

New nanostructured material for tissue regeneration

A new ion release system for revascularization and tissue regeneration based of calcium phosphate glass nanoparticles has been patented and developed. Partners to further develop the technology and/or to establish commercial agreements along with technical cooperation are sought.

The Challenge

Phosphate glasses have gained great interest as biomaterials not only because their chemical composition can be tailored to control their solubility or biodegradability, but also because these glasses can be synthesised to include modifying oxides that are able to induce a specific biological response and enhance biocompatibility. Some of the potential clinical applications of these glasses are: bone cavity fillers, drug delivery systems, biodegradable and bioactive phase in composites for tissue engineering scaffolds and bone fixation devices.

Vascular ulcers (caused by diabetes, pressure or ischemia) are among the highest prevalence chronic wounds (2%) and comprise the majority of unhealed wounds in elderly population (> 65). Although at present there are many dressings for healing dermal ulcers, none of them regenerates the wounded skin. Nowadays the latest treatments for skin healing and regeneration are based on cell therapy and the application of growth factors. These approaches are complex and costly.

The Technology

The technology proposed represents a new process for the preparation of a novel calcium phosphate glass that enhance the biomedical properties in a cost-effective way. This new method has been used in the development of biodegradable dressings based on polylactic acid (PLA), a well known biodegradable polymer, FDA approved in various biomedical applications. This polymer has never been used before for dermal dressings. The novelty of the material lies on the incorporation of soluble calcium phosphate glass nanoparticles as a ion release agent. These particles elaborated by a sol-gel process are embedded within the polymer matrix creating a mesh fabricated by the electrospinning technique.

Innovative advantages

- A dressing that regenerates the affected tissue by its revascularization and by promoting the migration of fibroblastic cells due to the ion release system.
- Ability to regenerate the dermis without using biological agents such as cells, protein, peptides or growth factors.
- A decreased healing and tissue regeneration time in ulcer treatment, together with revascularization of the wounded area reduces the percentage of relapses.
- All these advantages allow a significant reduction in costs production.

Current stage of development

Different studies have been made to confirm the proof of concept. Both cell in vitro and in vivo studies have shown the angiogenic potential of these biomaterials.

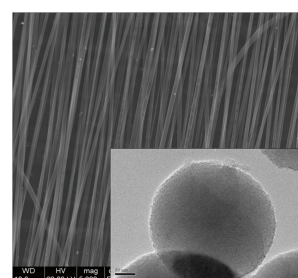
Applications and Target Market

- This technology allows to obtain a new nanomaterial useful as a tuneable control ion release agent with specific target cell signalling. Relevant to the use for bone or vascular tissue regeneration.
- It could be of interest for pharmaceuticals and biomaterials Research and Development companies.

Reference number

MKT2011/0030_H

A biodegradable dermal dressing based on polylactic acid useful for vascular ulcers



The calcium phosphate glass nanoparticles work as ion release agent

No biological agent to promote the tissue regeneration is required

Business Opportunity

Technology available for licensing with technical cooperation

Patent Status

European patent application

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