

DERMOGLASS: Biodegradable microparticles for chronic ulcers regeneration

The Challenge

Ulcers are lesions generated by epithelial damage caused by a vascular pathological process. These are mobility-hampering, painful wounds with high recurrence rates, and chronic evolution with little or no tendency to spontaneous heal. Between 13 and 23 million people worldwide suffer from chronic wounds. Chronic ulcers are a huge burden to the national healthcare systems (about 5% of the EU healthcare budget). A significant portion of the resources devoted to chronic ulcers care is wasted because current treatments are inefficient since they address chronic wound complications but do not directly promote healing. Ulcer healing is achieved, in average, after 28-29 weeks of treatment. Notwithstanding this, around 30% of ulcer do not heal. Moreover, up to 22% of treated ulcers deteriorate despite the treatment. In the case of diabetic foot ulcers, the rate of recurrence can reach 60%.

The Market

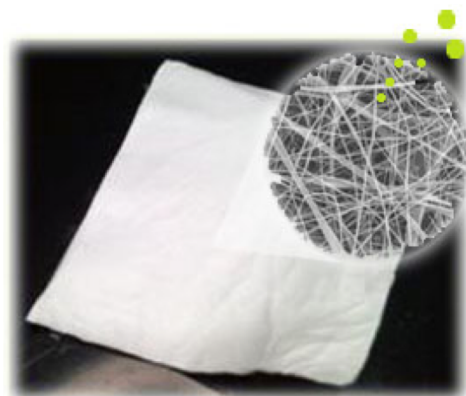
The worldwide Skin Ulcer Treatment Market reached revenues of over 7 billion in 2013, representing 41% of the Global Wound Care Market. The prevalence of chronic ulcers in Spain was estimated around 315.000 cases in 2016, 6 million worldwide. The main treatment option for chronic ulcers are the advanced wound care topic products (60% of the global chronic ulcers market) which include specialized dressings such as films, foams and hydrogels. The advanced topic products market is characterized by high revenues (over \$3,4bn) and is rapidly growing (53% increase over the past 6 years). The demand for advanced topic products is expected to rise steadily over the next 10 years, primarily driven by the increased incidence of chronic ulcers mainly attributed to an aging population and a diabetes rise.

The Asset

Biodegradable microparticles have been developed to release specific bioactive concentrations of calcium ions to stimulate the re-vascularisation of the affected area, thus targeting the main cause of chronic ulcer, the impaired vascularization. The restored blood supply promotes the arrival of oxygen, nutrients and new cells, leading to the repair of damaged tissue and healed wounds. Developed microparticles can be delivered to the affected area by means of a polymeric dressing, an hydrogel cream or a nebulized spray.

Product opportunity

Meta-analysis on clinical studies performed on most relevant state-of-the-art products conclude that there is no evidence that any existing dressing is more effective in healing ulcers than the others. In contrast, our developed microparticles has shown higher efficacy compared to a commercial widely used advanced dressing in a diabetic mice model. Our technology is able to modify the physiological conditions of the damaged area to enhance angiogenesis and promote cell recruitment, without the use of biological agents such as cells, proteins or drugs.



Scientific Project Leader

Dr. Elisabeth Engel
(<http://ibecbarcelona.eu/biomaterials>)

Stage of Development

Wound healing and neovascularization characterized in vitro (CAM assay) and in vivo (diabetic mice model).

Currently evaluating efficacy on wound pig model.

Intellectual Property Status

EP17382325.3. Controllable ion release calcium particles, method for producing same and use thereof. Elisabeth Engel, Oscar Castaño, Joan Martí, Josep A. Planell. Institut de Bioenginyeria de Catalunya, Universitat Politècnica de Catalunya.

Exploitation Plan

Licensing and/or co-development.

Contact

TechTransfer@ibecbarcelona.eu