Revision 1

Store at -20C

#48799

Mitochondrial Dynamics Antibody Sampler Kit

Cell Signaling TECHNOLOGY®

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For Research Use Only. Not for Use in Diagnostic Procedures.

Product Includes	Product #	Quantity	Mol. Wt	Isotype/Source
Tom20 (D8T4N) Rabbit mAb	42406	20 µl	16 kDa	Rabbit IgG
OPA1 (D6U6N) Rabbit mAb	80471	20 µl	80-100 kDa	Rabbit IgG
Phospho-DRP1 (Ser616) (D9A1) Rabbit mAb	4494	20 µl	78-82 kDa	Rabbit IgG
DRP1 (D8H5) Rabbit mAb	5391	20 µl	78-82 kDa	Rabbit IgG
Phospho-MFF (Ser146) Antibody	49281	20 µl	25, 27 kDa	Rabbit
MFF (E5W4M) XP® Rabbit mAb	84580	20 µl	25, 27, 30, 35 kDa	Rabbit IgG
Mitofusin-1 (D6E2S) Rabbit mAb	14739	20 µl	82 kDa	Rabbit IgG
Mitofusin-2 (D1E9) Rabbit mAb	11925	20 µl	80 kDa	Rabbit IgG
Anti-rabbit IgG, HRP-linked Antibody	7074	100 µl		Goat

Please visit cellsignal.com for individual component applications, species cross-reactivity, dilutions, protocols, and additional product information.

Description

The Mitochondrial Dynamics Antibody Sampler Kit provides an economical means to examine signaling involved in mitochondrial dynamics. The kit contains enough primary antibody to perform two western blot experiments.

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 antibody.

Background

Import of proteins into the mitochondria is regulated by the translocase of the outer mitochondrial membrane (TOM) complex, which facilitates transport through the outer mitochondrial membrane, and a complementary translocase of the inner membrane (TIM) complex, responsible for protein transport to the mitochondrial matrix. The TOM complex consists of the receptors Tom20, Tom22, and Tom70, and the channel-forming protein Tom40 (1). Tom20 is localized in the outer mitochondrial membrane and initially recognizes precursors with a presequence to facilitate protein import across the outer mitochondrial membrane (2).

Changes in mitochondrial dynamics regulated by environmental cues affect mitochondrial size and shape and have been shown to dramatically impact mitochondrial metabolism, apoptosis, and autophagy (3). These processes are largely controlled by mitochondrial dynamin-related GTPases, including mitofusin-1, mitofusin-2, OPA1, and DRP1. DRP1 regulates mitochondrial fission, while the mitofusins and OPA1 control fusion at the outer and inner mitochondrial membrane, respectively. These proteins are tightly regulated. OPA1 activity is regulated through alternative splicing and post-translational modifications, including complex proteolytic processing by multiple proteases (4-9). In addition, OPA1 expression can be induced under conditions of metabolic demand through a pathway involving Parkin induced NF-κB activation (10). DRP1 is regulated in part through multiple phosphorylation sites (11). Phosphorylation of DRP1 at Ser616 by MAPK or during mitosis by CDKs stimulates mitochondrial fission (12-14). In contrast, PKA dependent phosphorylation of DRP1 at Ser637 inhibits its GTPase activity and mitochondrial fission (15,16). Mitochondrial fission factor (MFF) is a tail-anchored protein that resides within the outer mitochondrial membrane and is part of the mitochondrial fission complex. MFF participates in mitochondrial fission by serving as one of multiple receptors for the GTPase dynamin-related protein 1 (Drp1) (17-20). AMPK directly phosphorylates MFF at two sites to allow for enhanced recruitment of Drp1 to the mitochondria (21).

Background References

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