

GABA(A) Receptor Family

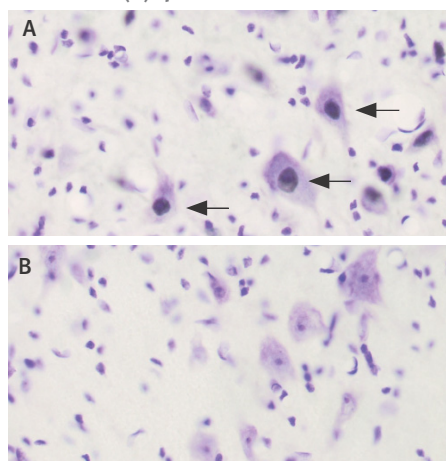
Ofra Gohar, Ph.D.

GABA (γ -aminobutyric acid) is the major inhibitory neurotransmitter in the brain. Its production, release, reuptake and metabolism occur in the nervous system. The GABA transmitter interacts with two major types of receptors: ionotropic GABA_A and the metabotropic GABA_B receptors. The GABA_A receptor belongs to the ligand gated channel superfamily.

The neurotransmitter GABA (γ -aminobutyric acid) inhibits the activity of signal-receiving neurons by interacting with the GABA(A) receptor on these cells¹ There are two major types of GABA receptors: the ionotropic GABA(A) and the metabotropic GABA(B) receptors.

GABA(A) receptor belongs to the ligand gated ion channel superfamily.^{1,2} It is a heteropentamer, with all of its five subunits contributing to the pore formation. Eight subunit isoforms have been cloned: α , β , γ , δ , ϵ , π , θ and ρ .¹ The native GABA(A) receptor, in most cases, consists of 2 α , 2 β and 1 γ subunits. The binding of GABA to its GABA(A) receptor results in conformational changes that open a Cl⁻ channel, producing an increase in membrane conductance, resulting in inhibition of neural activity.^{2,3} Recently, a genetic linkage between familial epilepsy syndrome and mutations in the γ 2 subunit of the GABA(A) receptor has been demonstrated.^{4,5}

Anti-GABA(A) γ 2



Staining with rabbit Anti-GABA(R) γ 2 antibody (#AGA-005) in rat dorsal pons and cresyl violet counterstain (pink-purple). Neuronal nuclei were visualized (A, ARROWS). This pattern was completely blocked by pre-incubation with the antigen (B).

References:

- Mihic, S.J. *et al.* (1997) *Neurotransmit. Rev.* **21**, 127.
- Whiting, P.J. (1999) *Neurochem. Inter.* **34**, 387.
- Ashcroft, F.M. (2000), *Ion Channels and Disease*, Ed 1.
- Wallace, R.H. *et al.* (2001) *Nat. Genet.* **28**, 49.
- Baulac, S. *et al.* (2001) *Nat. Genet.* **28**, 46.

Related Products

Compound	Product #
Anti-GABA (A) α 1	AGA-001
Anti-GABA (A) α 2	AGA-002
Anti-GABA (A) α 3	AGA-003
Anti-GABA (A) α 6	AGA-004
Anti-GABA (A) γ 2	AGA-005

Anti-GABA(A) α 6

(Gamma-aminobutyric-acid receptor type A α 6 subunit, GABRA6) Extracellular

Product #: AGA-004

NEW

Host: Rabbit.

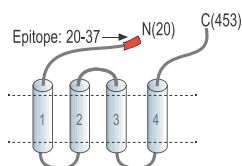
Epitope: Peptide QLEDEGNFYSENVSRILDN(C) corresponding to amino acid residues 20-37 of rat GABA(A) α 6.

Putative epitope location:

N-terminus, Extracellular.

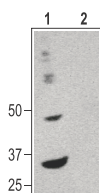
Homology with other species:

mouse - identical, human (17/19 residues identical).



Applications:

Western Blotting:



Western blotting of rat brain membranes:

- Anti-GABA(A) α 6 antibody (#AGA-004) (1:200).
- Anti-GABA(A) α 6 antibody, preincubated with the control peptide antigen.

