IDF INNOV

From invention to innovation

ENZGEL : A DYNAMIC HYDROGEL WITH FINE-TUNED AND CONTROLLED RELEASE OF ACTIVE MOLECULES

ENZGEL, a dynamic hydrogel with customized enzyme-controlled sol/gel/sol transitions, offers both a new original wound care system and a new dynamic & controlled drug delivery system.

Controlled release of active molecules ▪ Wound care system ▪ Drug delivery system ▪ Topical application

APPLICATIONS

- Adapted for healthcare - Wound care management
- Topical drug delivery system of active molecules
- Cosmetic applications

DEVELOPMENT PHASE

- Validation as new wound care dressing solution: in vivo preclinical efficacy results and safety demonstrated in clinical study.
- Controlled release of active substances: in vitro data with small and large molecules and with antibacterial agents (antibiofilm activity).

INTELLECTUAL PROPERTY

3 patent families: WO2006/056700 (EP, US, JP, CA), WO2009/095562 (EP, US, JP, CA), WO2013/114047 (EP)

PUBLICATIONS

- Influence of enzymatic specificity on the behavior of ephemeral gels. Biomacromolecules 2008 Jan; 9(1):13-20.
- Mastered proteolysis of gelatin gel can control delivery kinetics of entrapped large molecules. Soft Matter 2012, 8, 4750–4755.
- Gelatin-alginate gels and their enzymatic modifications: controlling the delivery of small molecules. 2013 Jun;13(6):687-95.
- Ephemeral biogels to control anti-biofilm agent delivery: From conception to the construction of an active dressing. Mater Sci Eng C Mater Biol Appl. 2018 Jan 1;82:210-216

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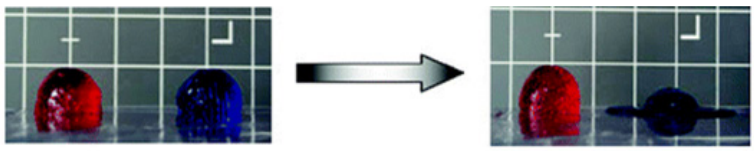
PRESENTATION

The present offer relates to the development of new type of gels, based on polysaccharides or denatured collagen, which are able to successively undergo sol-gel and then gel-sol controlled transitions under the action of two customized antagonistic enzymes, i.e. transglutaminase and protease. These gels are biodegradable after a determined time without any change in temperature or medium composition due to the defined concentrations and ratio between the two enzymes. This unique technology enables to fine-tuned and controlled release of small and large molecules or proteins, from 200 Daltons to 2 Million Daltons. These gels are easy to produce, handle and store. In healthcare area, it could be used as an original wound care system or a new dynamic and controlled drug delivery system. For example, antibacterial agent delivery could confer to the system a specific anti-biofilm activity. The potential of usage of these gels could also bring solutions in cosmetic area.



ENZGEL dynamic and controlled sol/gel/sol transitions

COMPETITIVE ADVANTAGES

- Elastic and biodegradable hydrogel,
- Enzyme controlled sol/gel/sol transitions allowing a time-controlled conformation change
- Customized fine-tuned and controlled release of active molecules
- Easy to produce, handle and store (sterilization and lyophilization)