

PRODUCT INFORMATION



AMPK Complex (α 1, β 1, and γ 1 subunits; human, recombinant)

Item No. 32557

Overview and Properties

Synonyms: AMPK Subunit α -1: MGC33776, MGC57364, PRKAA1; AMPK Subunit β -1: HAMPKb, MGC17785, PRKAB1; AMPK Subunit γ 1: AMPKG, MGC8666, PRKAG1

Source: Active recombinant human C-terminal His-tagged AMPK complex (α 1, β 1, and γ 1 subunits) expressed in insect cells

Amino Acids: α 1: 1-559; β 1: 1-270; γ 1: 1-331

Uniprot Nos.: α 1: Q13131; β 1: Q9Y478; γ 1: P54619

Molecular Weight: ~146 kDa complex (α 1: 65 kDa; β 1: 38 kDa; γ 1: 31 kDa)

Storage: -80°C (as supplied)

Stability: \geq 6 months

Purity: \geq 90% estimated by SDS-PAGE

Supplied in: 50 mM Sodium phosphate, pH 7.0, with 300 mM sodium chloride, 150 mM imidazole, 0.25 mM DTT, and 25% glycerol

Protein

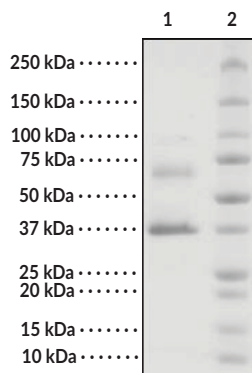
Concentration: *batch specific* mg/ml

Activity: Assay performed in Tris-buffered solution containing Mg^{2+} with 1 mM DTT using AMARA peptide as a substrate (0.1 mg/ml), 20 μ M ATP and 100 μ M AMP. Reaction was done at 30°C for 45 min. Amount of ATP transferred was calculated using *via* luminescent assay.

Specific Activity: *batch specific* U/mg

Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

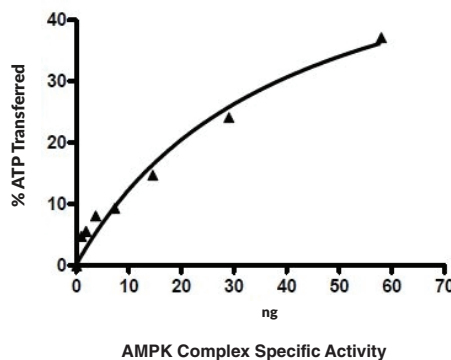
Images



Lane 1: AMPK Complex
Lane 2: MW Markers

SDS-PAGE Analysis of AMPK Complex.

Representative gel image shown; actual purity may vary between each batch.



WARNING
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

WARRANTY AND LIMITATION OF REMEDY
Buyer agrees to purchase the material subject to Cayman's Terms and Conditions. Complete Terms and Conditions including Warranty and Limitation of Liability information can be found on our website.

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Description

AMP-activated protein kinase (AMPK) is a heterotrimeric serine/threonine kinase.¹ It is composed of an α subunit, two β subunits, and two γ subunits. The α and β subunits each have two isoforms, designated as $\alpha 1$, $\alpha 2$, $\beta 1$, and $\beta 2$, which differ at residues affected by post-translational modifications, and the γ subunit has $\gamma 1$, $\gamma 2$, and $\gamma 3$ isoforms. The diversity of isoforms that can comprise the AMPK complex impart differing functions and subcellular localization.^{1,2} AMPK is ubiquitously expressed in eukaryotes, and AMPK complexes containing an $\alpha 1$ subunit are localized to the cytoplasm.² AMPK is activated by phosphorylation of the α subunit by kinases and/or by AMP or ADP binding to the γ subunit, which occurs under low energy conditions with high ratios of AMP/ADP to ATP, or an increase in intracellular calcium levels.^{1,3} In this way, AMPK acts as a regulator of cellular energy homeostasis. It can also be activated under conditions of oxidative stress, where it functions as a redox sensor.² Its activity is decreased under high energy conditions where ATP, glucose, fatty acids, and amino acids are plentiful.¹ AMPK is involved via its downstream signaling pathways in lipid and glucose metabolism, protein synthesis, autophagy, and redox regulation, as well as inhibition of inflammatory processes.^{1,3} AMPK activation *in vivo* reduces adiposity in mice, as well as inhibits proliferation of cancer cells *in vitro* and reduces tumor growth in mouse xenograft models.² Cayman's AMPK $\alpha 1$, $\beta 1$, and $\gamma 1$ Subunits (human, recombinant) protein can be used for enzyme activity assay applications. This protein consists of 1,160 amino acids and has a calculated molecular mass of approximately 146 kDa.

References

1. Jeon, S.-M. Regulation and function of AMPK in physiology and diseases. *Exp. Mol. Med.* **48(7)**, e245 (2016).
2. Shirwany, N.A. and Zou, M.-H. AMPK: A cellular metabolic and redox sensor. A minireview. *Front. Biosci. (Landmark Ed.)* **19**, 447-474 (2014).
3. Hardie, D.G., Ross, F.A., and Hawley, S.A. AMPK: A nutrient and energy sensor that maintains energy homeostasis. *Nat. Rev. Mol. Cell Biol.* **13(4)**, 251-262 (2012).

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