Anti-GABA(A) γ 2

(Gamma-aminobutyric-acid receptor type γ 2 subunit) Extracellular

Product #: AGA-005

NEW

Host: Rabbit.

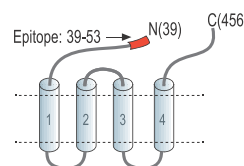
Epitope: Peptide QKSDDDYEDYASNKT(C), corresponding to residues 39-53 of rat GABA(A) γ 2.

Putative epitope location:

Extracellular, N-terminus.

Homology with other species:

Human, mouse, bovine-identical; Chick (13/15 residues identical).

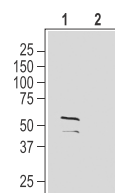


Applications:

Immunohistochemistry:

Rat brain formaline-fixed frozen section.

Western Blotting:



Western blotting of rat brain membrane:

- Anti-GABA(A) γ 2 antibody (#AGA-005) (1:200).
- Anti-GABA(A) γ 2 antibody, preincubated with the control peptide antigen.

Anti-GABA(A) α 1

(Gamma-aminobutyric-acid receptor type A α 1 subunit, GABRA1) Extracellular

Product #: AGA-001

Host: Rabbit.

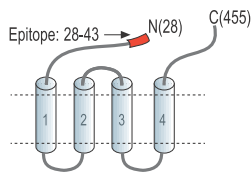
Epitope: Peptide QPSQDELKDNTTVFTR(C), corresponding to amino acid residues 28-43 of rat GABA(A) α 1.

Putative epitope location: Extracellular, N-terminus.

Homology with other species:

Mouse - identical; human, bovine (16/17 residues identical), chicken (14/17 residues identical).

Homology with other isoforms: α 5 and α 2 subunits (respectively, 9/16 and 8/16 residues identical).

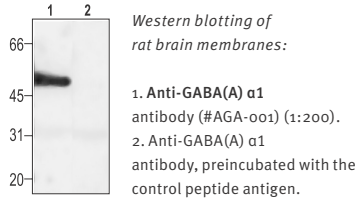


Applications:

Immunohistochemistry:

Rat brain frozen sections.

Western Blotting:



Anti-GABA(A) α 2

(Gamma-aminobutyric-acid receptor type A α 2 subunit, GABRA2)

Product #: AGA-002

Host: Rabbit.

Epitope: Peptide (C)TPEPNKKPENKPA, corresponding to amino acid residues 393-405 of rat GABA(A) α 2.

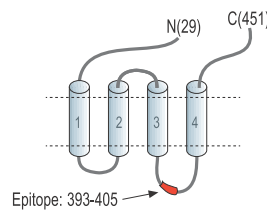
Putative epitope location:

Intracellular, 2nd cytoplasmic loop.

Homology with other species:

Mouse, human, bovine- identical.

Homology with other isoforms: α 1 and α 5 subunits (respectively, 8/13 and 6/13 residues identical).

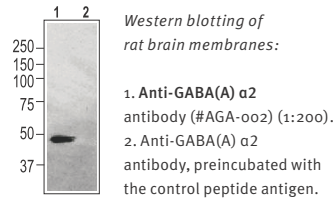


Applications:

Immunohistochemistry:

Mouse cerebellum formaline-fixed frozen section.

Western Blotting:



Anti-GABA(A) α 3

(Gamma-aminobutyric-acid receptor type A α 3 subunit, GABRA3) Extracellular

Product #: AGA-003

Host: Rabbit.

Epitope: peptide QGESRRQEPGDFVKQ (C), corresponding to residues 29-43 of human GABA(A) α 3.

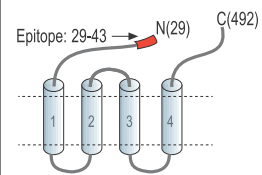
Putative epitope location:

Extracellular, N-terminus.

Homology with other species:

Rat, mouse - identical;

bovine - 14/15 residues identical.



Applications:

Immunohistochemistry:

Rat brain frozen sections.

Western Blotting:

