3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone 800-325-5832 • (314) 771-5765
Fax (314) 286-7828
email: techserv@sial.com
sigma-aldrich.com

ProductInformation

Anti-Cortactin (KE-20)
Developed in Rabbit
IgG Fraction of Antiserum

Product Number **C 7112**

Product Description

Anti-Cortactin (KE-20) is developed in rabbit using a synthetic peptide corresponding to the mid-region of human cortactin (amino acids 361-380) conjugated to KLH as immunogen. This sequence is highly conserved (single amino acid substitution) in mouse cortactin. No homology is observed with HS1/LCKBP1 and HIP55 proteins. Whole antiserum is fractionated and then further purified by ion-exchange chromatography to provide the IgG fraction of antiserum that is essentially free of other rabbit serum proteins.

Anti-Cortactin (KE-20) recognizes human, rat, mouse, and chicken cortactin, (65-75 kDa, 2-3 bands). Applications include the detection of cortactin by immunoblotting and indirect immunofluorescence. Staining of cortactin in immunoblotting is specifically inhibited with the cortactin immunizing peptide (human, amino acids 361-380).

The cortical cytoskeleton, a highly cross-linked submembranal F-actin filament network, plays an important role in cell proliferation, differentiation, migration, cell morphology, and oncogenic transformation. Direct morphological changes in the plasma membrane are produced by rearrangement of the cortical cytoskeleton through a variety of signaling pathways involving Rho GTPase, MAP kinases, and tyrosine kinases.[1] Cortactin (p80/85, EMS1 oncogene), is an F-actin binding protein and a prominent substrate for several non-receptor tyrosine kinases including Src, Fer, and Syk.[2-5] It represents a highly conserved family of perimembrane signaling proteins including the hematopoietic lineage cell specific proteins HS1/LCKBP1 and HIP55.

Cortactin exists as multiple isoforms (75-85 kDa), formed by alternative splicing. It contains a unique multi-domain structure consisting of 6.5 tandem repeats of a 37-amino acid sequence required for direct binding to F-actin, followed by an α-helix region, a proline-rich region, and three tyrosine residues targeted by Src-related kinases.[2,6] The C-terminal region contains a Src-homology 3 (SH3) domain that interacts with several postsynaptic density (PSD), PDZ-family proteins, including cortactin-binding protein 1 (CortBP1), SHANK3, ZO-1, and CBP-90.[7] Cortactin is enriched within lamellipodia of motile cells and in neuronal growth cones.[2,6,7] Cortactin is normally phosphorylated on serine and threonine residues. Reorganization of the cortical cytoskeleton induced by a variety of cellular stimuli, including activation of fibroblasts by growth factors, cell stress and damage, results in translocation of cortactin to specific cortical actin structures and transient phosphorylation of tyrosine residues.[8-10] Cortactin becomes heavily phosphorylated on tyrosine in pp60src transfected oncogenic fibroblasts and accumulates with F-actin in podosomes. Cortactin co-localizes with the actin-related protein Arp2/3 complex at sites of actin polymerization within the lamellipodia.[11] It binds directly to the Arp2/3 complex and activates it to promote assembly of branched actin filaments networks.[12,13]

Cortactin is overexpressed in human breast cancer and in head and neck tumors through gene amplification. The human cortactin gene is located at chromosome 11q13. Overexpression of cortactin and redistribution of cortactin into podosome-like structures has been observed in human carcinoma cell lines with amplification of the 11q13 region, suggesting that cortactin is involved in tumor cell invasion and metastasis.[14,15]

Reagent

Anti-Cortactin (KE-20) is supplied as a solution in 0.01 M phosphate buffered saline, pH 7.4, containing 15 mM sodium azide.

Precautions and Disclaimer

Due to the sodium azide content, a material safety data sheet (MSDS) for this product has been sent to the attention of the safety officer of your institution. Consult the MSDS for information regarding hazards and safe handling practices.

Storage/Stability
For continuous use, store at 2-8 °C for up to one month. For prolonged storage, freeze in working aliquots at –20 °C. Repeated freezing and thawing is not recommended. Storage in frost-free freezers is also not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilutions should be discarded if not used within 12 hours.

Product Profile
A minimum working dilution of 1:1,000 is determined by immunoblotting, using a rat brain cytosol extract, a whole extract of chicken embryo fibroblasts, or a whole cell extract of the human epidermoid carcinoma A431 cell line.

A minimum working dilution of 1:500 is determined by indirect immunofluorescence, using the mouse fibroblasts NIH3T3 cell line.

Note: In order to obtain the best results using different techniques and preparations, we recommend determining the optimal working dilutions by titration.

References

1. Hall, A., Science, **279**, 509-514 (1998).
2. Wu, H., et al., Mol. Cell. Biol., **11**, 5113-5124 (1991).
3. Wu, H., and Parsons, J.T., J. Cell Biol., **120**, 1417-1426 (1993).
4. Maruyama, S., et al., J. Biol. Chem., **271**, 6631-6635 (1996).
5. Kim, L., and Wong, T.W., J. Biol. Chem., **273**, 23542-23548 (1998).
6. Huang, C., et al., J. Biol. Chem., **273**, 25770-25776 (1998).
7. Du, Y., et al., Mol. Cell. Biol., **18**, 5838-5851 (1998).
8. Zhan, X., et al., J. Biol. Chem., **268**, 24427-24431 (1993).
9. Kapus, A., et al., J. Biol. Chem., **274**, 8093-8102 (1999).
10. Li, Y., et al., J. Biol. Chem., **275**, 37187-37193 (2000).
11. Weed, S.A., et al., J. Cell Biol., **151**, 29-40 (2000).
12. Urono, T., et al., Nature Cell Biol., **3**, 259-266 (2001).
13. Weaver, A.M., Curr. Biol., **11**, 370-374 (2001).
14. Schuuring, E., et al., Mol. Cell. Biol., **13**, 2891-2898 (1993).
15. van Damme, H., et al., J. Biol. Chem., **272**, 7374-7380 (1997).

KAA/ER 08/02