

Store at -20°C  
#9839

## AMPK Subunit Antibody Sampler Kit

1 Kit (7 x 20 microliters)



**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 |
|--------------------------------------|-----------|-------------|---------|----------------|
| AMPK $\alpha$ 1 Antibody             | 2795      | 20 $\mu$ l  | 62 kDa  | Rabbit         |
| AMPK $\alpha$ 2 Antibody             | 2757      | 20 $\mu$ l  | 62 kDa  | Rabbit         |
| AMPK $\beta$ 1 (71C10) Rabbit mAb    | 4178      | 20 $\mu$ l  | 38 kDa  | Rabbit IgG     |
| AMPK $\beta$ 2 Antibody              | 4148      | 20 $\mu$ l  | 30 kDa  | Rabbit         |
| AMPK $\gamma$ 1 Antibody             | 4187      | 20 $\mu$ l  | 37 kDa  | Rabbit         |
| AMPK $\gamma$ 2 Antibody             | 2536      | 20 $\mu$ l  | 75 kDa  | Rabbit         |
| AMPK $\gamma$ 3 Antibody             | 2550      | 20 $\mu$ l  | 54 kDa  | Rabbit         |
| Anti-rabbit IgG, HRP-linked Antibody | 7074      | 100 $\mu$ l |         | Goat           |

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### Description

The AMPK Subunit Antibody Sampler Kit provides an economical means to investigate the role played by all AMPK subunits in cellular energy homeostasis. The kit contains enough primary and secondary antibodies to perform two Western blots with each antibody.

### Storage

Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100  $\mu$ g/ml BSA, 50% glycerol and less than 0.02% sodium azide. Store at -20°C. Do not aliquot the antibody.

### Background

AMP-activated protein kinase (AMPK) is highly conserved from yeast to plants and animals and plays a key role in the regulation of energy homeostasis (1). AMPK is a heterotrimeric complex composed of a catalytic  $\alpha$  subunit and regulatory  $\beta$  and  $\gamma$  subunits, each of which is encoded by two or three distinct genes ( $\alpha$ 1, 2;  $\beta$ 1, 2;  $\gamma$ 1, 2, 3) (2). The kinase is activated by an elevated AMP/ATP ratio due to cellular and environmental stress, such as heat shock, hypoxia, and ischemia (1). The tumor suppressor LKB1, in association with accessory proteins STRAD and MO25, phosphorylates AMPK $\alpha$  at Thr172 in the activation loop, and this phosphorylation is required for AMPK activation (3-5). AMPK $\alpha$  is also phosphorylated at Thr258 and Ser485 (for  $\alpha$ 1; Ser491 for  $\alpha$ 2). The upstream kinase and the biological significance of these phosphorylation events have yet to be elucidated (6). The  $\beta$ 1 subunit is post-translationally modified by myristoylation and multi-site phosphorylation including Ser24/25, Ser96, Ser101, Ser108, and Ser182 (6,7). Phosphorylation at Ser108 of the  $\beta$ 1 subunit seems to be required for AMPK activation, while phosphorylation at Ser24/25 and Ser182 affects AMPK localization (7). Several mutations in AMPK $\gamma$  subunits have been identified, most of which are located in the putative AMP/ATP binding sites (CBS or Bateman domains). Mutations at these sites lead to reduction of AMPK activity and cause glycogen accumulation in heart or skeletal muscle (1,2). Accumulating evidence indicates that AMPK not only regulates the metabolism of fatty acids and glycogen, but also modulates protein synthesis and cell growth through EF2 and TSC2/mTOR pathways, as well as blood flow via eNOS/nNOS (1).

### Background References

1. Hardie, D.G. (2004) *J Cell Sci* 117, 5479-87.
2. Carling, D. (2004) *Trends Biochem Sci* 29, 18-24.
3. Hawley, S.A. et al. (1996) *J Biol Chem* 271, 27879-87.
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5. Shaw, R.J. et al. (2004) *Proc Natl Acad Sci USA* 101, 3329-35.
6. Woods, A. et al. (2003) *J Biol Chem* 278, 28434-42.
7. Warden, S.M. et al. (2001) *Biochem J* 354, 275-83.

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