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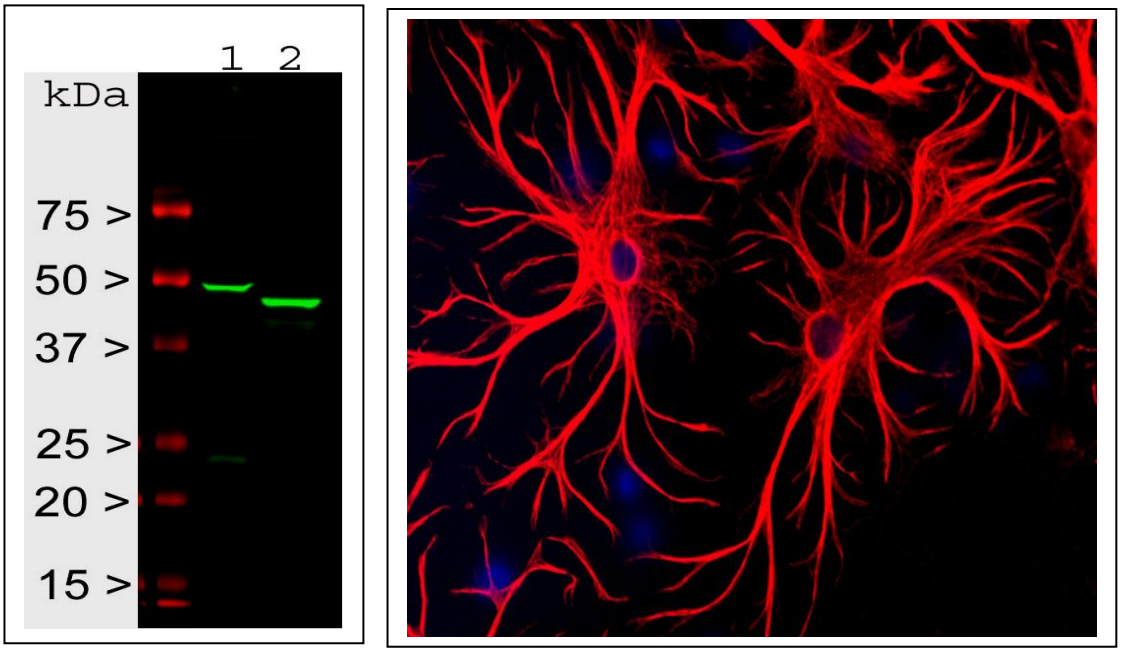
Catalogue# CPCA-GFAP: Chicken Polyclonal Antibody to GFAP

The Immunogen: Glial Fibrillary Acidic Protein (GFAP) was discovered by Amico Bignami and coworkers as a major fibrous protein of multiple sclerosis plaques (1). It was subsequently found to be a member of the 10nm or intermediate filament protein family, specifically the intermediate filament protein family Class III, which also includes peripherin, desmin and vimentin. The GFAP protein runs on gels at ~55kDa protein, usually associated with lower molecule weight bands which are thought to be proteolytic fragments and alternate transcripts from the single gene. GFAP is strongly and specifically expressed in astrocytes and certain other astroglia in the central nervous system, in satellite cells in peripheral ganglia, and in non-myelinating Schwann cells in peripheral nerves.

In many damage and disease states GFAP expression is heavily upregulated in astrocytes. In addition neural stem cells frequently strongly express GFAP. Antibodies to GFAP are therefore very useful as markers of astrocytic cells and neural stem cells. In addition many types of brain tumor, presumably derived from astrocytic cells, heavily express GFAP. Finally, Alexander's disease was recently shown to be caused by point mutations in protein coding region of the GFAP gene (2). All forms of Alexander disease are characterized by the presence of Rosenthal fibers, which are GFAP containing cytoplasmic inclusions found in astrocytes.

The antibody was made against native GFAP purified from bovine spinal cord tissue (3). This antibody has been used in several recent publications (see 4). The HGNC name for this protein is GFAP. The initial challenge was performed with a preparation of recombinant GFAP expressed in bacteria and highly purified. Subsequent boosts were performed with GFAP purified from a Triton X-100 extract of myelin associated material from bovine spinal cord, following an axonal flotation procedure (3). The GFAP was further purified by centrifugation and ion exchange chromatography in 6 M urea on DEAE cellulose.



Figures: Left: Western blot of whole rat brain extract (lane 1) and mouse brain extract (lane2) was probed with CPCA-GFAP, at dilution of 1:5,000. A prominent band running with an apparent SDS-PAGE molecular weight of ~50 kDa corresponds to GFAP. Note: molecular weight of GFAP protein in the mouse brain extract is lower than that in rat. Protein size marker is shown in red. **Right:** Mixed cultures of neurons and glia stained with CPCA-GFAP (red), and DNA (blue). Astrocytes stain strongly and specifically in a clearly filamentous fashion with this antibody.

Antibody characteristics: Antibody was raised in chicken against native GFAP purified from bovine spinal cord tissue. Antibody is provided as IgY preparation.

Suggestions for use: Try at dilutions of 1:1,000-5,000 for immunofluorescence and Western blots.

References:

1. Bignami A, Eng LF, Dahl D, Uyeda CT. Localization of the glial fibrillary acidic protein in astrocytes by immunofluorescence. Brain Res. 43:429-35 1972.

2. Brenner M, Johnson AB, Boespflug-Tanguy O, Rodriguez D, Goldman JE and Messing A. Mutations in GFAP, encoding glial fibrillary acidic protein, are associated with Alexander disease. Nat Genet 27:117-20 2001

3. Liem RKH, Yen SH, Salomon GD and Shelanski ML. Intermediate filaments in nervous tissues. J Cell Biol 79:637-745 (1978).

4. Bruijnzeel AW, Bauzo RM, Munikoti V, Rodrick GB, Yamada H, Fornal CA, Ormerod BK, Jacobs BL.Tobacco smoke diminishes neurogenesis and promotes gliogenesis in the dentate gyrus of adolescent rats. Brain Res. 1413:32-42 (2011).