NF-L DegenoTag™ Peptide Mouse Monoclonal Antibody

MCA-1D44

Ordering Information
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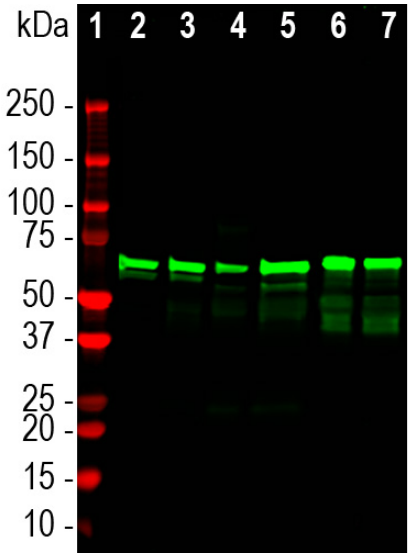
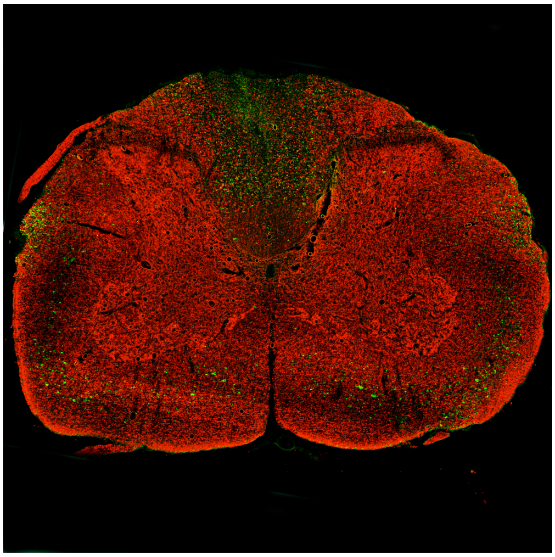
HGNC Name: *NEFL*
UniProt: *P07196*
RRID: *AB_2923483*
Immunogen: *Proprietary recombinant construct containing amino acids of human NF-L expressed in and purified from E. coli.*
Format: *Purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM NaN_3*
Storage: *Shipped on ice. Store at 4°C for short term, for longer term at -20°C. Avoid freeze / thaw cycles.*
Recommended dilutions:
WB: 1:1,000-1:2,000. ICC/IF: 1:1,000. IHC 1:1,000

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
WB, ICC/IF, ELISA	Mouse	IgG1 heavy, κ light	68-70kDa by SDS-PAGE	Hu, Rt, Ms, Bo, Po



Western blot analysis of different tissue lysates using mouse mAb to NF-L-DegenoTag™ antibody MCA-1D44, dilution 1:1,000 in green: Lane [1] protein standard with standards of indicated molecular weight and homogenates of [2] rat brain, [3] rat spinal cord, [4] mouse brain, [5] mouse spinal cord, [6] cow spinal cord, and [7] pig spinal cord. Strong band at about 68kDa corresponds to full length NF-L protein. Lower molecular weight bands detected in the samples are presumably proteolytic forms of NF-L.



A Keyence merged image of an entire coronal section from a of rat given a contusion injury three days previously and stained for RPCA-NF-L-ct in red and MCA-1D44 in green. MCA-1D44 positive profiles are particularly obvious in the dorsal columns, corticospinal tracts and rubrospinal tracts, less abundant in the lateral and ventral funuculi and least abundant but not totally absent in the spinal cord gray matter. Full details of these findings are described in a pending peer-reviewed research report and in our recent BioRχiv article.

Background:

We have recently developed a series of novel antibody reagents which we call DegenoTag™ products. These are antibodies which recognize epitopes in a small segment of the neurofilament NF-L subunit which are normally not accessible to antibodies but which became available on degeneration. We have evidence that these epitopes are made accessible as a result of degeneration induced proteolysis, and in agreement with this hypothesis we could make previously negative control tissues become strongly DegenoTag™ antibody positive by treatment with proteases. In addition healthy CNS tissues do not stain with DegenoTag™ reagents except for a tiny minority of apparently spontaneously degenerating neuronal cells and processes. In stark contrast DegenoTag™ reagents strongly bind numerous profiles in tissues from animals given experimental spinal cord injuries. We also discovered that our antibodies to the C-terminal of NF-L, such as our rabbit polyclonal RPCA-NF-L-ct and mouse monoclonal MCA-DA2 fail to stain these degenerated profiles. Our reagents can therefore be used to positively identify both healthy and degenerated processes. Process and cells undergoing degeneration show both types of DegenoTag™ reagent.

MCA-1D44 was raised against a proprietary recombinant immunogen based on the Coil 2 region of human NF-L, the region to which the antibodies described by Norgren et al. bind (7). The antibody works well on western blots of a variety of species but like the Norgren et al. antibodies binds only degenerating or degenerated processes in sectioned material (8). Other Uman type antibodies we market are MCA-1B11 and MCA-6H63. Full details of these findings are described in our a BioRχiv and in greater detail in a peer-reviewed publication in Brain Communications. It also works well on paraffin embedded histological sections of rodent CNS tissues, including transgenic mouse models. It is also an excellent capture reagent in ELISA. EnCor also markets other DegenoTag™ reagents such as MCA-6H63, a mouse monoclonal with a different neoepitope than MCA-1D44 and the chicken polyclonal CPCA-NF-L-Degen.

References:

1. Hoffman et al. Neurofilament gene expression:a major determinant of axonal caliber. PNAS 84:3472-6 (1987).
2. Perrot R, et al. Review of the Multiple Aspects of Neurofilament Functions, and their Possible Contribution to Neurodegeneration. Mol. Neurobiol. 38:27-65 (2008).
3. Lépinoux-Chambaud C. Eyer J. Review on intermediate filaments of the nervous system and their pathological alterations. Histochem. Cell Biol. 140:13-22 (2013).
4. Liu Q. et al. Neurofilamentopathy in Neurodegenerative Diseases. Open Neurol. J. 5:58–62 (2011).
5. Bacioglu M, et al. Neurofilament light chain in blood and CSF as marker of disease progression in mouse models and in neurodegenerative diseases. Neuron 91:56-66 (2016).
6. Ayers J. L. et al. Prion-like propagation of mutant SOD1 misfolding and motor neuron disease spread along neuroanatomical pathways. Acta Neuropathol. 131:103-114 (2016).
7. Norgren N, Karlsson JE, Rosengren L, Stigbrand T. Monoclonal antibodies selective for low molecular weight neurofilaments. Hybridoma and Hybridomics 21:53-9 (2002).
8. Shaw G, et al. Uman type neurofilament light antibodies are effective reagents for the imaging of neurodegeneration. Brain Communications doi.org/10.1093/braincomms/fcad067.

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.