SANTA CRUZ BIOTECHNOLOGY, INC.

Arc (E-7): sc-55475

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

Growth factor stimulation has been shown to induce the expression of immediate early genes in non-neuronal cells, which encode a variety of molecules that are potentially involved in long-term cellular responses. Similar responses induced by neurotransmitter stimulation have also been seen in neuronal cells and evidence suggests that protein synthesis is required for long-term synaptic plasticity. Arc (for activity-regulated cytoskeleton-associated protein) is a growth factor and immediate early gene that is enriched in brain. Arc mRNA and protein levels are induced by neuronal activity, which is necessary to stimulate neuroplasticity, indicating a potential role for Arc in activity-dependent changes in dendrite function. Arc expression has been detected in neuronal cell bodies and dendrites in the hippocampus, amygdala, hypothalamus, striatum and cortex. Arc has been shown to localize to the cyto-skeleton of neuronal cells and appears to co-localize with F-Actin, although it may associate with an Actin-associated protein rather than directly with F-Actin. It has been shown that cocaine-stimulated neuronal activity results in increased Arc mRNA levels in striatum.

REFERENCES

1. Greenberg, M.E., et al. 1986. Stimulation of neuronal acetylcholine receptors induces rapid gene transcription. Science 234: 80-83.
2. Montarolo, P.G., et al. 1986. A critical period for macromolecular synthesis in long-term heterosynaptic facilitation in *Aplysia*. Science 234: 1249-1254.
3. Lau, L.F. and Nathans, D. 1991. Genes induced by serum growth factors. In Cohen, P. and Foulkes, J.G., eds. The Hormonal Control of Gene Transcription Vol. 6: Molecular Aspects. Amsterdam: Elseveier Science Publishers, 257-293.
4. Lyford, G.L., et al. 1995. Arc, a growth factor and activity-regulated gene, encodes a novel cytoskeleton-associated protein that is enriched in neuronal dendrites. Neuron 14: 433-435.
5. Fosnaugh, J.S., et al. 1995. Activation of Arc, a putative "effector" immediate early gene, by cocaine in rat brain. J. Neurochem. 64: 2377-2380.

CHROMOSOMAL LOCATION

Genetic locus: ARC (human) mapping to 8q24.3; Arc (mouse) mapping to 15 D3.

SOURCE

Arc (E-7) is a mouse monoclonal antibody rasied against amino acids 1-300 of Arc of human origin.

PRODUCT

Each vial contains 200 µg IgG_{2a} kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

APPLICATIONS

Arc (E-7) is recommended for detection of Arc of mouse, rat and human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for Arc siRNA (h): sc-29721, Arc siRNA (m): sc-29724, Arc shRNA Plasmid (h): sc-29721-SH, Arc shRNA Plasmid (m): sc-29724-SH, Arc shRNA (h) Lentiviral Particles: sc-29721-V and Arc shRNA (m) Lentiviral Particles: sc-29724-V.

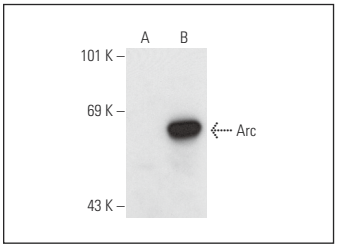
Molecular Weight of Arc: 55 kDa.

Positive Controls: Arc (h2): 293T Lysate: sc-170557, rat brain extract: sc-2392 or U-937 cell lysate: sc-2239.

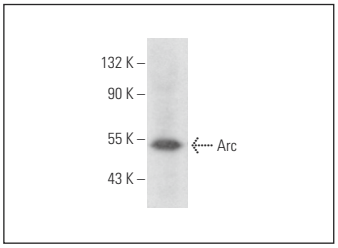
RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgGκ BP-HRP: sc-516102 or m-IgGκ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml). 3) Immunofluorescence: use m-IgGκ BP-FITC: sc-516140 or m-IgGκ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

DATA



Arc (E-7): sc-55475. Western blot analysis of Arc expression in non-transfected: sc-117752 (**A**) and human Arc transfected: sc-170557 (**B**) 293T whole cell lysates.



Arc (E-7): sc-55475. Western blot analysis of Arc expression in rat brain tissue extract.

SELECT PRODUCT CITATIONS

1. Park, A.Y., et al. 2019. Activity-regulated cytoskeleton-associated protein (Arc/Arg3.1) is transiently expressed after heat shock stress and suppresses heat shock factor 1. Sci. Rep. 9: 2592.
2. Gharami, K. and Biswas, S.C. 2019. Glutamate treatment mimics LTP- and LTD-like biochemical activity in viable synaptosome preparation. Neurochem. Int. 134: 104655.

RESEARCH USE

For research use only, not for use in diagnostic procedures.