

Modulating compounds of KChIP2 and its use for the treatment of cardiovascular pathologies

CSIC and UAM have developed compounds that positively modulate protein-protein interactions that involve KChIP2 protein.

Industrial partners from the pharmaceutical industry are being sought to collaborate through a patent licence agreement

An offer for Patent Licensing

Modulation of I_{to} in different cardiac pathologies

KChIP2 is a neuronal calcium sensor that regulates voltage-dependent potassium channels, mainly those belonging to the K_v4 family, thus generating the outward potassium current (I_{to}). This current is essential to control cardiac excitability and is reduced in cardiac pathologies.

Various heart diseases, such as cardiac hypertrophy, present a decreased I_{to} . Moreover, it has been described that mice lacking KChIP2 are more susceptible to generate ventricular arrhythmias.



Modeling of a potential interaction between the new compounds and KChIP proteins using annealing molecular dynamics analysis.

Main innovations and advantages

- These compounds have the capacity to modulate KChIP2 function and to affect the transient outward K^+ current in cardiomyocytes. They produce a significant increase in the maximum peak current of the outward potassium current of cardiomyocytes without modifying the decay time constant.
- Taking into account that the down-regulation of KChIP2 is associated with the onset of various heart diseases and that the up-regulation of KChIP2 prevents the development of cardiac hypertrophy in animal models, the compounds of the invention, which act as modulators of this protein, are potentially useful in the treatment of heart diseases presenting a decrease in the transient outward K^+ current (cardiac hypertrophy, arrhythmias, infarct and ischemic failure).

Patent Status

Priority patent application filed suitable for international extension

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