

Store at
-20°C

#53898

ER Homeostasis 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 |
|---|-----------|----------|--------------------------|----------------|
| FAM134B (E8Y9R) Rabbit mAb | 83414 | 20 µL | 70 kDa | Rabbit IgG |
| CCPG1 (E3C5G) Rabbit mAb | 80158 | 20 µL | 105-120 kDa | Rabbit IgG |
| XBP-1s (E9V3E) Rabbit mAb | 40435 | 20 µL | 60 kDa (H), 55 kDa (M,R) | Rabbit IgG |
| ATF-6 (D4Z8V) Rabbit mAb | 65880 | 20 µL | 90-100 kDa | Rabbit IgG |
| Phospho-eIF2α (Ser51) (D9G8) XP® Rabbit mAb | 3398 | 20 µL | 38 kDa | Rabbit IgG |
| PERK (C33E10) Rabbit mAb | 3192 | 20 µL | 140 kDa | Rabbit IgG |
| ATF-4 (D4B8) Rabbit mAb | 11815 | 20 µL | 49 kDa | Rabbit IgG |
| IRE1α (14C10) Rabbit mAb | 3294 | 20 µL | 130 kDa | Rabbit IgG |
| BiP (C50B12) Rabbit mAb | 3177 | 20 µL | 78 kDa | Rabbit IgG |
| Anti-rabbit IgG, HRP-linked Antibody | 7074 | 100 µL | | Goat |

See www.cellsignal.com for individual component applications, species cross-reactivity, dilutions, and additional application protocols.

Description: The ER Homeostasis Antibody Sampler Kit provides an economical means of detecting proteins involved in ER homeostasis by regulating ER stress and ER-phagy. The kit includes enough antibodies to perform two western blot experiments with each primary antibody.

Background: The endoplasmic reticulum (ER) is a large organelle extending from the nuclear envelope to the plasma membrane with diversity in structure and function (1,2). It functions in calcium storage, lipid and steroid synthesis, and protein folding, processing, and transport. ER structure and function is regulated in a dynamic fashion adapting to situations of ER stress and organelle damage (1,2). When demands on protein processing exceeds capabilities, cells trigger an adaptive mechanism called the unfolded protein response (UPR) which is largely controlled by the activities of three pathways: PERK, IRE1α, and ATF-6 (1). The ER chaperone protein BiP is recruited to unfolded proteins in the ER lumen and its dissociation from PERK, IRE1α, and ATF-6 leads to their activation. PERK is a kinase on the ER membrane that couples ER stress to changes in translation. PERK activation during ER stress leads to phosphorylation of eIF2α, repressing most translation but selectively inducing some targets such as ATF-4, a transcription factor that regulates targets in the recovery of the stress response. IRE1α is an ER protein with endoribonuclease activity that is activated during ER stress and converts XBP-1 from an unspliced XBP-1μ isoform to a spliced XBP-1s isoform functioning as a transcription factor regulating stress response genes. Lastly, during ER stress, ATF-6 is cleaved liberating a mature transcription factor controlling stress response genes.

Subsequent to ER expansion triggered by the UPR, cells may trigger a process of ER-phagy, the degradation of ER fragments through autophagy (3). Autophagy is a process for the bulk

degradation of cytoplasmic components by a double membrane autophagosome fusing to the lysosome. Selective autophagy, like ER-phagy, permits the degradation of specific targets. This process generally involves specific cargo receptors containing LIR or GIM domains targeting bound cargo to the autophagosome through interactions with LC3 or GABARAP, respectively. FAM134B was the first ER-phagy receptor discovered. Loss of FAM134B can sensitize cells to apoptosis when challenged by nutrient deprivation or ER stress stimuli. CCPG1 is another ER-phagy cargo receptor that associates with FIP200, a component of the ULK1 complex facilitating ER trafficking to autophagosomes. Importantly, CCPG1 is transcriptionally regulated by ER stress. Taken together, signaling from the UPR and ER-phagy help regulate ER homeostasis. Defects in this process may contribute to pathological conditions, including metabolic and neurological disorders, cancer, and defense against infectious diseases (3).

Specificity: Each antibody in the ER Homeostasis Antibody Sampler Kit detects endogenous levels of its target protein. XBP-1s (E9V3E) Rabbit mAb detects bands at 78 kDa and 99 kDa of unknown identity.

Source/Purification: Monoclonal antibodies are produced by immunizing animals with synthetic peptides corresponding to residues surrounding Pro327 of human FAM134B protein, Ala361 of mouse XBP-1s protein, Ala246 of human PERK protein, His963 of human IRE1α protein, Gly584 of human BiP protein, residues near the carboxy terminus of human ATF-6 and ATF-4 protein, and a synthetic phosphopeptide corresponding to residues surrounding Ser51 of human eIF2α 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 for validation data and a complete listing of recommended companion products.

Background References:

- (1) Sano, R. and Reed, J.C. (2013) *Biochim Biophys Acta* 1833, 3460-3470.
- (2) Ferro-Novick, S. et al. (2021) *Trends Biochem Sci* 46, 630-639.
- (3) Hübner, C.A. and Dikic, I. (2020) *Cell Death Differ* 27, 833-842.

U.S. Patent No. 7,429,487, foreign equivalents, and child patents deriving therefrom.

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