

ACTR-IA (Y0311): sc-73676

BACKGROUND

Activins, members of the TGF β superfamily, act through an evolutionarily conserved signaling pathway to elicit a diverse range of biological responses. These factors signal through a heteromeric complex of type I and II serine/threonine kinase receptors that phosphorylate members of the Smad family of transcription factors. ACTR-IA (Activin receptor type-I A), also known as Activin receptor-like kinase-2 (ALK-2), ACVRI, ACTRI, ACVRLK2 or serine/threonine kinase receptor (SKR1), is a type I receptor that is predominantly expressed in placenta, heart and skeletal muscle. ACTR-IA signals through the BMP branch of TGF β signaling which leads to the phosphorylation and activation of transcription factors Smad1, Smad5 and Smad8. ACTR-IA may be involved in stimulating the epithelial-mesenchymal transformation in the atrioventricular cushion of the developing heart. In addition, a mutation in the gene encoding ACTR-IA may play a role in causing fibrodysplasia ossificans progressiva (FOP).

REFERENCES

1. Kaartinen, V., Dudas, M., Nagy, A., Sridurongrit, S., Lu, M.M. and Epstein, J.A. 2004. Cardiac outflow tract defects in mice lacking ALK-2 in neural crest cells. *Development* 131: 3481-3490.
2. Brederlau, A., Faigle, R., Elmi, M., Zarebski, A., Sjöberg, S., Fujii, M., Miyazono, K. and Funahashi, K. 2004. The bone morphogenetic protein type Ib receptor is a major mediator of glial differentiation and cell survival in adult hippocampal progenitor cell culture. *Mol. Biol. Cell* 15: 3863-3875.
3. Besser, D. 2004. Expression of Nodal, Lefty-A, and Lefty-B in undifferentiated human embryonic stem cells requires activation of Smad2/3. *J. Biol. Chem.* 279: 45076-45084.
4. de Sousa Lopes, S.M., Roelen, B.A., Monteiro, R.M., Emmens, R., Lin, H.Y., Li, E., Lawson, K.A. and Mummery, C.L. 2004. BMP signaling mediated by ALK-2 in the visceral endoderm is necessary for the generation of primordial germ cells in the mouse embryo. *Genes Dev.* 18: 1838-1849.
5. Desgrosellier, J.S., Mundell, N.A., McDonnell, M.A., Moses, H.L. and Barnett, J.V. 2005. Activin receptor-like kinase-2 and Smad6 regulate epithelial-mesenchymal transformation during cardiac valve formation. *Dev. Biol.* 280: 201-210.
6. Wang, J., Sridurongrit, S., Dudas, M., Thomas, P., Nagy, A., Schneider, M.D., Epstein, J.A. and Kaartinen, V. 2005. Atrioventricular cushion transformation is mediated by ALK-2 in the developing mouse heart. *Dev. Biol.* 286: 299-310.
7. Shore, E.M., Xu, M., Feldman, G.J., Fenstermacher, D.A., Cho, T.J., Choi, I.H., Connor, J.M., Delai, P., Glaser, D.L., LeMerrer, M., Morhart, R., Rogers, J.G., Smith, R., Triffitt, J.T., Urtizberea, J.A., Zasloff, M., Brown, M.A. and Kaplan, F.S. 2006. A recurrent mutation in the BMP type I receptor ACVRI causes inherited and sporadic fibrodysplasia ossificans progressiva. *Nat. Genet.* 38: 525-527.
8. Nakajima, M., Haga, N., Takikawa, K., Manabe, N., Nishimura, G. and Ikegawa, S. 2007. The ACVRI 617G→A mutation is also recurrent in three Japanese patients with fibrodysplasia ossificans progressiva. *J. Hum. Genet.* 52: 473-475.

CHROMOSOMAL LOCATION

Genetic locus: ACVRI (human) mapping to 2q24.1.

SOURCE

ACTR-IA (Y0311) is a mouse monoclonal antibody raised against extracellular domain of ACTR-IA of human origin.

PRODUCT

Each vial contains 100 μ g IgG₁ in 1.0 ml of PBS with < 0.1% sodium azide and protein stabilizer.

APPLICATIONS

ACTR-IA (Y0311) is recommended for detection of ACTR-IA of human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) and immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

Suitable for use as control antibody for ACTR-I siRNA (h): sc-40202, ACTR-I shRNA Plasmid (h): sc-40202-SH and ACTR-I shRNA (h) Lentiviral Particles: sc-40202-V.

Molecular Weight of ACTR-IA: 57 kDa.

RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgG κ BP-HRP: sc-516102 or m-IgG κ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use m-IgG κ BP-FITC: sc-516140 or m-IgG κ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

STORAGE

For immediate and continuous use, store at 4° C for up to one month. For sporadic use, freeze in working aliquots in order to avoid repeated freeze/thaw cycles. If turbidity is evident upon prolonged storage, clarify solution by centrifugation.

RESEARCH USE

For research use only, not for use in diagnostic procedures.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.