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#92516

# ApoE Synaptic Formation and Signaling Pathway Antibody Sampler Kit



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For Research Use Only. Not For Use In Diagnostic Procedures.

Product Includes	Product #	Quantity	Mol. Wt.	Isotype/Source
LRP1 (E2Q7S) Rabbit mAb	26387	20 µl	85 kDa	Rabbit IgG
ApoE (pan) (D719N) Rabbit mAb	13366	20 µl	35 kDa	Rabbit IgG
PSD95 (D27E11) XP® Rabbit mAb	3450	20 µl	95 kDa	Rabbit IgG
Phospho-PSD95 (Ser295) (A8F8Z) Rabbit mAb	45737	20 µl	95 kDa	Rabbit IgG
Synapsin-1 (D12G5) XP® Rabbit mAb	5297	20 µl	77 kDa	Rabbit IgG
AMPA Receptor 1 (GluA1) (D4N9V) Rabbit mAb	13185	20 µl	100 kDa	Rabbit IgG
Phospho-AMPA Receptor 1 (GluA1) (Ser831) (A5O2P) Rabbit mAb	75574	20 µl	100 kDa	Rabbit IgG
CREB (48H2) Rabbit mAb	9197	20 µl	43 kDa	Rabbit IgG
Phospho-CREB (Ser133) (87G3) Rabbit mAb	9198	20 µl	43 kDa	Rabbit IgG
Anti-rabbit IgG, HRP-linked Antibody	7074	100 µl		Goat

See [www.cellsignal.com](http://www.cellsignal.com) for individual component applications, species cross-reactivity, dilutions, and additional application protocols.

**Description:** The ApoE Synaptic Formation and Signaling Pathway Antibody Sampler Kit provides an economical means of detecting key synaptic signaling pathways in response to ApoE-mediated LRP1 activation by western blot. The kit includes enough antibodies to perform at least two western blot experiments with each primary antibody.

**Background:** Low density lipoprotein receptor related protein 1 (LRP1) is a type I transmembrane receptor that mediates the endocytosis of various ligands, including apolipoproteins and tau. Both proteins are genetically and pathologically linked to Alzheimer's disease (AD) (1,2). Human apolipoprotein E (ApoE) is a component of circulating lipoproteins when three human genetic ApoE variants, ApoE2, ApoE3, and ApoE4, exhibit distinct receptor-binding properties and differentially contribute to AD progression through a cellular mechanism that is poorly understood (2). Altered synaptic signaling is one proposed mechanism that contributes to altered neuronal function, which correlates with disease (3-5). Postsynaptic Density protein 95 (PSD95) is a member of the membrane-associated guanylate kinase (MAGUK) family of proteins that functions as a scaffolding protein to promote assembly and function of the postsynaptic density complex (6,7). At the presynapse, synapsins function to regulate neurotransmitter release (8,9). Dynamic phosphorylation of PSD95 at Ser295 reflects synaptic signaling that may alter synaptic function (10). In addition to PSD95, postsynaptic glutamate receptors, including AMPA-( $\alpha$ -amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid) receptors, can be directly phosphorylated. Phosphorylation of AMPA Receptor 1 (GluA1) at either Ser831 or Ser845 alters AMPA receptor ion channel function to change synaptic efficacy (11). CREB is a bZIP transcription factor that activates target genes through cAMP response elements. CREB is activated by phosphorylation at Ser133 by various signaling pathways including Erk, Ca<sup>2+</sup>, stress signaling, as well as synaptic signaling (3).

**Specificity/Sensitivity:** Each total antibody in the ApoE Synaptic Formation and Signaling Pathway Antibody Sampler Kit detects endogenous levels of its target protein. LRP1 (E2Q7S) Rabbit mAb detects endogenous levels of the  $\beta$  subunit of LRP1. ApoE (pan) (D719N) Rabbit mAb also recognizes overexpressed ApoE2, ApoE3, and ApoE4 proteins. CREB (48H2) Rabbit mAb does not cross-react with other ATF/CREB family members. The antigen for Synapsin-1 (D12G5) XP® Rabbit mAb is 100% conserved between human synapsin-1a and synapsin-1b. Each phospho-specific antibody in the ApoE Synaptic Formation and Signaling Pathway Antibody Sampler Kit detects endogenous levels of CREB only when phosphorylated at Ser133, PSD95 protein only when phosphorylated at Ser295, and AMPA Receptor 1 (GluA1) protein only when phosphorylated at Ser831. Phospho-CREB (Ser133) (87G3) Rabbit mAb also detects the phosphorylated form of the CREB-related protein, ATF-1. While Phospho-AMPA Receptor 1 (GluA1) (Ser831) (A5O2P) Rabbit mAb refers to Ser831, consistent with the literature, it is Ser849 in the UniProt sequence P42261.

**Source/Purification:** Monoclonal antibodies to total proteins are produced by immunizing animals with synthetic peptides corresponding to residues surrounding Leu4488 of human LRP1 protein, Pro285 of human ApoE protein, Gln53 of human PSD95 protein, Gln483 of human synapsin-1 protein, Ala275 of human AMPA Receptor 1 (GluA1) protein, and recombinant protein specific to the amino terminus of human CREB-1 protein. Phospho-specific monoclonal antibodies are produced by immunizing animals with synthetic phosphopeptides corresponding to residues surrounding Ser295 of human PSD95 protein, Ser831 of human AMPA Receptor 1 (GluA1) protein, and Ser133 of human CREB protein.

**Storage:** Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA, 50% glycerol and less than 0.02% sodium azide. Store at -20°C. Do not aliquot the antibodies.

Please visit [www.cellsignal.com](http://www.cellsignal.com) for validation data and a complete listing of recommended companion products.

#### Background References:

- (1) Rauch, J.N. et al. (2020) *Nature* 580, 381-385.
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- (4) Huang, Y.A. et al. (2019) *J Neurosci* 39, 7408-7427.
- (5) Lane-Donovan, C. and Herz, J. (2017) *Trends Endocrinol Metab* 28, 273-284.
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