Silk fibroin aerogel particles for chronic wound healing

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Chronic wounds are one of the most debilitating complications significantly affecting patients' life quality and constituting a huge burden for health care systems, representing approximately 3% of total healthcare expenditure in developed countries.[1] These result in a challenge to wound care professionals, which need to implement patient-specific approaches based on a particular healing phase and its condition. During wound healing, exudate is produced as a natural response towards healing. However, an excessive production can be detrimental, representing a challenge for wound management.

Aerogels can provide advanced performance for wound healing due to their high porosity and large surface area, which can be tailored for a fast and directional fluid transfer. They can also act as a carrier for bioactive compounds.[2] Silk fibroin has good mechanical properties and supports well the human keratinocytes and fibroblast being used for the treatment of wounds.[3] In this work, silk fibroin gel particles are developed for future controlled release of bioactive agents in an attempt to trigger the healing process in chronic wounds.

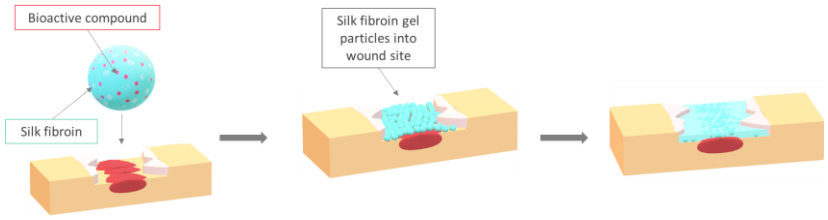

Figure 1: Scheme of application of silk fibroin aerogel particles in wound environments.

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