

SYNTHETIC HYDROGEL AND ITS USE FOR IMMUNOTHERAPY AND 3D-PRINTING

Patient need addressed

Cancer
Autoimmune diseases

The Solution

The present invention discloses a novel 3D (bio)printable hydrogel, the method for producing it and its use in T cell culture for immunotherapies. This hydrogel is based on a functionalized poly(ethylene)glycol (PEG) polymer covalently combined with heparin (Hep), which is loaded with at least one immune molecule.

This innovative technology is able to produce large amounts of specific T cells *ex vivo*, which are needed for immunotherapies, by mimicking the lymph nodes.

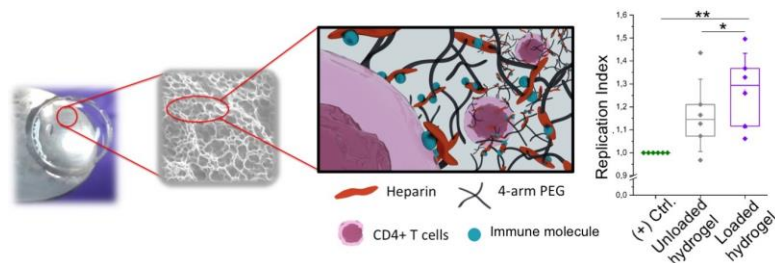
Innovative Aspects

The PEG-Hep hydrogel was combined with different positively charged biomolecules such as cytokines and cell-adhesive molecules to provide customized hydrogel scaffolds.

These scaffolds are able to mimic the extracellular matrix of the lymph nodes, thus showing potential to fabricate artificial lymph nodes for therapy and research models (organ on a chip).

High immune cell proliferation parameters have been obtained, essential to produce the necessary amounts of therapeutic T cells to reach the appropriate clinical doses.

The hydrogel can be used as a bioink for 3D printing, thus finding applications in biotechnology, medicine, and tissue engineering.



Stage of Development: *In vitro* validation ready for *in vivo* studies and clinical proof of concept

Intellectual Property

European patent application (Priority date: May 21, 2020)

International patent application, PCT (May 21, 2021)

Available for
Licensing or Assignment



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