

3D printed hydrogels for immune cell culture

CANCER IMMUNOTHERAPY

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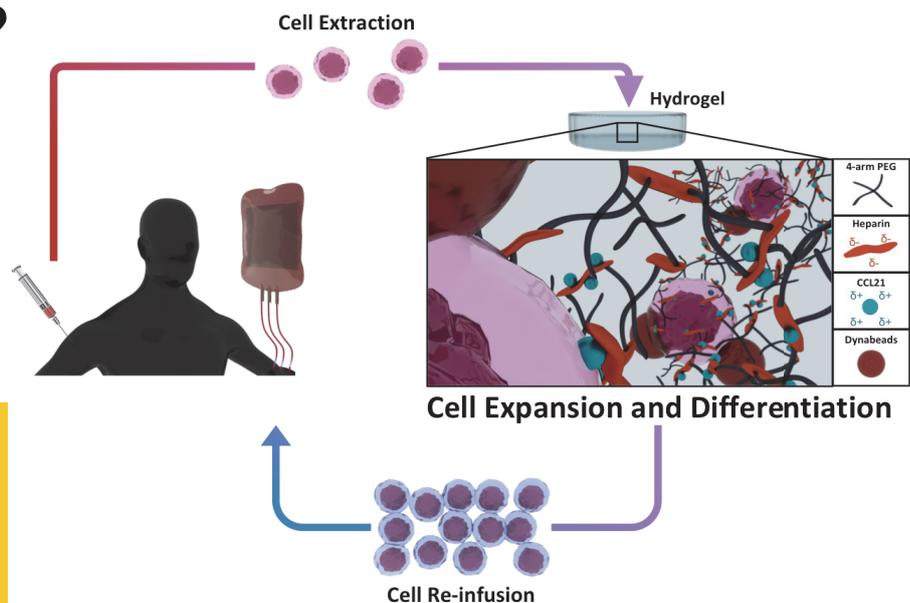
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Hydrogels mimic the lymph nodes improving immune cell proliferation and differentiation

What is Adoptive Cell Therapy?



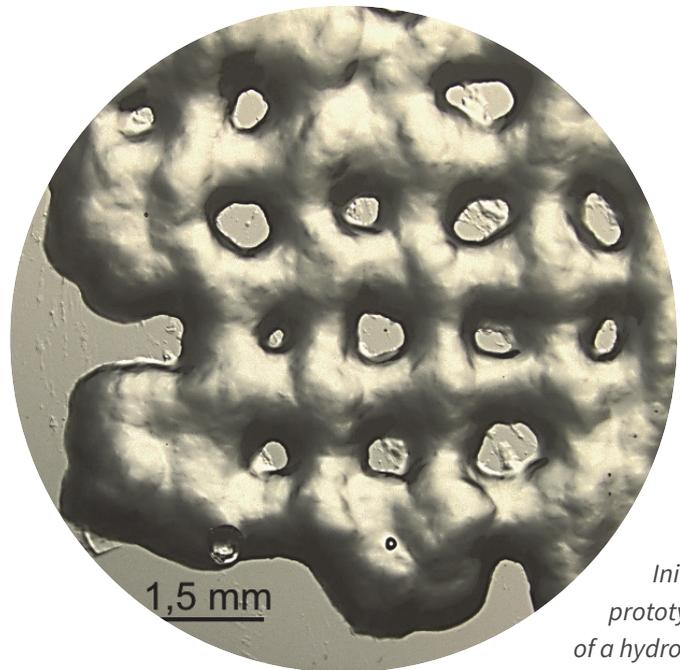
Cancer immunotherapy uses the immune system to detect and eliminate malignant cells selectively. Adoptive cell therapy (ACT) is a personalized immunotherapy that requires in vitro large expansion of immune cells. Current cell expansion methods limit the expansion of ACT.

Simplified diagram showing the process of adoptive cell therapy: extraction of cells, expansion and differentiation, and injection of cells into patients
Biomaterials (259, 120313, 2020)

We have developed a new 3D scaffold that mimics the lymph nodes for the proliferation and differentiation of immune cells, such as T lymphocytes, ready for immunotherapy applications

How can our 3D hydrogels help in Cancer Immunotherapy?

Our PEG-heparin 3D hydrogel scaffold, loadable with immune-relevant molecules, provide higher cell proliferation rates and the capacity to tune cell phenotype by mimicking the lymph nodes.



Initial prototype of a hydrogel scaffold manufactured with a 3D printer / ICMAB-CSIC, IBEC



Advantages of the functionalized PEG hydrogels for 3D cell culture

- ✓ Higher cell proliferation rates
- ✓ Tunable phenotype proportions
- ✓ Different combinations of immune-relevant molecules available to customize cell differentiation

Patent Status

European patent application filed suitable of international extension

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Reference Article

CCL21-loaded hydrogels for T cell expansion and differentiation

Eduardo Pérez del Río, Fabião Santos, Xavier Rodriguez Rodriguez, Marc Martinez Miguel, Ramon Roca Pinilla, Anna Arís, Elena Garcia-Fruitós, Jaume Veciana, Joachim P. Spatz, Imma Ratera, Judith Guasch

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