Diagnostics/ Therapy

Autologous human T cell *in vitro* culture system

A research group of the Andalusian Public Health System, in collaboration with the University of Seville, has developed an autologous cell *in vitro* co-culture system to study the homeostatic proliferation of T-lymphocytes useful in the diagnosis and treatment of patients suffering pathologies that present lymphopenia.

Oficina de TRANSFERENCIA DE TECNOLOGÍA
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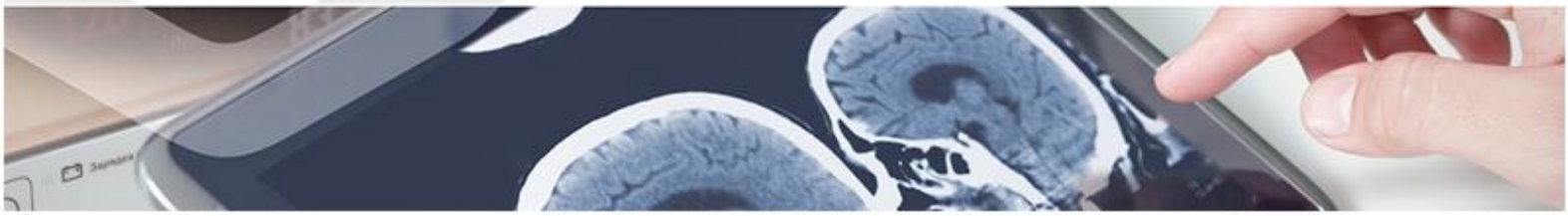

Description

Several mechanisms are involved in reconstituting the pool of naïve T cells. On the one hand, the thymus supports the maturation of hematopoietic precursors to generate new T cells and guarantees the preservation of the TCR variability. On the other hand, the process of homeostatic proliferation (HP) involves a peripheral clonal T cell expansion in response to homeostatic stimuli such as antigens or commensals and cytokines. Although both mechanisms are essential for the reconstitution of naïve T cell pool, HP plays an important role in the early stages of immune reconstitution. Several approaches have been generated for the study of the HP process based on *in vivo* animal models and *in vitro* models. However, these models do not respect the specific antigenic load of each individual and/ or scenario, so they are difficult to extrapolate to the different human lymphogenic states.

Our research group has developed, optimized and characterized an *in vitro* system of culture of autologous human cells that allows studying the various types of homeostatic proliferation in humans respecting the specific antigenic characteristics of each patient. This experimental approach constitutes a tool for the study of peripheral compensatory mechanisms in a more specific way in the different human lymphogenic scenarios, potentially useful for: (i) characterizing and classifying patients with pathologies which present lymphopenia based on the analysis of proliferative capacity of T-lymphocytes in response to homeostatic (autologous) stimuli as well as in the phenotypic characteristics of proliferated cells; (ii) obtaining specific T-regulatory cells (Tregs) generated during HP for the treatment of autoimmune or inflammatory diseases, allergy, asthma, graft versus host disease, or transplant rejection.

Advantanges

1. *In vitro* system that allows obtaining very complete information about the different HP processes in humans without having to use non-human animal models, with limited extrapolation in terms of cellular characteristics.
2. Respects the specific antigenic load of each individual and/ or clinical scenario, allowing extrapolating results to human lymphogenic states.
3. It allows obtaining the cellular fraction enriched in functional Treg cells, by means of the quantification of specific cellular markers, which could be used as cellular therapy in certain clinical scenarios.

Intellectual Property

Protected by an European patent application with the possibility of international extension.

Objectives

Looking for a partner interested in a license and/ or a collaboration agreement to further develop and exploit this technology.

Classification

Área: Diagnostics/ Therapy.
Patología: Autoimmune and Inflammation; Transplant; Infectious diseases.

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