Universidad de Navarra

Research Project Proposal
Academic year 2024-2025

Project Nº 31

Title: *Optimizing CAR-T cell therapy for breast cancer using immunomodulatory phytomedicines.*

Department/ Laboratory
Laboratorios de "Terapia celular adoptiva" y "Terapia Génica para Cáncer" del Programa de "Inmunología e Inmunoterapia" y "Terapia Génica", respectivamente. Centro de investigación Médica Aplicada (CIMA).

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Summary

Chimeric Antigen Receptors modified T-cells (CAR-T) is a new therapy which exploits the body's immune system to combat cancer cells. CAR T-cell therapy is revolutionizing cancer treatment, especially hematological tumors. In CAR T-cell therapies, T cells are taken from the patient's blood and are modified by adding a gene for a receptor which helps T cells attach to a specific cancer cell antigen. However, although the CAR T-cell technology has immense potential, an important factor that limits the efficacy of CAR-T cells in solid tumors is the immunosuppressive tumor microenvironment (TME). To overcome this lack of efficacy, some efforts have explored the use of concomitant administration of phytomedicines.
In recent years standardized plant-derived immunomodulatory extracts (SPIE) have shown great potential in cancer immunotherapy due to their multifunctional activity and low toxicity. The P2Et is a standardized extract of *Caesalpinia spinosa* seads which has shown an antitumoral ability. Although P2Et has been shown to be safe in healthy individuals, the biological activity can be increased by improving the dosage form. This remodels the immunosuppressive TME and is currently being tested in combination with immunotherapy or radiotherapy in clinical trials. In collaboration with DreemBio SAS, we propose the combination of P2Et with CAR-T cells to enhance the antitumor efficacy of CAR-T cells in breast cancer. The project will involve the use of many different techniques, including genetic modification of T-cells, virus production, analysis by flow cytometry and immunoassays, cytotoxicity analysis, animal models of cancer, in vivo experiment of CAR-T therapy).

Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator?

yes	√
no	