

LYOPHILIZED EXTRACELLULAR VESICLE-LOADED HYDROGEL FOR THE TREATMENT OF INFLAMMATORY BOWEL DISEASE

A research group from IISPV, IGTP, CIBER and UAB has developed a new treatment system to avoid recurrence after intestinal resections in Crohn's disease patients

The Need

Currently, 50% of patients with Crohn's disease require at least one intestinal resection within 10 years of diagnosis. Despite surgery and postoperative recurrence prophylaxis, inflammation persists in the mesenteric fat, which acts as an inflammatory reservoir ("creeping fat") and contributes to disease recurrence in up to 80% of these patients, many of whom require a second surgery.

In addition to its limited long-term efficacy, current systemic therapies, such as immunosuppressants and biologic agents, present significant limitations, including widespread adverse effects.

Therefore, the development of effective strategies to prevent disease recurrence and to avoid repeated intestinal surgeries in these patients is essential.

The Solution

This invention presents a novel therapeutic system that reverses the inflammatory phenotype of mesenteric fat in patients with Crohn's disease in order to prevent recurrence following intestinal resections.

The invention consists of a three-dimensional (3D) matrix prototype enriched with extracellular vesicles (EVs) derived from mesenchymal stem cells (MSCs) from healthy donors. This extracellular matrix, enriched in extracellular vesicles, can be lyophilized and stably stored at room temperature for extended periods. Upon rehydration, it is implanted at the resection site, enveloping the adipose tissue surrounding the resection margin to prevent the development of inflammatory processes in this area.

This strategy is specifically designed to target inflamed perilesional adipose tissue, known as "creeping fat," a key component in disease progression and postsurgical recurrence.

Innovative Aspects

In contrast to current approaches, this invention presents the following innovative features:

Targeted therapy: It directly addresses the inflamed perilesional adipose tissue through the intraoperative application of a biomaterial matrix enriched with extracellular vesicles (EVs), designed to neutralize residual inflammation, prevent postoperative recurrence, and reduce the risk of other complications during the postoperative course.

Localized and sustained therapeutic action: Treatment with the matrix enables more precise and safer immune modulation compared to conventional cellular or systemic therapies and promotes restoration of the intestinal mucosa. Experiments conducted in animal models demonstrate the maintenance of its activity over prolonged periods.

Integration with standard clinical management: It does not require a specific additional surgical procedure, as it is administered during the intestinal resection.

Ease of use: Lyophilization of the biomaterial matrix facilitates storage and clinical use, improving feasibility and implementation in hospital settings.

Overall, this technology represents a paradigm shift in the treatment of Crohn's disease and may be applicable to other chronic inflammatory pathologies requiring targeted tissue regeneration strategies.

Intellectual Property:

- Priority European patent application filed (January 2026)

Aims

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

Contact details