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# DATASHEET

Anti-GluA$_{1-4}$ (pan-AMPAR) antibody ValidAb$^{TM}$

## Product overview

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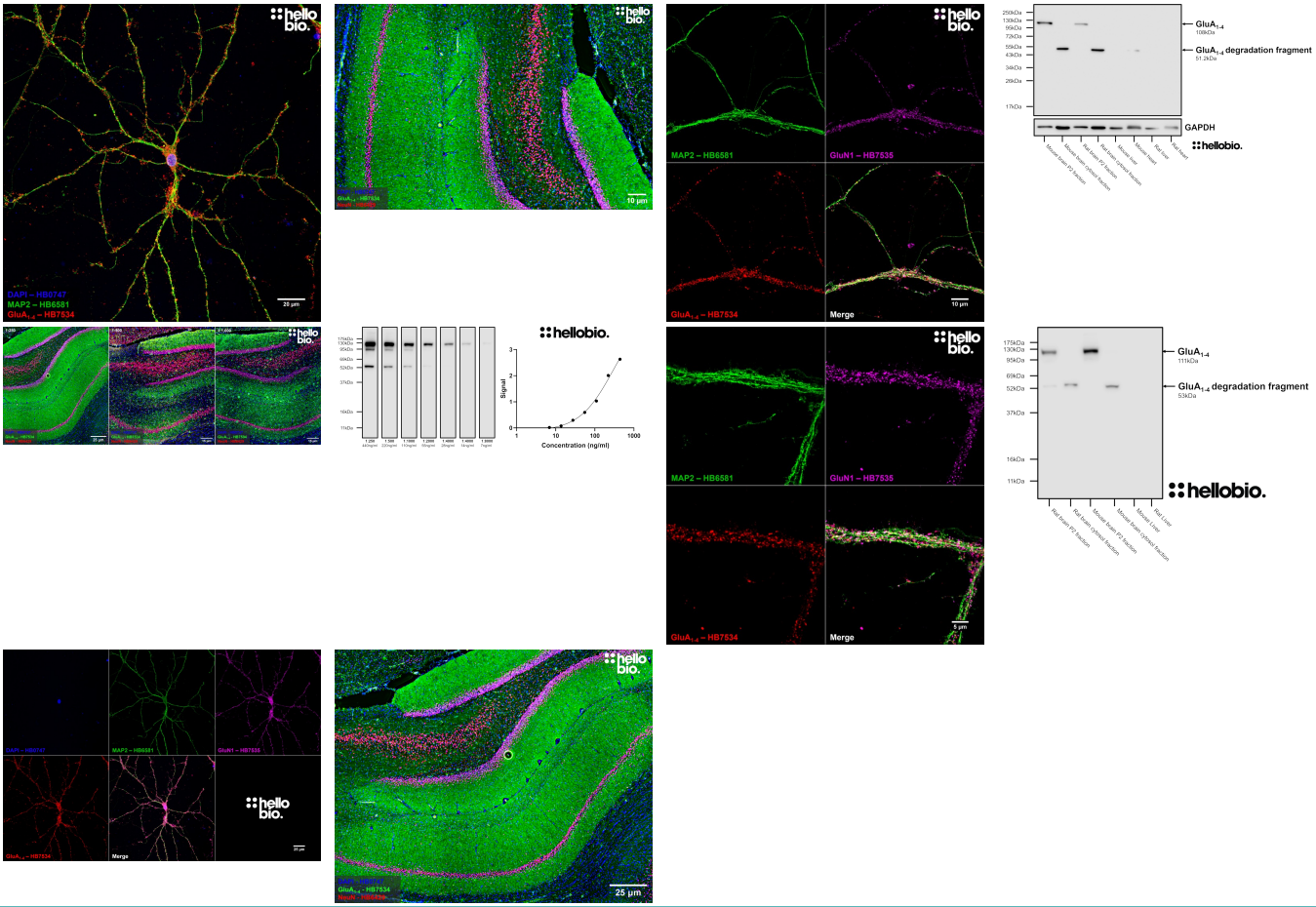
| **Name** | Anti-GluA$_{1-4}$ (pan-AMPAR) antibody ValidAb$^{TM}$ |
| **Cat No** | HB7534 |
| **Host** | Rabbit |
| **Clonality** | Polyclonal |
| **Target** | GluA$_{1-4}$ |
| **Description** | Antibody to GluA$_{1-4}$ (pan-AMPAR). Part of the ValidAb™ range of highly validated, data-rich antibodies. |

