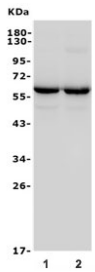
GAD65 Antibody Mouse Monoclonal 4E12 / GAD2 [clone 4E12.] (RQ5857)

Catalog No.	Formulation	Size
RQ5857	0.5mg/ml if reconstituted with 0.2ml sterile DI water	100 ug

Bulk quote request

Availability	1-3 business days
Species Reactivity	Mouse, Rat
Format	Antigen affinity purified
Host	Mouse
Clonality	Monoclonal (mouse origin)
Isotype	Mouse IgG1
Clone Name	4E12.
Purity	Affinity purified
Buffer	Lyophilized from 1X PBS with 2% Trehalose and 0.025% sodium azide
UniProt	Q05329
Applications	Western Blot : 0.5-1ug/ml
Limitations	This GAD65 antibody is available for research use only.



Western blot of GAD65 Antibody Mouse Monoclonal 4E12. Lane 1: rat brain lysate, Lane 2: mouse brain lysate. A band is detected at approximately 65 kDa, consistent with the predicted molecular weight of Glutamate decarboxylase 2 / GAD65. The strong signal in brain lysates aligns with the known neuronal enrichment of this GABA-synthesizing enzyme.

Description

Glutamate decarboxylase 2 is a pyridoxal phosphate-dependent enzyme encoded by the GAD2 gene and commonly referred to as GAD65. The GAD65 Antibody Mouse Monoclonal 4E12 is developed to detect this key gamma-aminobutyric acid synthesizing enzyme in central nervous system and neuroendocrine research applications. GAD2 is located on chromosome 10p11.23 and encodes the 65 kDa isoform of glutamate decarboxylase responsible for catalyzing the conversion of glutamate to gamma-aminobutyric acid, the principal inhibitory neurotransmitter in the brain.

GAD65 is predominantly expressed in GABAergic neurons, where it localizes to the cytoplasm and associates with synaptic vesicle membranes. In contrast to the related isoform GAD67 encoded by GAD1, which supports basal GABA synthesis, GAD2 is more closely linked to activity-dependent neurotransmitter production and regulated synaptic release. Immunohistochemical detection typically demonstrates cytoplasmic staining in neuronal cell bodies and processes within cortex, hippocampus, cerebellum, and other regions enriched for inhibitory interneurons. Most non-neuronal tissues exhibit minimal staining, reflecting the restricted neuronal distribution of GAD65.

Beyond the central nervous system, GAD2 expression is also present in pancreatic islet beta cells, where it contributes to local GABA signaling and functions as a major autoantigen in type 1 diabetes. Tissue-based detection of GAD65 supports studies mapping inhibitory neuronal populations in brain tissue and identifying neuroendocrine cell subsets in pancreatic sections. Altered expression has been investigated in epilepsy, neurodevelopmental disorders, and neurodegenerative conditions characterized by disrupted excitatory-inhibitory balance.

As a central enzyme in GABA biosynthesis, GAD2 plays an essential role in maintaining inhibitory tone and neural network stability. Clone 4E12 is a mouse monoclonal antibody developed for specific detection of GAD65 in formalin-fixed, paraffin-embedded specimens and other protein expression studies focused on inhibitory neuron identification and neuroendocrine tissue characterization.

For highly specific detection of GAD65 in inhibitory synaptic signaling studies, see our GAD65 Antibody / Synaptic GABA Marker Antibody page featuring clone GAD2/2362 with strong HuProt(TM) microarray specificity validation data.

Application Notes

Optimal dilution of the GAD65 antibody should be determined by the researcher.

Immunogen

Amino acids KVIDFHYPNELLQEYNWELADQPQNLEEILMHCQ from the human protein were used as the immunogen for the GAD65 antibody mouse monoclonal 4E12.

Storage

After reconstitution, the GAD65 antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.