2º Encontro Ibérico de Fluidos Supercríticos
Encuentro Ibérico de Fluidos Supercríticos
EIFS2022
Coimbra (Portugal), February 28 – March 2, 2022

GENERAL INSTRUCTIONS FOR ABSTRACT SUBMISSION (please delete this page before abstract submission)

The abstract deadline is December 21st, 2021. In the submission email, please clearly 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 January 31st, 2022, whether the contribution is scheduled for oral or poster presentation. Please note that there will be ample time for discussion of posters built into the conference schedule.

The submission of more than two papers by the same presenting author will not be admitted. Once the abstract is accepted, you should register and pay the registration fee by the deadline of February 15th, 2022. Otherwise, the abstract will not appear in the program. If you need to receive a formal acceptance of your abstract earlier, please write this in your e-mail when you submit your abstract and you will receive a prompt reply.

The limit for your abstract is 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 send it to the Conference Secretariat (eifs2022coimbra@gmail.com). The abstracts will appear in an Abstract Book in the pdf format.

I would prefer:

X Oral

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Development of self-assembled silk fibroin particles for wound healing

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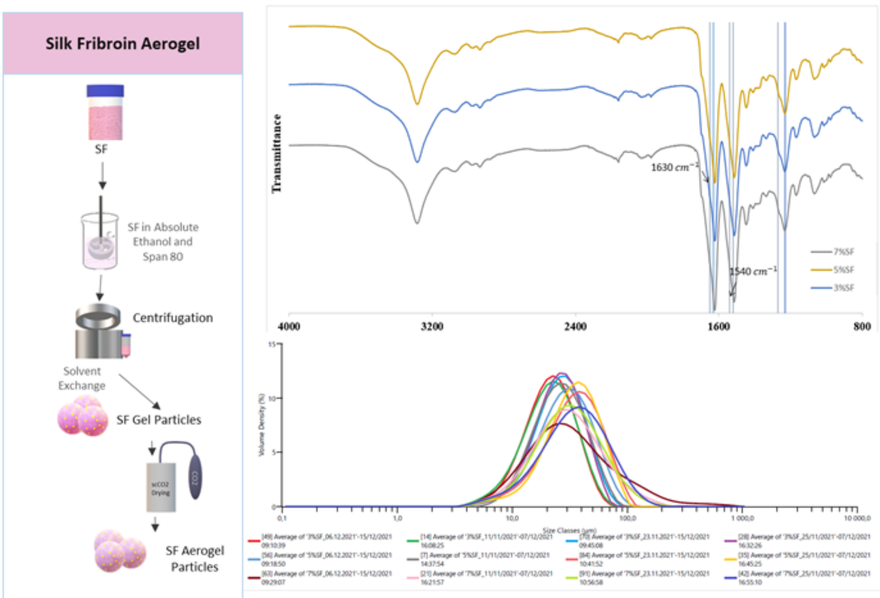
GRAPHICAL ABSTRACT



ABSTRACT

Chronic wounds are one of the major therapeutic and healthcare challenges. The design and development of biocompatible, biodegradable and adaptable materials that promote the tissue repair, prevent the infection and inflammation and ensure the management of exudate are a constant need for wound management.[1] Aerogels are nanostructured dry materials with high porosity, large surface and low bulk density [2]. Aerogels can provide advanced performance for wound healing due to their high porosity, large surface area and water uptake, which can be tailored for a fast and directional fluid transfer of the exudate. Aerogels can also act as carriers for bioactive compounds. [1] SF obtained from Bombyx Mori has demonstrated to be an excellent stabilizer of bioactive compounds while supporting cell proliferation, being presently used in wound healing and regeneration.[3] In this work, silk fibroin (SF) aerogel particles were developed and studied in terms of textural properties to evaluate their potential as potential drug loading for wound healing applications.

Silk fibroin extracted from Bombyx mori cocoons was used to prepare SF aerogel particles. The particles production was based on the method used by Bessa, P et al. 2010 [4]. SF aqueous solutions at different concentrations (3%, 5% and 7%(w/v)) were introduced into an Absolute Ethanol and Span 80 surfactant (3 wt.% SF solution), followed by CO_2 supercritical drying. For the characterization of the SF particles, Particles Size distribution were determined with a particle sizer analyzer (Mastersizer 3000E, Malvern, UK). Fourier Transform Infrared with Attenuated Total Reflectance (FTIR-ATR) spectroscopy were used to investigate the secondary structure formation and conformation and chemical structure. Textural properties will be assessed by helium pycnometry and N2 adsorption-desorption (BET) tests. In vitro tests will be performed using human skin cells to access the cell viability and therapeutic effects of the developed systems.

SF gel particles were produced using different concentrations of SF. Ethanol was added to a goblet at a ratio of 2:1 (v/v) in relation to SF Solution. Span 80 was used as surfactant (**3 wt.%** SF Solution). The solution was homogenized by mechanical stirring at 600 rpm. The SF solution was added drop by drop to ethanol solution.

The diameter of the particles (Dv10 and Dv90) was 11.8 ± 0.1 µm and 43.1 ± 0.5 µm for 3% SF aerogel particles, 14.2 ± 0.0 µm and 59.1 ± 0.7 µm for 5% SF aerogel particles and 12.6 ± 0.1 µm and 81.8 ± 1.5 µm for 7% SF aerogel particles considering the average size. According to ATR-FTIR analysis, it was possible to verify the presence of the main characteristic bands of SF assigned to the presence of β-sheet structure, characterized by strong bands on amide I and II regions.

Physicochemical and textural characterization of the aerogels will be performed to understand if this method is suitable to produce particles for wound healing. In the future, we intend to load these particles with pharmaceutical drugs relevant for wound healing applications.

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