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Antibodies to Cell Cycle and Cellular Trafficking Targets

Dynamin-related Protein 1 (DRP1) antibodies (Cat DRP1-101AP, P-DRP1 and PC-DRP1)

Other Nomenclature: Dnm1p/Vps1p-like protein, Dynamin-like protein 4, Dynamin family member proline-rich carboxyl-terminal domain less

Mitochondria are dynamic organelles that frequently move, divide, and fuse with one another to maintain their architecture and functions. Changes in mitochondrial morphology is tightly coupled with cell cycle, differentiation and death, these physiological phenomenon are regulated by the balance between mitochondrial fusion and fission process. Any disruption in dynamic equilibrium between fusion and fission due to cell injury or death may contribute to developmental and neurodegenerative disorders. Inhibition of fusion caused machinery can caused excessive fragmentation that led to dysfunctional organelle. Calcineurin dependent translocation of a pro-fission protein dynamin related protein 1 (Drp1) to mitochondria was observed in dysfunction-induced fragmentation. Drp1 interacts with cytosolic phosphatase calcineurin during mitochondrial depolarization due to sustained cytosolic Ca increase. The translocation of Drp1 is dependent upon calcineurin-dependent dephosphorylation of serine 637 of Drp1 (1). In neurons and in HeLa cells the CaMKI alpha-dependent phosphorylation of Ser600 by of Drp1 resulted in increased trans location of Drp1 in to mitochondria (2). Fragmentation of mitochondria triggered by dysfunction of the Drp1 protein led to synaptic damage and subsequent neuronal loss and impaired bioenergetics. Excessive fragmentation results in abnormally small mitochondria with broken cristae as observed in electron microscopy of neurons from studies of Alzheimer's disease (3). Recent studies have suggested that Drp1 undergo S-Nitrosylation which regulate its activity to induce mitochondrial fission and neuronal damage in a NO mediated fashion (4). It is suggested that NO produced in response to beta-amyloid protein play a key role in mitochondrial fission, synaptic loss and neuronal damage in Alzheimer disease via S-nitrosylation of Drp1 forming SNO-Drp1 (4). Increased concentration of SNO-Drp1 is found in Alzheimer's brain which may contribute to the pathogenesis of neuro-degeneration. Preventing nitrosylation of Drp1 abrogates the neurotoxic events. Drp1 (736 aa) is a highly conserved protein among humans, rat, mouse and fly genome. The protein has a amino terminal Ras-like GTPase superfamily domain, a Dynamin-M domain and a GED domain.

FabGennix has made and characterized an antibody against Dynamin-related protein 1 (Drl1) in rabbit, this antibody cross reacts with mouse, rat, human and fruit fly Drp1 protein. The Drp1 antibodies are affinity purified over immobilized antigen affinity matrix and stabilized in the presence of preservatives for long-term storage. FITC-Drp1 conjugated antibody was further purified to remove un-conjugated fluorophore was stabilized for long-term storage. FabGennix will conjugate this antibody to secondary enzymes (alkaline phosphatase or horseradish peroxidase) and other fluorophores upon request at a nominal charge. FabGennix Int. Inc. stocks limited quantities of western blot positive controls for Drp1 in ready-to-use buffers and antigenic blocking protein/peptide for immunodepletion assays of Drp1-101AP antibody. FabGennix Int. Inc., has a wide range of antibodies and reagents for biomedical research community, for a complete listing please visit www.FabGenix.Com.

Catalog #	Host Species	Nature	Cross reactivity	Quantity	Vol
Drp1-101AP	Rabbit	Affinity purified Drp1 antibodies	R, M, H, fruitfly	100 ug	200ul
FITC-Drp1	Rabbit	FITC-conjugated Drp1 antibody	R, M, H, fruitfly	100ug	200ul
P-Drp1	n/a	Antigenic blocking peptide for Drp1-101AP	n/a	250ug	100ul
PC-Drp1	n/a	Western blot positive control for Drp1	5 applications	inquire	150ul

R = rat; M = mouse; H = human; C = chicken; monk = monkey; * not all variants are labeled equally

- Immunogen:** Synthetic peptide corresponding to amino acids 455-467 of human Drp1 protein corresponding amino acids (rfp klh dai vev vtc llr krl p), the peptide was amidated and conjugated to a carrier protein for preparation of antigen to generate antibodies in rabbit.
- Concentration:** Drp-101AP Ig concentration 0.55-0.68 mg/ml in antibody stabilization buffer containing preservatives and stabilizing proteins.
- Applications:** Antibody Drl1-101AP is ideal for WB applications for detection of endogenous Drp1 protein in PC-Drp1 sample. The dilutions for this antibody is for reference only, investigators are expected to determine the optimal conditions. Laboratory. Western blotting: > 1:450; IMM: Immunoprecipitation: n.d; IHC = nd. Investigators who want to use this antibody in applications other than listed here can request for a complimentary sample of Drl1-101AP antibodies. We will be happy to provide this antibody form multiple rabbits.
- Reactivity:** The Drp1-101AP antibody detects Drp1 in PC-Drp1 a89-90kDa. The antibody also labels a lower MW protein (33kDa) in brain probably represents either an uncharacterized variant of Drp1 or an unknown protein cross reacts to this antibody. Further experiments are needed to address these possibilities.
- Protocols:** Standard protocol for various applications (WB; IMM and IHC) of this antibody is provided with the product specification sheet, however, FabGennix Inc. strongly recommends investigators to optimize conditions for use of this antibody in their laboratories.
- Notes:** Briefly centrifuge to collect liquid before opening the vial, heat the PC-Drp1 tube in 90oC water bath for 1-2 minutes to dissolve any precipitate before use. This product is "ready-to-use" for electrophoresis. After thawing store at room temperature. Repeated freezing and thawing may result in appearance of higher molecular weight immunoreactive bands. Now you can recycle your western blots (nitrocellulose, supported membranes and PVDF membranes) by using our StripOBuffer (Cat FGI-1989). Each stripping is guaranteed to give better signal (up to 8 stripping). No strong pungent smell of reducing agents or heating is required.
- Form/Storage:** The antiserum is supplied in antibody stabilization buffer with 0.02% sodium azide as preservatives. The affinity-purified antibodies are purified on antigen-sepharose affinity column and supplied as stabilized antibody. For long-term storage of antibodies, store at -20°C. FabGennix Inc. does not recommend storage of very dilute antibody solutions unless they are prepared in specially formulated multi use antibody dilution buffer (Cat # DiluOBuffer). Working solutions of antibodies in DiluOBuffer should be filtered through 0.45 filter after every use for long-term storage.
- References:**

- Cereghetti GM, et al. Dephosphorylation by calcineurin regulates translocation of Drp1 to mitochondria. Proc Natl Acad Sci U S A. 2008 Oct 14;105(41):15803-8. Epub 2008 Oct 6.
- Han XJ, et al., CaM kinase I alpha-induced phosphorylation of Drp1 regulates mitochondrial morphology. J Cell Biol. 2008 Aug 11;182(3):573-85.
- Baloyannis SJ, J Alzheimer Dis. 9, 119, 2006.
- Cho DH, Nakamura T, Fang J, Cieplak P, Godzik A, Gu Z and Lipton SA. S-Nitrosylation of Drp1 mediates beta amyloid-related mitochondrial fission and neuronal injury. Science 324, 102-105, 2009.

*For users who may require large amounts of Drp1-101AP, please enquire about bulk material discounts.
This Product is for Research Use Only and is NOT intended for use in humans or clinical diagnosis.

A 070609-0020SF100 ge02-rev10.00.0111.04.08

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