## Validation data




## Product information

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| **Immunogen** | Fusion protein expressed in and purified from *E.coli* consisting of residues 724-781 of GluR1$_{flop}$ conjugated to Glutathione-S-transferase (GST) |
| **Purification** | Dual stage immunogen affinity purification consisting of a first stage to remove GST reactive antibodies and a second stage to purify only specific anti-GluA$_{1-4}$ antibodies. |
| **Concentration** | 0.11mg/ml |

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| **Formulation** | Lyophilised, When reconstituted contains PBS with 1% recombinant human albumin and 0.05% sodium azide |
| **Predicted species reactivity** | Mouse, Rat |
| **Tested species reactivity** | Mouse, Rat |

## Tested applications

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| **Applications** | ICC, WB, IHC(IF) |
| **Western blot optimal concentration** | 1:2000 dilution as tested in a rat brain P2 membrane preparation |
| **IHC(IF) optimal concentration** | 1:250 dilution as tested in rat brain hippocampal sections. Please note that utilisation of a citrate antigen retrieval protocol is required for successful staining. |
| **ICC optimal concentration** | 1:1,000 dilution as tested in cultured rat hippocampal neurons. Please note that antigen retrieval is required for successful staining (we recommend 100mM Tris, 5% Urea, pH9.5, 95°C) |
| **Positive control** | AMPAR receptors are widely expressed in the brain therefore neural tissues serve as an excellent positive control. |
| **Negative control** | Tissues such as the liver and heart lack AMPA expression while popular cell lines such as HeLa and HEK293 also lack expression therefore are good negative controls. |
| **Open data link** | Please follow this link to OSF |

## Target information

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| **Other names** | pan-AMPA, $GluR_{1-4}$, $GRIA_{1-4}$ |
| **UniProt ID** | P42261, P42262, P42263, P48058 |
| **Gene name** | GRIA1, GRIA2, GRIA3, GRIA4 |
| **NCBI full gene name** | glutamate ionotropic receptor AMPA type subunit 1, glutamate ionotropic receptor AMPA type subunit 2, glutamate ionotropic receptor AMPA type subunit 3, glutamate ionotropic receptor AMPA type subunit 4 |
| **Entrez gene ID** | $GluA_1$: 2890<br>$GluA_2$: 2891<br>$GluA_3$: 2892<br>$GluA_4$: 2893 |
| **Amino acids** | $GluA_1$: 906 amino acids, 101.5kDa<br>$GluA_2$: 883 amino acids, 98.8kDa<br>$GluA_3$: 894 amino acids, 101.1kDa<br>$GluA_4$: 902 amino acids, 100.9kDa |
| **Isoforms** | AMPA receptors are subject to alternative splicing resulting in two variants known as flip and flop (see Sommer et al., 1990 for more information). While there is evidence that these different isoforms have different functional properties both isoforms for each receptor have the same number of amino acids and therefore almost identical molecular weights. |
| **Expression** | AMPA receptors are widely expresed in the CNS with particularly high expression in the hippocampus, cortex and cerebellum. AMPA receptors have also been found to be expressed in peripheral tissues where they regulate insulin release (see Wu et al., 2012). |
| **Subcellular expression** | AMPA receptors are primarily expressed within both the pre and post-synaptic densities found within the axon terminals and dendrites of neurones respectively. |
| **Target function** | AMPA receptors are the main excitatory neurotransmitter receptor in the CNS and upon glutamate binding allow $Na^+$ and $Ca^{2+}$ ions to enter the cell and cause depolarization. |
| **Processing** | All AMPA receptor isoforms contain a N-terminal signal peptide which drives their translocation to the cell membrane. |
| **Post translational modifications** | All AMPA receptor isoforms are subject to glycosylation on multiple residues with GluA1 and GluA2 also being subject to phosphorylation at multiple sites too. |
| **Homology (compared to human)** | $GluA_1$: Mouse and rat show 97.8% and 98.6% homology to the human homologue respectively<br>$GluA_2$: Mouse and rat show 99.7% and 99.6% homology to the human homologue respectively<br>$GluA_3$: Mouse and rat show 98.5% and 99.4% homology to the human homologue respectively<br>$GluA_4$: Mouse and rat show 99.7% and 98.2% homology to the human homologue respectively |
| **Epitope homology (between species)** | A BLAST search using the immunogen sequence shows the following homologies for each species against each receptor target: |

