Therapies

Antitumor gene therapy with NOS-3

A research group of the Andalusian Public Health System and FISEVI, in collaboration with the University of Seville, has developed a new gene therapy based on the specific overexpression of NOS-3 in tumor cells

Oficina de TRANSFERENCIA DE TECNOLOGÍA
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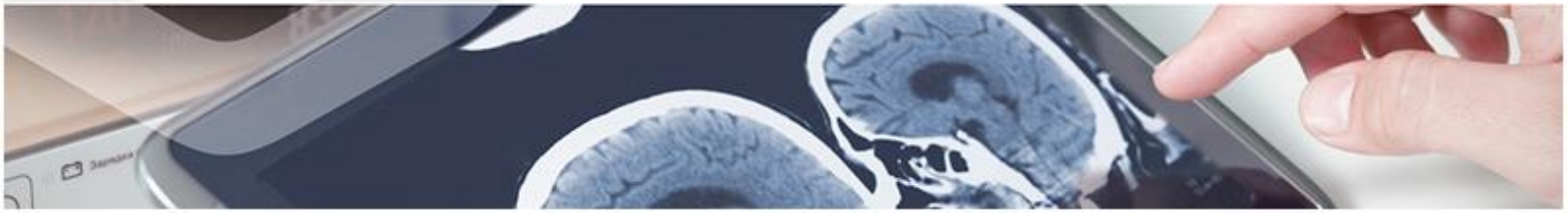

Description

Hepatocellular carcinoma (HCC) is the most common primary malignant tumor of the liver, causing the annual death of 250,000 to one million people worldwide. It is the sixth most common malignancy and the fourth cause of cancer-related mortality.

Curative treatments (ablation, resection and liver transplantation) are indicated in the early stages of the disease. The tumor recurrence-free survival in patients undergoing liver transplantation who meet the Milan criteria is high (80%). However, tumor recurrence-free survival in patients undergoing liver resection is low (40%), even in the absence of vascular invasion. On the other hand, chemo- and radiotherapy, and sorafenib are the recommended treatment in patients with intermediate and advanced stages. However, the 3-year survival of these patients is below 20-40%. The poor prognosis of patients in advanced stage are related to the presence of portal invasion (Stage III, TNM staging) and metastasis (Stage IV, TNM staging). Thus, it is extremely important to identify new treatments for these stages of the disease.

The intratumoral administration of a nitric oxide donor or the over expression of NOS-3 in tumor cells increase the expression of cell death receptors and reduce tumor size derived from subcutanenous implantation of liver cancer cells in a xenograft mouse model.

The specific NOS-3 over-expression in liver cancer cells, by the infusion of adenovirus including NOS-3 overexpressing vector induces cell death of tumor cells developed in a fibrotic hepatic environment. The treatment reduces the side effect of systemic treatment on the vascular bed or stromal cells. The induction of potent oxidative and nitrosative stress in liver cancer cells is related to increased expression of cell death receptors and apoptosis.

Advantages

1- There is no specific gene therapy for the treatment of HCC.
2- Current treatments indicated for patients with HCC are surgical, radiological or pharmacological type, depending on the stage of the patient. The advantage of the proposed therapeutic strategy is its high effectiveness and specificity for liver tumor cells.
3- The recommended actual treatments for patients with HCC do not achieve both characteristics.

Intellectual Property

This technology is covered by a Spanish Patent Application with possibility of international extension.

Aims

We are looking for a partner interested in a license or/and collaboration agreement to further develop and exploit this innovative technology.

Classification

Area: Biotech-Pharma (Therapy)
Technology: Gene therapy
Pathology: Oncology and Hematology

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