α-II-Spectrin Rabbit Polyclonal Antibody

RPCA-aII-Spec

Ordering Information
Web *www.encorbio.com*
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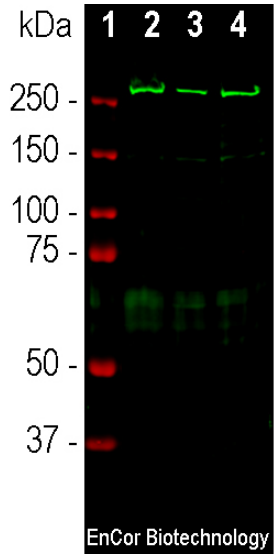
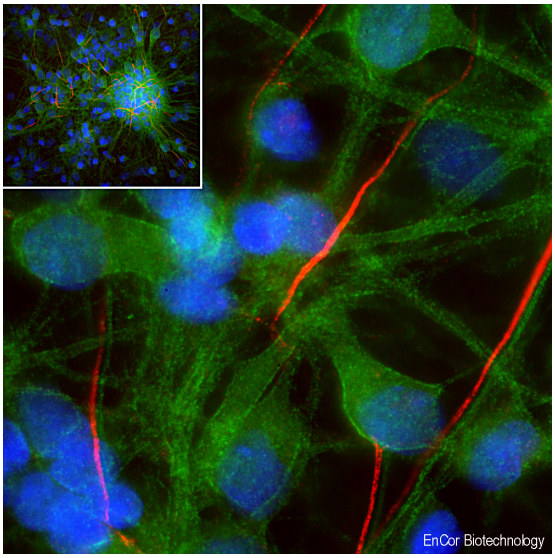
HGNC Name: *SPTAN1*
UniProt: *Q13813*
RRID: *AB_2572382*
Immunogen: *Recombinant constructs spanning most of human alpha-II spectrin expressed in and purified from E. coli*
Format: *Antibody is supplied as an aliquot of serum plus 5mM NaN_3*
Storage: *Store at 4°C for short term, for longer term at -20°C. Avoid freeze / thaw cycles.*
Recommended dilutions:
WB: 1:2,000-5,000. ICC/IF and IHC: 1:500-1:1,000 .

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
WB, IF/ICC, IHC	Rabbit		~240kDa	Hu, Rt, Ms, Co



Western blot analysis of different tissue lysates using rabbit pAb to αII-spectrin, RPCA-aII-Spec, dilution 1:2,000 in green: [1] protein standard (in red), [2] rat brain, [3] mouse spinal cord, and [4] cow cortex. The prominent band above 250kDa represents the intact αII-spectrin.



Immunofluorescent analysis of cortical neuron-glial cell culture from E20 rat embryos stained with rabbit pAb to αII-spectrin, RPCA-aII-Spec, dilution 1:500 in green, and costained with mouse mAb to Ankyrin3, MCA-2A8, dilution 1:2,000 in red. The blue is Hoechst staining of nuclear DNA. The spectrin antibody stains submembranous cytoskeleton of neuronal cells. The Ankyrin3 antibody labels axonal initial segments of neurons.

Background:

Spectrin family molecules are important high molecular weight components of the submembranous cytoskeleton of eukaryotic cells. These proteins were isolated originally from lysed red blood cell membrane preparations which were named "ghosts", which gave rise to the name spectrin (1). Spectrin family molecules are mostly composed of spectrin repeats, compact ~110 amino acid modules made of three closely packed α-helices, though they may also include SH3 domains, PH domains, EF hands and other important binding sites. They function as major components of the membraneous cytoskeleton, mediating interactions between integral membrane proteins, actin and many other cellular components. The RPCA-aII-Spec antibody binds specifically to αII-spectrin, also known as non-erythroid spectrin or fodrin (2-4). In the CNS this protein is expressed only in neurons and so the antibody can be used to reveal the submembranous neuronal cytoskeleton in IF, ICC and IHC. Defects in spectrin genes present as a variety of diseases (5,6). The molecule is subject to proteolysis by calpain producing a 150kDa and 145kDa C-terminal fragments and by caspase producing a slightly different 150kDa C-terminal fragment and a 120kDa C-terminal fragment. Since caspase activation is characteristic of apoptosis and calpain activation of necrosis, it may be possible to use selective monitoring of each type of cell death by monitoring the content of these protein fragments (7).

The RPCA-aII-Spec antibody was made against the recombinant human protein construct derived from the C-terminus of αII-spectrin comprising the C-terminal 14 spectrin repeats, specifically amino acids 676-2447. This antibody can be used to study αII-spectrin on western blots and to visualize the neuronal plasma membrane cytoskeleton in cells in culture and sectioned material. We also have made available a mouse monoclonal antibody to the C-terminal region of αII-spectrin which can be used to monitor the presence of calpain and caspase derived spectrin breakdown products MCA-3D7 (7).

References:

1. *Marchesi VT, Steers E. Selective solubilization of a protein component of the red cell membrane. Science 159:203-4 (1968).*
2. *Levine J, Willard M. Fodrin: axonally transported polypeptides associated with the internal periphery of many cells. J. Cell Biol. 90:631-42 (1981).*
3. *Bennett V, Baines AJ. Spectrin and ankyrin-based pathways: metazoan inventions for integrating cells into tissues. Physiol. Rev. 81:1353-92 (2001).*
4. *Djinovic-Carugo K, Gautel M, Ylänne J, Young P. The spectrin repeat: a structural platform for cytoskeletal protein assemblies. FEBS Lett. 513:119-23 (2002).*
5. *Bennett V, Healy J. Organizing the fluid membrane bilayer: diseases linked to spectrin and ankyrin. Trends Mol. Med. 14:28-36 (2008).*
6. *Eber S, Lux SE. Hereditary spherocytosis–defects in proteins that connect the membrane skeleton to the lipid bilayer. Semin. Hematol. 41:118-41 (2004).*
7. *Mondello S, et al. αII-spectrin breakdown products (SBDPs): diagnosis and outcome in severe traumatic brain injury patients J. Neurotrauma 27:1203-13 (2010).*

Abbreviation Key:

mAb—Monoclonal Antibody pAb—Polyclonal Antibody WB—Western Blot IF—Immunofluorescence ICC—Immunocytochemistry IHC—Immunohistochemistry E—ELISA Hu—Human Mo—Monkey Do—Dog Rt—Rat Ms—Mouse Co—Cow Pi—Pig Ho—Horse Ch—Chicken Dr—D. rerio Dm—D. melanogaster Sm—S. mutans Ce—C. elegans Sc—S. cerevisiae Sa—S. aureus Ec—E. coli.