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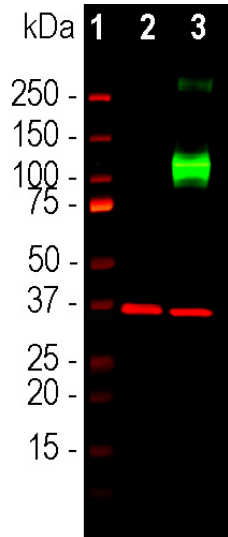
HGNC Name: ADCY3
UniProt: P21932
RRID: AB_2572219
Immunogen: C-terminal peptide of rat ACIII, PAAFPNGSSVTLPHQVVDNP with a Cys added to the N-terminus to allow coupling to KLH.
Format: Affinity Purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM Na₂S₂O₈
Storage: Store at 4°C for short term, for longer term store at -20°C
Recommended dilutions:
WB: 1:1,000. IF/ICC or IHC: 1:10,000-20,000.

References:

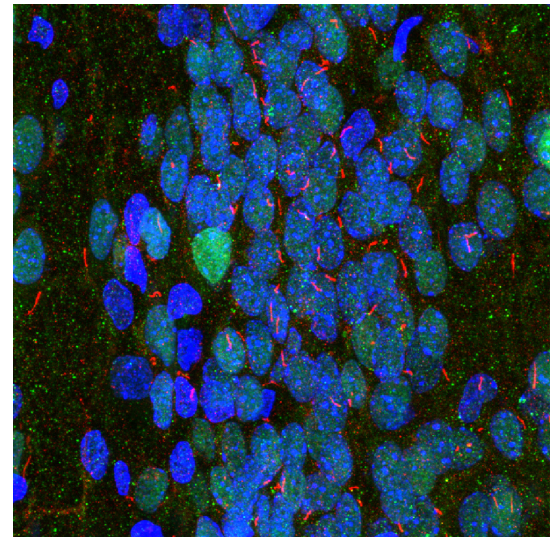
1. Fuchs JL, Schwark HD. Neuronal primary cilia: a review. *Cell Biol. Int.* 28:111-8 (2004).
2. Louvi A and Grove EA. Cilia in the CNS: the quiet organelle claims center stage. *Neuron* 69:1046-60 (2011).
3. Singla V, Reiter JF. The primary cilium as the cell's antenna: signaling at a sensory organelle. *Science* 313:629-33 (2006).
4. Green JA, Mykytyn K. Neuronal Primary Cilia: An Underappreciated Signaling and Sensory Organelle in the Brain. *Neuropsychopharm.* 39:244-5 (2014).
5. May-Simera HL, Kelley MW. Cilia, Wnt signaling, and the cytoskeleton. *Cilia* 2;1:7 (2012).
6. Gomez-Gamboa A, et al. Primary cilia in the developing and mature brain. *Neuron* 82:511-21 (2014).
7. Guadiana SM, et al. Arborization of Dendrites by developing neocortical neurons is dependent on primary cilia and Type 3 adenylyl cyclase. *J. Neurosci.* 33:2626-38 (2013).

This antibody has been cited in peer reviewed literature, see the CiteAb link [here](#).

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
WB, IF/ICC, IHC	Rabbit		130-200kDa by SDS-PAGE	Hu, Rt, Ms



Western blot analysis of HEK293 cell lysates using rabbit pAb to ACIII, RPCA-ACIII, dilution 1:2,000, in green: [1] protein standard, [7] non-transfected HEK293 cells, and [8] HEK293 cells transfected with an expression construct containing a Myc-DDK tagged full length human adenylate cyclase III cDNA. The strong band at about 130kDa in the transfected cells demonstrates overexpression of the human ACIII protein, and the bands over 250kDa presumably correspond to either glycosylated or aggregated forms of ACIII. The same blot was simultaneously probed with mouse mAb to GAPDH, MCA-1D4, dilution 1:5,000, in red, which reveals the single band at ~37kDa in both transfected and non-transfected cells.



Immunofluorescence analysis of rat hippocampus section stained with rabbit pAb to adenylate cyclase III, RPCA-ACIII, in red and costained with mouse mAb to MECP2, MCA-5H12, in green. The blue is DAPI staining of nuclear DNA. The ACIII antibody reveals neuronal cilia while the MECP2 antibody reveals the nuclei of certain neurons to a variable degree. This is a stacked confocal image made with a 100X objective lens.

Background:

G-protein coupled receptors are a large and variable family of membrane proteins. On binding their specific ligand they activate specific members of the family of trimeric G-proteins which in turn activate other signaling enzymes. Adenylate cyclases are one of these and are activated by the GTP bound GαS subunits of trimeric G-proteins. Adenylate cyclases are responsible for the production of the important "second messenger" signaling molecule cyclic-AMP which in turn activates the cAMP dependent protein kinase. This kinase phosphorylates numerous substrate molecules on serine or threonine residues and so alters their activity. There are several different adenylate cyclase genes and protein products with each have distinctly different distribution patterns in cells and tissues. The type III adenylate cyclase enzyme is specifically localized in the membranes surrounding neuronal cilia, and is activated by specific G-protein coupled receptors also located in cilia (1-5). Neuronal cilia express a variety of other receptors types and mediators of other signaling pathways and appear to function as a unique and complex neuronal sensory structure (1-5). For examples, the somatostatin 3 receptor, neuropeptide Y 2 receptor and melanin concentrating hormone receptor 1 are localized in neuronal cilia and the sonic hedgehog and Wnt signaling pathway act on neurons primarily through neuronal cilia (6).

The RPCA-ACIII antibody was made against the extreme C-terminal peptide of rat ACIII, PAAFPNGSSVTLPHQVVDNP, amino acids 1125-1144 of the Genbank entry [NP_570135.2](#). A cysteine residue was added to the N-terminus to allow coupling to MBS-activated keyhole limpet hemocyanin. The antibody works on mouse cells which express the same peptide and also on human cells, presumably because the corresponding peptide in the human AC3 sequence is the closely related peptide LATFPNGPSVTLPHQVVDNS. In line with this the antibody binds full length transfected human ACIII on western blots. The antibody works well to identify neuronal cilia on human and rodent cells. We have also generated a mouse monoclonal and a chicken polyclonal antibody to the same ACIII peptide, MCA-1A12 and CPCA-ACIII.

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Abbreviation Key:

mAb—Monoclonal Antibody **pAb**—Polyclonal Antibody **WB**—Western Blot **IF**—Immunofluorescence **ICC**—Immunocytochemistry
IHC—Immunohistochemistry **E**—ELISA **Hu**—Human **Mo**—Monkey **Do**—Dog **Rt**—Rat **Ms**—Mouse **Co**—Cow **Pi**—Pig **Ho**—Horse **Ch**—Chicken
Dr—*D. rerio* **Dm**—*D. melanogaster* **Sm**—*S. mutans* **Ce**—*C. elegans* **Sc**—*S. cerevisiae* **Sa**—*S. aureus* **Ec**—*E. coli*.

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mAb—Monoclonal Antibody pAb—Polyclonal Antibody WB—Western Blot IF—Immunofluorescence ICC—Immunocytochemistry IHC—Immunohistochemistry E—ELISA Hu—Human Mo—Monkey Do—Dog Rt—Rat Ms—Mouse Co—Cow Pi—Pig Ho—Horse Ch—Chicken Dr—D. rerio Dm—D. melanogaster Sm—S. mutans Ce—C. elegans Sc—S. cerevisiae Sa—S. aureus Ec—E. coli.