Revision 1

Store at -20C

#8645

# Ubiquitin Activation (E1, E2 Enzymes) 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 |
|---|---|---|---|---|
| Ubiquitin Antibody | 3933 | 40 µl | | Rabbit |
| UBE1a Antibody | 4890 | 40 µl | 117 kDa | Rabbit |
| UBC3 Antibody | 4997 | 40 µl | 32 kDa | Rabbit |
| UbcH5C (D60E2) Rabbit mAb | 4330 | 40 µl | 14 kDa | Rabbit IgG |
| UBE2L3 (D5G1) Rabbit mAb | 8721 | 40 µl | 18 kDa | Rabbit IgG |
| UBE2N/Ubc13 (D2A1) Rabbit mAb | 6999 | 40 µl | 17 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 Ubiquitin Activation (E1, E2 Enzymes) Antibody Sampler Kit provides an economical means to study ubiquitin activation and conjugation. This kit contains enough primary antibody to perform four western blots per primary.

## 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

Ubiquitin is a conserved polypeptide unit that plays an important role in the ubiquitin-proteasome pathway. Ubiquitin can be covalently linked to many cellular proteins for degradation by the 26S proteasome. Three components are involved in the target protein-ubiquitin conjugation process. Ubiquitin is first activated by forming a thioester complex with the ubiquitin-activating enzyme (UBE1 or E1). The activated ubiquitin is subsequently transferred to the ubiqutin-carrier protein (conjugating enzyme) E2, and then from E2 to ubiqutin ligase E3 for final delivery to the epsilon-$NH_2$ of the target protein lysine residue (1-3). The ubiquitin-proteasome pathway has been implicated in a wide range of normal biological processes and in disease-related abnormalities. Several proteins such as IκB, p53, cdc25a, and Bcl-2 have been shown to be targets for the ubiquitin-proteasome process as part of the regulation of cell cycle progression, differentiation, cell stress response, and apoptosis (4-7). UBC3, the mammalian ortholog of yeast cdc34, and UBC3B, a UBC3 family member, are E2 ubiquitin-carrier proteins. UBC3, in concert with SCF-Skp2 (Skp1, Cullin, F-box protein/Skp2) complex, mediates cell cycle progression from G1 to S phase by targeting the CDK inhibitor p27 for proteolysis (8). UBC3B, in concert with SCFb-Trcp (Skp1, Cullin and F-box protein/b-Trcp) complex, mediates degradation of β-catenin (9). UbcH5C is a universally expressed E2 ubiquitin conjugating enzyme and member of the UbcH5 family that also includes UbcH5A and UbcH5B (10). Evidence suggests that UbcH5 plays an important role in regulating a number of signaling pathways by catalyzing the ubiquitination of key target proteins, including p53, PCNA, the IκB kinase proein NEMO, and the apoptosis inhibitor BRUCE (11-14). UBE2L3, also commonly referred to as UBCH7, is a ubiquitin-conjugating enzyme that has been linked to the ubiquitination of numerous substrates via its interaction with protein-ubiquitin E3 ligases, such as NEDD4 (15), E6AP (16), Parkin (17), c-Cbl (18), and Triad1 (19,20). UBE2N/Ubc13 is a ubiquitin-E2-conjugating enzyme that catalyzes K63-linked polyubiquitin chain formation (21,22). UBE2N forms a heterodimer with MMS2 or Uev1A to exert its E2 ligase function. The UBE2N/MMS2 and UBE2N/Uev1A heterodimers catalyze different modes of target protein ubiquitination to mediate various signaling pathways (23-25) including DNA damage and recombination, p53 and check point control, cell cycle (26-30), immunoreceptor signaling (31,32), and endocytosis (33).

## Background References

1. Ciechanover, A. (1998) *EMBO J* 17, 7151-60.
2. Hochstrasser, M. (2000) *Nat Cell Biol* 2, E153-7.
3. Hochstrasser, M. (2000) *Science* 289, 563-4.
4. Bernardi, R. et al. (2000) *Oncogene* 19, 2447-54.
5. Aberle, H. et al. (1997) *EMBO J* 16, 3797-804.
6. Salomoni, P. and Pandolfi, P.P. (2002) *Nat Cell Biol* 4, E152-3.
7. Jesenberger, V. and Jentsch, S. (2002) *Nat Rev Mol Cell Biol* 3, 112-21.
8. Pagano, M. et al. (1995) *Science* 269, 682-5.
9. Semplici, F. et al. (2002) *Oncogene* 21, 3978-87.

10. Jensen, J.P. et al. (1995) *J Biol Chem* 270, 30408-14.
11. Saville, M.K. et al. (2004) *J Biol Chem* 279, 42169-81.
12. Zhang, S. et al. (2008) *Cell Cycle* 7, 3399-404.
13. Tang, E.D. et al. (2003) *J Biol Chem* 278, 37297-305.
14. Qiu, X.B. et al. (2004) *EMBO J* 23, 800-10.
15. Anan, T. et al. (1998) *Genes Cells* 3, 751-63.
16. Huang, L. et al. (1999) *Science* 286, 1321-6.
17. Shimura, H. et al. (2001) *Science* 293, 263-9.
18. Yokouchi, M. et al. (1999) *J Biol Chem* 274, 31707-12.
19. Marteijn, J.A. et al. (2009) *Leukemia* 23, 1480-9.
20. Marteijn, J.A. et al. (2005) *Blood* 106, 4114-23.
21. Herrmann, J. et al. (2007) *Circ Res* 100, 1276-91.
22. Wilkinson, K.D. et al. (2005) *EMBO Rep* 6, 815-20.
23. Hofmann, R.M. and Pickart, C.M. (1999) *Cell* 96, 645-53.
24. Deng, L. et al. (2000) *Cell* 103, 351-61.
25. Andersen, P.L. et al. (2005) *J Cell Biol* 170, 745-55.
26. Zhao, G.Y. et al. (2007) *Mol Cell* 25, 663-75.
27. Kolas, N.K. et al. (2007) *Science* 318, 1637-40.
28. Laine, A. et al. (2006) *Mol Cell Biol* 26, 8901-13.
29. Huen, M.S. et al. (2008) *Mol Cell Biol* 28, 6104-12.
30. Loring, G.L. et al. (2008) *Cell Cycle* 7, 96-105.
31. Yamamoto, M. et al. (2006) *Nat Immunol* 7, 962-70.
32. Yamamoto, M. et al. (2006) *J Immunol* 177, 7520-4.
33. Duncan, L.M. et al. (2006) *EMBO J* 25, 1635-45.

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