AMPK

5' AMP-activated protein kinase or AMPK or 5' adenosine monophosphate-activated protein kinase is an enzyme (EC 2.7.11.31) that plays a role in cellular energy homeostasis. It consists of three proteins (subunits) that together make a functional enzyme, conserved from yeast to humans. It is expressed in a number of tissues, including the liver, brain, and skeletal muscle. The net effect of AMPK activation is stimulation of hepatic fatty acid oxidation, ketogenesis, stimulation of skeletal muscle fatty acid oxidation and glucose uptake, inhibition of cholesterol synthesis, lipogenesis, and triglyceride synthesis, inhibition of adipocyte lipolysis and lipogenesis, and modulation of insulin secretion by pancreatic beta-cells.

It should not be confused with cyclic AMP-activated protein kinase (protein kinase A).

AMP-activated protein kinase (AMPK) is a metabolic regulator that acts to limit the growth of cancer cells. AMPK is downregulated by melanoma associated antigen A3/6 (MAGEA3/6), which are cancer-specific proteins that enhance the activity of specific E3 ubiquitin ligases to ubiquitinate and degrade AMP-activated protein kinase $\alpha 1$ (AMPK $\alpha 1$). Here, using a bioinformatic approach, we identified a microRNA, miR-1273 g-3p, that is predicted to target the 3' untranslated region (UTR) of MAGEA3/6. Analyzing miR-1273 g-3p expression in human colon cancer tissues, we found a reduction in miR-1273 g-3p expression correlating with increased MAGEA3/6 expression and AMPK $\alpha 1$ downregulation. Expression of miR-1273 g in HT-29 cells and primary human colon cancer cells downregulated MAGEA3/6, leading to AMPK $\alpha 1$ upregulation, inhibition of proliferation and cell apoptosis. The anti-CRC activity of miR-1273 g-induced actions in HT-29 cells. In vivo, miR-1273 g- or MAGEA3/6 shRNA-expressing HT-29 tumors grew significantly slower than control tumors. We propose a novel MicroRNA-based mechanism, whereby miR-1273 g represses MAGEA3/6 expression in human CRC cells and tissues, which may provide a novel cancer-specific therapeutic ¹.

1)

Wu F, Liu F, Dong L, Yang H, He X, Li L, Zhao L, Jin S, Li G. miR-1273g silences MAGEA3/6 to inhibit human colorectal cancer cell growth via activation of AMPK signaling. Cancer Lett. 2018 Jul 26. pii: S0304-3835(18)30495-6. doi: 10.1016/j.canlet.2018.07.031. [Epub ahead of print] PubMed PMID: 30056111.

From: https://neurosurgerywiki.com/wiki/ - **Neurosurgery Wiki**

Permanent link: https://neurosurgerywiki.com/wiki/doku.php?id=ampk

Last update: 2024/06/07 02:56

