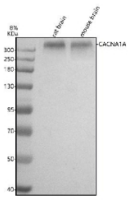
CACNA1A Antibody / Calcium voltage-gated channel subunit alpha1 A / Cav2.1 (FY12834)

Catalog No.	Formulation	Size
FY12834	Adding 0.2 ml of distilled water will yield a concentration of 500 ug/ml	100 ug

Bulk quote request

Availability	1-2 days
Species Reactivity	Mouse, Rat
Format	Lyophilized
Host	Rabbit
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit IgG
Purity	Immunogen affinity purified
Buffer	Each vial contains 4 mg Trehalose, 0.9 mg NaCl, 0.2 mg Na2HPO4.
UniProt	O00555
Applications	Western Blot: 0.25-0.5ug/ml ELISA: 0.1-0.5ug/ml
Limitations	This CACNA1A antibody is available for research use only.



Western blot analysis of CACNA1A using anti-CACNA1A antibody. Lane 1: rat brain tissue lysates, Lane 2: mouse brain tissue lysates. After electrophoresis, proteins were transferred to a nitrocellulose membrane at 150 mA for 50-90 minutes. Blocked the membrane with 5% non-fat milk/TBS for 1.5 hour at RT. The membrane was incubated with rabbit anti-CACNA1A antibody at 0.5 ug/ml overnight at 4oC, then washed with TBS-0.1%Tween 3 times with 5 minutes each and probed with a goat anti-rabbit IgG-HRP secondary antibody at a dilution of 1:5000 for 1.5 hour at RT. The signal was developed using enhanced chemiluminescent. CACNA1A western blot of rat and mouse brain shows a broad band at ~300-320 kDa, consistent with full-length Cav2.1 running higher than predicted due to extensive glycosylation and large membrane protein migration properties.

Description

CACNA1A antibody detects Calcium voltage-gated channel subunit alpha1 A (Cav2.1), a pore-forming subunit of the P/Q-type voltage-dependent calcium channel complex that mediates calcium influx into excitable cells. The UniProt

recommended name is Voltage-dependent P/Q-type calcium channel subunit alpha-1A (CACNA1A). This channel plays a critical role in neurotransmitter release, synaptic plasticity, and neuronal excitability in the central nervous system. Cav2.1 channels are primarily localized at presynaptic terminals where they regulate vesicular fusion and exocytosis in response to membrane depolarization.

The CACNA1A gene, located on chromosome 19p13, encodes a large transmembrane protein that forms the channel's alpha1 subunit. This subunit contains four homologous domains, each with six membrane-spanning segments, creating a central pore through which calcium ions pass. The channel's function is modulated by auxiliary beta and alpha2delta subunits that influence its gating properties, trafficking, and kinetics. Through tightly controlled calcium entry, Cav2.1 channels couple electrical activity to intracellular signaling, shaping neuronal communication and network function.

Physiologically, CACNA1A is highly expressed in cerebellar Purkinje cells, brainstem nuclei, and cortical neurons. It is essential for proper motor coordination, synaptic transmission, and cerebellar function. In neurons, P/Q-type calcium channels trigger the release of neurotransmitters such as glutamate, acetylcholine, and GABA, regulating synaptic strength and timing. CACNA1A activity is also implicated in dendritic calcium signaling and gene expression, linking membrane excitability to long-term neuronal adaptations.

Mutations in CACNA1A are associated with several neurological disorders, including familial hemiplegic migraine type 1 (FHM1), episodic ataxia type 2 (EA2), and spinocerebellar ataxia type 6 (SCA6). These mutations alter channel gating or expression, leading to abnormal calcium signaling and disrupted neurotransmission. Research using CACNA1A antibody has contributed to understanding how Cav2.1 dysfunction leads to motor incoordination, seizure susceptibility, and neurodegeneration. The antibody is valuable for studying channel localization, expression regulation, and structure-function relationships in both normal and disease states.

CACNA1A antibody is useful in immunohistochemistry, immunofluorescence, and related applications to detect neuronal calcium channels in brain and cultured neuron samples. It enables visualization of P/Q-type channel distribution and contributes to studies of synaptic physiology and channelopathies. NSJ Bioreagents provides CACNA1A antibody reagents optimized for neuroscience research focused on calcium signaling, synaptic transmission, and neuronal excitability.

Application Notes

Optimal dilution of the CACNA1A antibody should be determined by the researcher.

Immunogen

E.coli-derived human CACNA1A recombinant protein (Position: K251-D2157) was used as the immunogen for the CACNA1A antibody.

Storage

After reconstitution, the CACNA1A antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.

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