UNIVERSITAT POLITÈCNICA DE CATALUNYA
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Servei de Gestió de la Innovació

# NANOENABLED HYDROGELS FOR ADVANCED SKIN CARE : SKinGEL

**A new a method for in situ self-assembling of NPs with phenolic-shell and biopolymers with nucleophilic groups into multifunctional nanocomposite hydrogel for enhancing wound closure and tissue recovery. (Skingel)**
Partners to further develop the system, pre- and clinical validation and/or to establish commercial agreements along with technical cooperation are sought.

## The Challenge

Chemically crosslinked hydrogel networks are formed by non-reversible covalent bonds between the polymer chains. Generally, this crosslinking is achieved by redox reactions, radical polymerisation, photo-polymerisation, click chemistry, Michael addition, Schiff's base reactions or enzymes. In spite of showing good mechanical performance for a wide range of applications, the utilization of toxic catalysts or crosslinkers, and harsh conditions is a major drawback that makes them unsuitable for biomedical applications. The self-assembling occurs under mild conditions, avoiding the use of harsh chemicals and thereby is suitable for a preparation of materials with wide range of medical applications. Self-assembled hydrogels demonstrate high biocompatibility and can be explored for the in situ incorporation of bioactive agents and cells within the matrix. Up to date, most of the self-assembled hydrogels possess poor mechanical properties, slow self-healing properties or require costly and hardly scalable synthesis of the components, which have limited their application in biomedical engineering.

## The Technology

•SKinGEL are biopolymer hydrogels for advanced skin care targeting multiple factors in skin pathologies, such as deleterious enzyme activities, bacterial load and reactive oxygen species.

•The versatile nanoparticle (NP)-driven self-assembling technology of SKinGEL uses metal-phenolic NPs as bioactive and structural element in biocompatible, self-healing and injectable hydrogel matrices.

•SKinGEL is validated for treatment of chronic wounds ex-vivo in wound exudates and in vivo in diabetic and non-diabetic animal models showing complete tissue remodeling and restoration of skin integrity.

•The engineered nano-enabled hydrogels are also ideal candidates for cell-based and drug delivery therapies, tissue engineering and regenerative medicine applications.

## Innovative advantages

•SKinGEL answers the unmet need for efficient multifunctional skin care materials to improve patients' quality of life.

•SKinGEL is a (bio)nanotechnology-embedded skin care product providing a holistic therapeutic approach towards healthy skin.

## Current stage of development

Laboratory validation. It's required a pre-clinical validation.

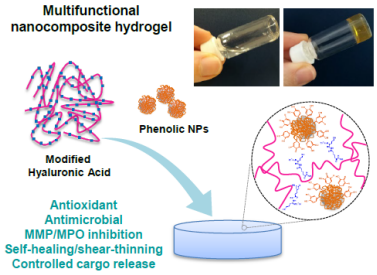
## Applications and Target Market

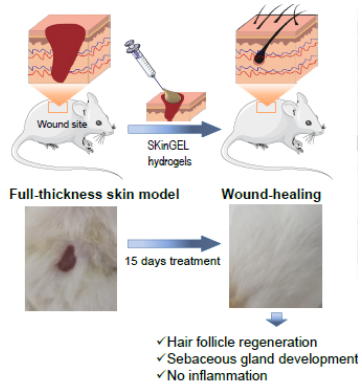
Fast self-assessment (Rapid Diagnostic Kit) / Point-of-care (PoC) tests for infection in out-hospital conditions, performed by patients suffering from:

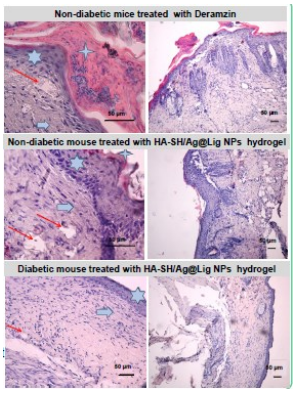
- Chronic wounds
- Chronic obstructive pulmonary disease (COPD)
- Adverse cardiac events

## Reference number

MKT2021/0182_H




## Business Opportunity

Technology available for licensing with technical cooperation

## Patent Status

Priority application

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