Technology Offer CSIC/AH/049

Peptides for the treatment of cardiac diseases

Novel peptide-based compounds for the treatment of cardiovascular diseases, including ventricular arrhythmias in patients with heart failure and hereditary syndromes characterized by reduced function of sodium or potassium ion channels.

Intellectual Property

International PCT filed

Intended Collaboration

Licensing and/or co-development

Stage of development

In vivo efficacy in murine model

Contact

Ana sanz Herrero

Vice-presidency for Innovation and Transfer

Ana.sanz@csic.es
comercializacion@csic.es

Market need

Heart failure (HF) is a syndrome characterized by high morbidity and mortality, with approximately 50% of patients dying within the first five years. Ventricular arrhythmias can trigger ventricular fibrillation and sudden cardiac death. Arrhythmic sudden death accounts for up to 50% of all deaths in patients with HF. Currently, there is no optimal pharmacological treatment for ventricular arrhythmias in these patients, making it necessary to resort to the implantation of a defibrillator or cardiac resynchronization device. These devices have been shown to reduce the incidence of sudden death; however, they are highly expensive and associated with adverse effects that can significantly impair patients' quality of life.

Proposed solution

An 11-amino acid peptide (DECA-11), encoded by cDNA inserted into a viral vector, has been developed for the treatment of cardiac diseases, including ventricular arrhythmias associated with heart failure, cardiac hypertrophy, and hereditary syndromes involving loss-of-function mutations in sodium (Nav1.5) or potassium (Kir2.1) channels..

DECA-11 significantly increases the current density generated by cardiac sodium (INa) and potassium (IK1) channels, and reduces both the incidence and duration of arrhythmias in a murine model of heart failure.

Competitive advantages

- DECA-11, encoded by cDNA in a viral vector, increases current density of sodium and potassium channels in human cardiomyocytes and prevents ventricular arrhythmias in a murine heart failure model
- Additionally, synthetic 12-amino acid peptides have been developed that are capable of cellular internalization and exhibit good serum stability. These peptides also enhance INa and IK1 currents in cell culture models.