

AMP-Activated Protein Kinase: Structure, Function, and Role in Pathological Processes

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Abstract—Recently, AMP-activated protein kinase (AMPK) has emerged as a key regulator of energy balance at cellular and whole-body levels. Due to the involvement in multiple signaling pathways, AMPK efficiently controls ATP-consuming/ATP-generating processes to maintain energy homeostasis under stress conditions. Loss of the kinase activity or attenuation of its expression leads to a variety of metabolic disorders and increases cancer risk. In this review, we discuss recent findings on the structure of AMPK, its activation mechanisms, as well as the consequences of its targets in regulation of metabolism. Particular attention is given to low-molecular-weight compounds that activate or inhibit AMPK; the perspective of therapeutic use of such modulators in treatment of several common diseases is discussed.

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