Technology Offer

METHOD FOR PROMOTING HEMATOPOIETIC STEM CELL (HSC) GENERATION, CELL COMPOSITION AND USES THEREOF

Research groups from CIBER, Hospital del Mar Research Institute, Josep Carreras Research Insitute and ICREA have patented a rodent model

The Need

For over five decades, cell therapies have been vital for treating leukemia, hematopoietic syndromes, and genetic immune disorders. However, the success of these therapies depends on finding HLA-compatible donors, leaving 10–20% of patients without viable matches—especially those from minority populations. These patients face limited treatment options and higher risks.

The ability to generate hematopoietic stem cells (HSCs) and blood products on demand would transform current clinical practice, expanding access to transplantation, provide solutions for patients with rare blood group haplotypes and facilitate novel hematopoietic cell therapies, including cellular immunotherapies for cancer. Despite decades of effort, the reproducible production of robust, functional, long-term engrafting HSCs in the laboratory remains an unmet need.

The Solution

The inventors, have identified and patented a set of seven genes (SADEiGEN) that, upon their activation are capable of inducing mouse embryonic stem cells to differentiate into hematopoietic stem and progenitor cells (HSPCs) with long-term hematopoietic potential attributable to Hematopoietic stem cells.

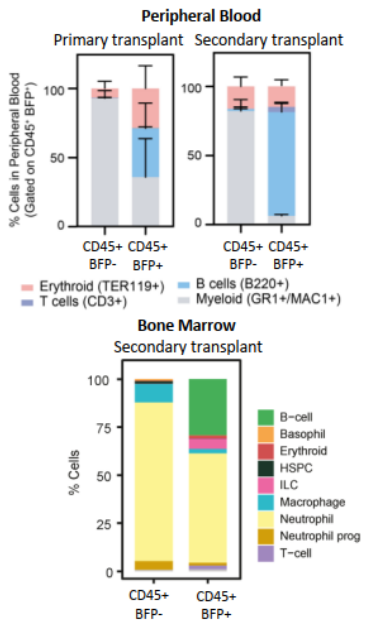
Innovative Aspects

1. SADEiGEN-induced HSPCs have the **potential to self-renew**, as demonstrated by serial transplantation.
2. This protocol is based in a **temporary gene expression strategy**, enabling differentiation without permanent genetic modification, **enhancing clinical safety**.
3. Potential to address major unmet medical needs with a significant social impact by improving treatment accessibility and equity, and economic benefits by reducing costs linked to donor dependency and personalized therapies.

Ongoing studies

The inventors are working to translate these findings into mouse induced pluripotent stem cells and human pluripotent stem cells. This strategy aims to establish a reproducible protocol to generate human HSCs from an unlimited, donor-independent source.

Intellectual Property: Priority european patent application filed (February 07th, 2025)



A. In vivo validation confirms the generation of HSPCs which multilineage engraft from mESCs
B. In vivo SADEiGEN-derived blood displays characteristics of functional maturation.

Aims

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

Contact details

Centro de Investigación Biomédica en Red *(CIBER)*
otc@ciberisciii.es
transferencia@ciberisciii.es
https://www.ciberisciii.es/en