New compounds that modulate the enzymatic complex AMPK for the treatment of metabolic, inflammatory, cardiovascular, neurodegenerative diseases and cancer

CSIC, CIBER and University of Barcelona have found a family of heterocyclic compounds which act as activators of protein kinase AMPK. This enzyme regulates the energy status of the cell. Therefore, these compounds are useful for the treatment of cancer, metabolic and cardiovascular diseases, among others.

Pharmaceutical companies interested in a patent licence are sought.

Compounds that regulate cellular energy metabolism

Serine/Threonine protein kinase activated by adenosine monophosphate (AMPK) is an enzyme involved in energy production processes such as glycolysis, lipid oxidation and gluconeogenesis. Therefore, AMPK is currently considered as a promising therapeutic target for the treatment of metabolic diseases such as type 2 diabetes and obesity.

Since AMPK is also present in the heart, its activation leads to a decrease in cardiac hypertrophy and heart failure risk.

Furthermore, derivatives of this invention have been successfully tested and are able to activate AMPK through assays on mammalian Hek293 cells with values similar to those obtained from Phenformin, a well-known activator of AMPK, but at lower doses.

Therefore, these compounds are especially useful for the treatment of diseases where the function of AMPK is relevant as for example, cancer, metabolic and cardiovascular diseases.

Main advantages and applications

- The compounds are able to induce in vivo activation of AMPK enzymatic complex.
- As described in the literature, activation of AMPK has anti-diabetogenic and cardiovascular protecting effects.
- It has also been described that direct activation of AMPK inhibits prostate cancer growth in vitro and in vivo. Persistent activation of AMPK results in mitotic arrest and apoptosis of prostate cancer cells. It has been suggested that this effect is due to inhibition of lipogenesis.

Patent Status
Priority patent application filed

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