Nestin
Rabbit Polyclonal Antibody

RPCA-Nestin

Ordering Information
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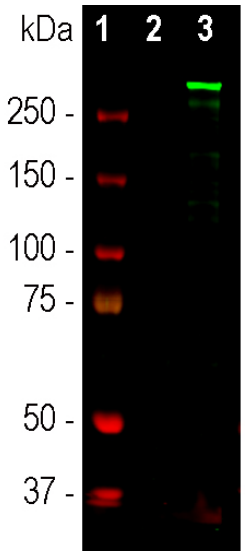
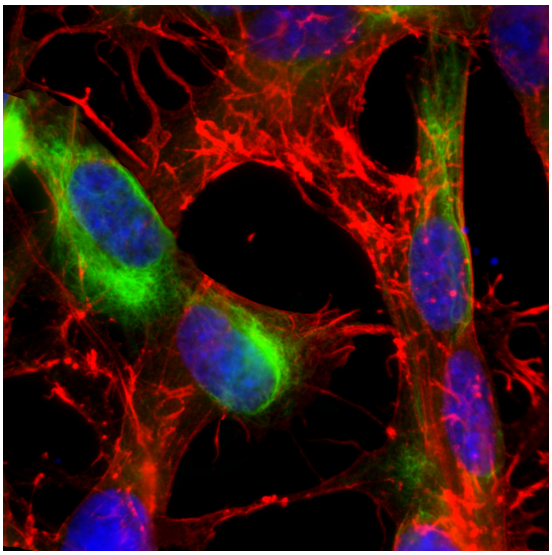
HGNC Name: *NES*
UniProt: *P48681*
RRID: *AB_2572356*
Immunogen: *Recombinant construct, amino acids 317-630 of the human protein expressed in and purified from E. coli.*
Format: *Purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM NaN_3*
Storage: *Stable at 4°C for one year, for longer term store at -20°C*
Recommended dilutions:
WB: 1:1,000-5,000. IF/ICC 1:2,000-5,000

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
WB, IF/ICC	Rabbit		~240kDa by SDS-PAGE	Hu, not rodent



Western blot analysis of different cell lysates using rabbit pAB to nestin, RPCA-Nestin, dilution 1:3,000 in green: [1] protein standard, [2] rat cortical neuron-glial cell culture , and [3] SH-SY5Y cells. High molecular weight band corresponds to nestin protein detected only in human cells.



Immunofluorescent analysis of SH-SY5Y cell culture stained with rabbit pAb to nestin, RPCA-Nestin, dilution 1:3,000 in green, and costained with mouse mAb to actin, MCA-5J11, dilution 1:500 in red. Blue is Hoechst staining of nuclear DNA. RPCA-Nestin antibody produces strong staining in the cytoplasm in clearly filamentous fashion, while actin antibody stains the submembranous actin-rich cytoskeleton, stress fibers and bundles of actin associated with cell adhesion sites.

Background:

Nestin is a member of the class IV intermediate filament protein family which is expressed in neuroepithelial stem cells, which is the origin of the name nestin. Nestin was originally identified as a result of the production of a series of monoclonal antibodies directed against epitopes expressed on formalin fixed embryo day 15 rat spinal cord tissue (1). One of these antibodies, called Rat 401, stained fibrous profiles in the developing nervous system, but not in the mature nervous system. By screening bacteriophage expression libraries with the Rat 401 antibody, Lendahl et al. (2) were able to isolate a cDNA encoding the protein to which Rat 401 antibody bound. The protein proved to be an unusual member of the intermediate filament family, containing an α-helical region homologous to that found in keratin and neurofilament subunits. The nestin protein has a very short non-helical N-terminal region followed by the α-helical region and a very long and repetitive C-terminal region. Nestin is expressed by radial glia and other types of dividing cells in the developing central and peripheral nervous systems and in developing muscle. Nestin is expressed in many types of brain tumor in particular in gliomas (3,4). Nestin is also a marker of stem cells in the pancreas (4) and heart (5) and reactive astrocytes following CNS injury (6). In the mature brain, nestin is useful as a marker of resident stem cells, particularly in the dentate gyrus of the hippocampus and the olfactory bulb. The nestin amino acid sequence is relatively poorly conserved in protein sequence across species boundaries, so that the mouse and human proteins have an overall identity of only 62%. As a result, antibodies to the human protein often fail to recognize the rodent homologue and vice versa. However this antibody works well on both human and rodent cells and tissues.

The RPCA-Nestin antibody was made against a purified recombinant construct corresponding to amino acids 317-630 of the human protein, a region of the C-terminal "tail" region of the molecule, see NCBI entry NP_006608.1. This region is relatively poorly conserved across species boundaries the RPCA-Nestin antibody is cross-reactive as a result does not recognize rodent nestin. We also supply a mouse monoclonal and a chicken polyclonal antibody to the same recombinant human construct, MCA-4D11 and CPCA-Nestin respectively.

References:

1. Lendahl U, Zimmerman LB, McKay RD. CNS stem cells express a new class of intermediate filament protein. Cell 60:585-95 (1990).
2. Hockfield S, McKay RD. Identification of major cell classes in the developing mammalian nervous system. J. Neurosci. 5:3310-28 (1985).
3. Tohyama T. et al. Nestin expression in embryonic human neuroepithelium and in human neuroepithelial tumor cells. Lab. Invest. 66:303-13 (1992).
4. Neradi J, Veselska R. Nestin as a marker of cancer stem cells. Cancer Sci. 106:803-11 (2015).
5. Zulewski H, et al. Multipotential Nestin-Positive Stem Cells Isolated From Adult Pancreatic Islets Differentiate Ex Vivo Into Pancreatic Endocrine, Exocrine, and Hepatic Phenotypes. Diabetes 50:521-33 (2001).
6. Calderone A. The Biological Role of Nestin(+)-Cells in Physiological and Pathological Cardiovascular Remodeling. Front. Cell Dev. Biol. 14;6:15 (2018).
7. Clarke SR, Shetty AK, Bradley JL, Turner DA Reactive astrocytes express the embryonic intermediate neurofilament nestin. Neuroreport 5:1885-8 (1994).
8. Wiese C, et al. Nestin expression – a property of multi-lineage progenitor cells? Cell Mol. Life Sci. 61:2510-22 (2004).

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.

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