4949 SW 41st Blvd.
Suites 40 & 50
Gainesville, FL 32608
Tel: (352) 372 7022
Fax: (352) 372 7066
admin@encorbio.com

Catalogue# Prot-r-GFAP-rat: Recombinant rat Glial Fibrillary Acidic Protein (GFAP)

Background: Glial Fibrillary Acidic Protein (GFAP) was discovered by Amico Bignami and coworkers as a major fibrous protein of multiple sclerosis plaques (2). 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 most common isotype of the GFAP protein runs on gels at ~55 kDa protein, usually associated with lower molecule weight bands which are proteolytic fragments and less abundant 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 the protein coding region of the GFAP gene (3). All forms of Alexander disease are characterized by the presence of Rosenthal fibers, which are GFAP containing cytoplasmic inclusions found in astrocytes. See also reference 4 for some important earlier work. There has been considerable recent interest in GFAP due to the potential use of this protein as a damage and degeneration biomarker, since it can be detected in blood and CSF following various kinds of CNS damage and disease states (5). Our recombinant form of GFAP is an excellent protein standard for such experiments in rodents. Since the human protein is somewhat different in primary sequence, we have also generated a recombinant form of that, PROT-r-GFAP. This form is therefore a more appropriate standard for studies of human traumatic and neurodegerative states. The HGNC name for this protein is GFAP.

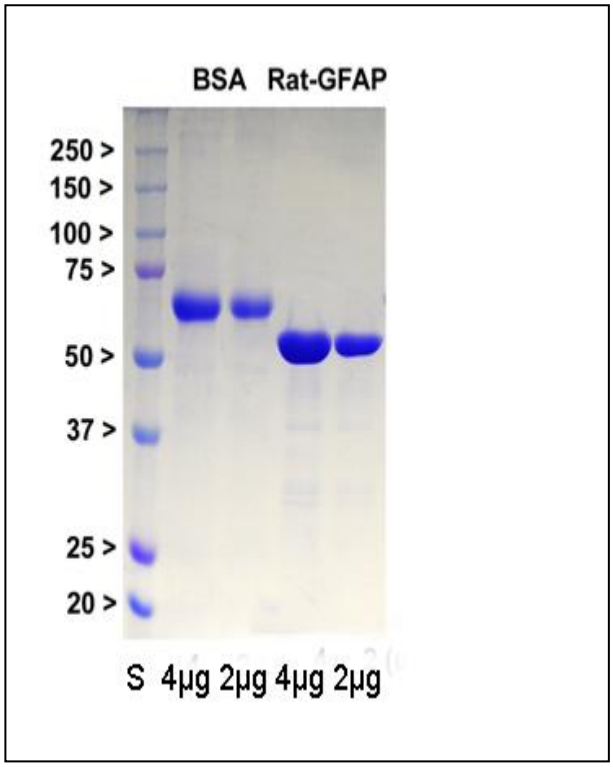

Figure: A cDNA encoding isotype I of rat GFAP was inserted into the pET29a expression vector which adds an C-terminal His-tag to the human sequence. The construct was expressed by standard methods and purified using a Nickel column in 6M urea, and we supply the protein in this form. 4µg and 2µg of the recombinant GFAP are in the two right lanes as indicated and 4µg and 2µg of BSA are in the two left lanes The lane on the far left contains protein standards of the indicated molecular size.

References:

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2. 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.

3. 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

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

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Limitations: This product is for research use only and is not approved for use in humans or in clinical diagnosis.