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Anti-human Integrin α5β1 Monoclonal Antibody

Catalog No.: YR0373

Basic Information

Molecular Weight
150kDa

Endotoxin
<1EU/mg (<0.001EU/μg)Determined by LAL gel clotting assay

Sterility
0.2 μm filtration

Aggregation
<5% Determined by SECP

Purity
>95% Determined by SDS-PAGE

Reported Applications

ELISA,neutralization,functional assays such as bioanalytical PK and ADA assays,and those assays for studying biological pathways

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Background

Volociximab Biosimilar uses the same protein sequences as the therapeutic antibody volociximab. Volociximab is a high-affinity IgG4 chimeric (82% human, 18% murine) monoclonal antibody that specifically binds to α5β1 integrin. Integrins are a superfamily of widely expressed transmembrane glycoprotein receptors for extracellular matrix ligands, such as fibronectin, vitronectin, laminin, collagens, and other plasma membrane proteins, and function in the regulation of a broad variety of cellular processes, including embryogenesis, inflammation, bone metabolism, apoptosis, cell proliferation, angiogenesis, and tumor metastasis. Integrins exist as noncovalent heterodimers comprising α and β subunits. Receptor diversity, function, and versatility in ligand binding is determined by the specific pairing of α and β subunits. The cytoplasmic tail of the β subunit links to the actin cytoskeleton and components of the focal adhesion plaque. The interaction with the focal adhesion plaque can lead to signaling, through different pathways, to influence cell survival, growth, and motility. Consequently, all of these protein associations allow cells to sense and respond to their extracellular environment. Endothelial cell expression of the α5β1 integrin and the ligand fibronectin are both up-regulated during tumor angiogenesis. The sites of the α5β1 integrin increase in expression and are more accessible in the vasculature during angiogenesis and tumor growth, which is in contrast to normal tissue vasculature. Disruption of α5β1 integrin binding to fibronectin results in the inhibition of angiogenesis and the induction of apoptosis of activated endothelial cells. In preclinical models, selective antagonists targeted to α5β1 integrin inhibit tumor growth. Relevant preclinical models for the mechanism of action and antitumor activity evaluation were selected based on the cross-reactivity of volociximab to the nonhuman α5β1 homologues. Volociximab and its parent mouse antibody, IIA1, do not cross-react with murine α5β1 integrin, but do cross-react and block the chicken and cynomolgus monkey target protein. Volociximab inhibited human umbilical vein endothelial cells from forming tube-like vessel structures in a three-dimensional fibrin matrix in vitro and was independent of the growth factor stimulus. These data suggest that the α5β1 signaling pathways are downstream of growth factor stimulation. Moreover, volociximab inhibited growth factor–stimulated human neonatal foreskin vascular growth when grafted into severe combined immunodeficient mice in vivo. In addition, volociximab inhibited vessel formation and human tumor xenograft growth in the chicken chorioallantoic membrane model in ovo. Finally, in a preclinical model of choroidal neovascularization in cynomolgus monkeys, volociximab was a potent inhibitor of angiogenesis.

Immunogen Information

Clone
Volociximab Biosimilar

Isotype
Human IgG4 kappa

Immunogen
Human Integrin α5β1

RecommendedIsotype Control(s)
In Vivo Grade Recombinant Human IgG4-S228P Kappa Isotype Control Antibody

Recommended Dilution Buffer
1×PBS pH 6.0

Product Information

Production
Purified from cell culture supernatant in an animal-free facility

Purification
Protein A/G

Storage
Store at -20℃