

## Novel multilayer dressing for compromised wound healing

The Spanish National Research Council (CSIC) in collaboration with Fundación Rioja Salud (FRS) and Universidad de Alcalá de Henares (UAH) have developed a multilayer dressing that improves compromised wound and ulcers healing, in particular this dressing is suitable to treat patients with diabetes, elderly patients and/or people with reduced blood flow. The dressing comprises at least two bio-functionalized layers formed by biodegradable and bioadsorbable polymers which serve as support and allow a controlled release of bioactive compounds.

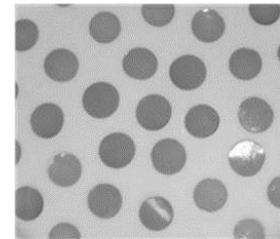
*An industrial partner for a license agreement is sought*

### Effective revascularization and healing

In wound healing process is well known the effectiveness of compounds such as proadrenomedullin N-terminal 20 peptide (PAMP) with antimicrobial and proangiogenic properties and bemiparin which acts as a thrombotic and / or restenosis modulator. For the first time, the effective action of these two compounds has been combined in a novel multilayer dressing developed by CSIC, FRS and UAH. This dressing is formed by an inner layer composed by a hydrogel impregnated with PAMP and an outer layer which contains bemiparin nanoparticles in a biodegradable polymer or copolymer.

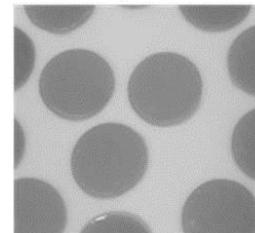
The developed system allows a sequential and controlled release of the bioactive compounds allowing an effective revascularization and healing of compromised wound.

*In vivo* experiments have been performed demonstrating an important improvement of wound healing.



Dehydrated hydrogel

H<sub>2</sub>O



Hydrated hydrogel

### Main applications and advantages

- These dressings are **biodegradables, bioadsorbables and biocompatible**.
- **Controlled and sequential release:** bioactive compounds release can be controlled by layers degradation process.
- **Optimum arrangement:** where bemiparin loaded nanoparticles are contained in outer layer of this dressing and PAMP in the inner layer formed by the hydrogel. This arrangement enables wound healing by reepithelialization rather than by wound contraction.
- **Suitable mechanical properties:** enabling dimensional stability of dressing during sequential release of bioactive compounds.
- **Versatility:** the wound dressing can contain additional layers like for example an adhesive layer to enable fixation to the body and also other active compounds such as antibiotics, anti-inflammatory agents, growth factors, etc. can be incorporated.

### Patent Status

PCT ("International") application filed. Priority established by a Spanish patent application.

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