITY CONTROL DATA



**Top:** Western blot detection of integrin-alpha4 protein in rat brain tissue using integrin-alpha4 Antibody.  
**Bottom:** This antibody stains paraffin-embedded human breast cancer tissue in immunohistochemical analysis.

