

**Orders:** 877-616-CELL (2355)  
orders@cellsignal.com

**Support:** 877-678-TECH (8324)

**Web:** info@cellsignal.com  
cellsignal.com

3 Trask Lane | Danvers | Massachusetts | 01923 | USA

**#8645** Store at -20C

## Ubiquitin Activation (E1, E2 Enzymes) Antibody Sampler Kit

**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](http://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 ubiquitin-carrier protein (conjugating enzyme) E2, and then from E2 to ubiquitin ligase E3 for final delivery to the epsilon-NH<sub>2</sub> 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 protein 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 checkpoint 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. Martejijn, J.A. et al. (2009) *Leukemia* 23, 1480-9.
  20. Martejijn, 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.
- 

## Trademarks and Patents

Cell Signaling Technology is a trademark of Cell Signaling Technology, Inc.

All other trademarks are the property of their respective owners. Visit [cellsignal.com/trademarks](http://cellsignal.com/trademarks) for more information.

## Limited Uses

Except as otherwise expressly agreed in a writing signed by a legally authorized representative of CST, the following terms apply to Products provided by CST, its affiliates or its distributors. Any Customer's terms and conditions that are in addition to, or different from, those contained herein, unless separately accepted in writing by a legally authorized representative of CST, are rejected and are of no force or effect.

Products are labeled with For Research Use Only or a similar labeling statement and have not been approved, cleared, or licensed by the FDA or other regulatory foreign or domestic entity, for any purpose. Customer shall not use any Product for any diagnostic or therapeutic purpose, or otherwise in any manner that conflicts with its labeling statement. Products sold or licensed by CST are provided for Customer as the end-user and solely for research and development uses. Any use of Product for diagnostic, prophylactic or therapeutic purposes, or any purchase of Product for resale (alone or as a component) or other commercial purpose, requires a separate license from CST. Customer shall (a) not sell, license, loan, donate or otherwise transfer or make available any Product to any third party, whether alone or in combination with other materials, or use the Products to manufacture any commercial products, (b) not copy, modify, reverse engineer, decompile, disassemble or otherwise attempt to discover the underlying structure or technology of the Products, or use the Products for the purpose of developing any products or services that would compete with CST products or services, (c) not alter or remove from the Products any trademarks, trade names, logos, patent or copyright notices or markings, (d) use the Products solely in accordance with CST Product Terms of Sale and any applicable documentation, and (e) comply with any license, terms of service or similar agreement with respect to any third party products or services used by Customer in connection with the Products.