**Workshop on Aerogels Characterization and Modelling**

**29-31 March 2023**

**Debrecen, Hungary**

# GENERAL INSTRUCTIONS FOR ABSTRACT SUBMISSION

The abstract deadline is March 10, 2023. Please indicate whether you prefer oral presentation or poster. Since usually the abstracts submitted with preference for oral presentation are more than those that can be accommodated in the program, the Members of the Organizing and the Scientific Committees will decide by March 15, 2023 whether the contribution will be scheduled for oral or poster presentation. If a formal acceptance of the abstract is needed at an earlier date, please indicate so in the e-mail with the abstract submission.

Abstracts should be no longer than two pages. Abstracts that do not meet these formatting requirements will be returned. The Organizing Committee reserves the right to edit abstracts for clarity or correctness of English, but will consult the author if any significant changes are needed. Please save your file as **PRESENTING AUTHOR NAME.doc or .docx** and upload it at the end of the registration form. The abstracts will appear in the book of abstracts in .pdf format.

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# *In vitro* assessment of Silk Fibroin Aerogel Particles loaded with Adenosine for Wound Healing

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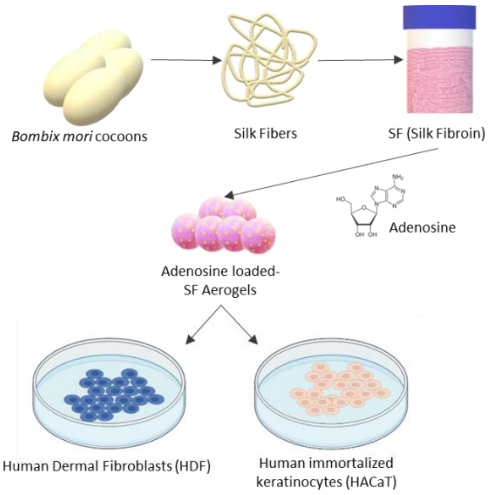
## GRAPHICAL ABSTRACT




## ABSTRACT

Chronic wounds represent a significant challenge in the fields of healthcare and therapy. These types of wounds do not heal within a typical timeframe and require a specific and targeted approach to their treatment. Bio-based aerogels, from natural polymer sources, 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 of the exudate; also, they can act as carriers for bioactive compounds.[1] Silk fibroin (SF) protein is an excellent biomaterial for aerogel production. It can serve as a carrier of bioactive compounds while supporting cell proliferation, being presently used in wound healing and regeneration. Keratinocytes and fibroblasts are two types of cells that play important roles in the process of wound healing and regeneration, assisting in the construction of a new matrix and skin tissue repair.[1,2]

Keratinocytes are the most abundant type of skin cells and can be found in the external layer of the skin.[2] Fibroblasts are connective tissue cells that are responsible for collagen production.

In this work, we study the *in vitro* behaviour of Human Dermal Fibroblasts (HDF) and Human immortalized keratinocytes (HACaT) when in contact with SF aerogel particles loaded with Adenosine (ADO). ADO is a nucleoside that promotes angiogenesis and regeneration.[3] For particle production, different concentrations of SF (3%, 5% and 7%(w/v)) and different ratios of ADO were used. ADO and ADO-loaded aerogel particle biocompatibility was evaluated by direct contact with HDFs and HaCats. Quantitative data were subjected to an analysis of variance (one-way ANOVA, Tukey's test; $\alpha$=0.05). Different concentrations of ADO (0.1-2 mg/ml) were used to understand the viability of cells. Preliminary findings suggest that as the concentration of ADO increases, it enhances the cellular growth of HDF. However, for HaCat, the lowest concentrations of ADO promote cellular growth. The preliminary results also indicate that the ADO-loaded aerogel particles exhibit similar behavior. Considering the antagonistic behavior of the two cell lines in response to ADO, it is plausible that the developed particles have the potential to treat both deep and shallow wounds, depending on the dosage of ADO incorporated in each particle. In the future, further tests will be carried out by studying the particles in endothelial cells.

## ACKNOWLEDGEMENTS

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