| Receptor | Species | | |
|---|---|---|---|
| | Human | Mouse | Rat |
| GluA1 | 100.0% | 93.1% | 100.0% |
| GluA2 | 96.6% | 94.8% | 94.8% |
| GluA3 | 96.6% | 93.1% | 94.8% |
| GluA4 | 89.7% | 89.7% | 91.4% |

**Epitope homology (other proteins)** A BLAST search using the immunogen sequence against all human targets provides the following proteins with significant homology:

- GluA1 - 100.0% homology
- GluA2 - 96.6% homology
- GluK3 - 48.3% homology
- GluK4 - 50.0% homology

- GluA3 - 96.6% homology
- GluA4 - 89.7% homology
- GluK1 - 48.3% homology
- GluK2 - 46.6% homology
- GluK5 - 48.3% homology
- GluD1 - 44.0% homology
- GluD3 - 37.3% homology
- GluN2D - 34.0% homology

## Storage & Handling

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| **Storage instructions** | -20°C then use reconstitution advice |
| **Reconstitution advice** | Upon receipt store at either -20°C or -80°C.<br><br>For 100µg packs either:<br><br>• Reconstitute with 100µl $dH_2O$ and store at 4°C<br>• Reconstitute with 50µl $dH_2O$ and 50µl glycerol then store at -20°C<br>• Reconstitute with 100µl $dH_2O$, aliquot then snap freeze and store at -80°C<br><br>For 25µg packs either:<br><br>• Reconstitute with 25µl $dH_2O$ and store at 4°C<br>• Reconstitute with 12.5µl $dH_2O$ and 12.5µl glycerol then store at -20°C<br>• Reconstitute with 25µl $dH_2O$, aliquot then snap freeze and store at -80°C<br><br>For more information read our guide on the best care for your product. Take care when opening as the precipitate is extremely light and can easily be lost if disturbed. When reconstituting make sure that the antibody is thoroughly dissolved by pipetting up and down before giving the antibody a brief spin at 10,000g to make sure that all material is recovered and at the bottom of the tube. |
| **Shipping conditions** | The stability of this product allows for safe shipment at ambient temperature. Please follow the recommended storage conditions upon receipt. |
| **Important** | This product is for RESEARCH USE ONLY and is not intended for therapeutic or diagnostic use. Not for human or veterinary use |

## References


**Cell type and pathway dependence of synaptic AMPA receptor number and variability in the hippocampus.**

Nusser Z et al (1998) Neuron 21
**PubMedID** 9768841

**Developmental and activity dependent regulation of ionotropic glutamate receptors at synapses.**

Molnar E et al (2002) TheScientificWorldJournal 2
**PubMedID** 12806037

**High-resolution immunogold localization of AMPA type glutamate receptor subunits at synaptic and non-synaptic sites in rat hippocampus.**

Baude A et al (1995) Neuroscience 69
**PubMedID** 8848093