

# Biohybrid Solutions for Burn Care: Merging Silk Medical Textiles with Decellularized Matrices



CATOLICA  
FACULTY  
OF BIOTECHNOLOGY

PORTO



Teresa Sousa,<sup>1</sup> Inês Vale,<sup>1</sup> Marta Rosadas,<sup>1</sup> Inês V. Silva,<sup>1</sup> Viviana P. Ribeiro,<sup>1\*</sup> Ana L. Oliveira<sup>1</sup>

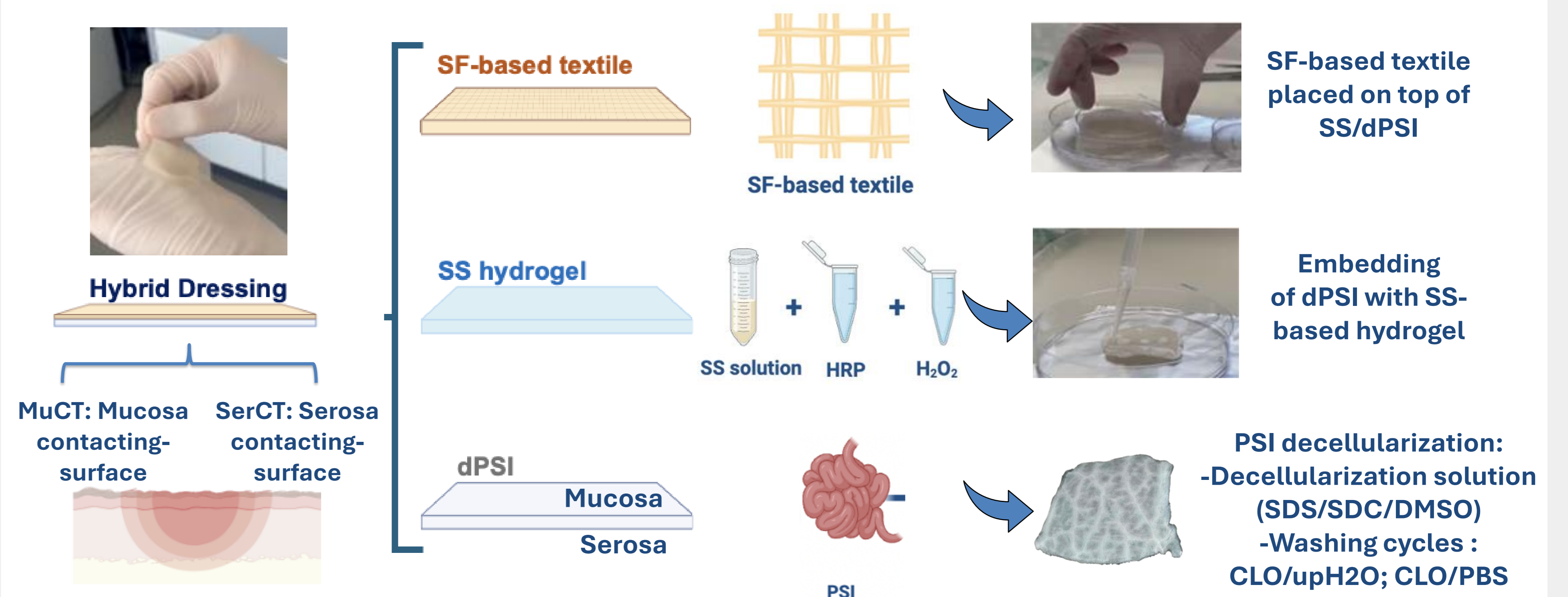
1CBQF-Centro de Biotecnologia e Química Fina-Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa, Porto, Portugal

\* vpribeiro@ucp.pt

## Introduction

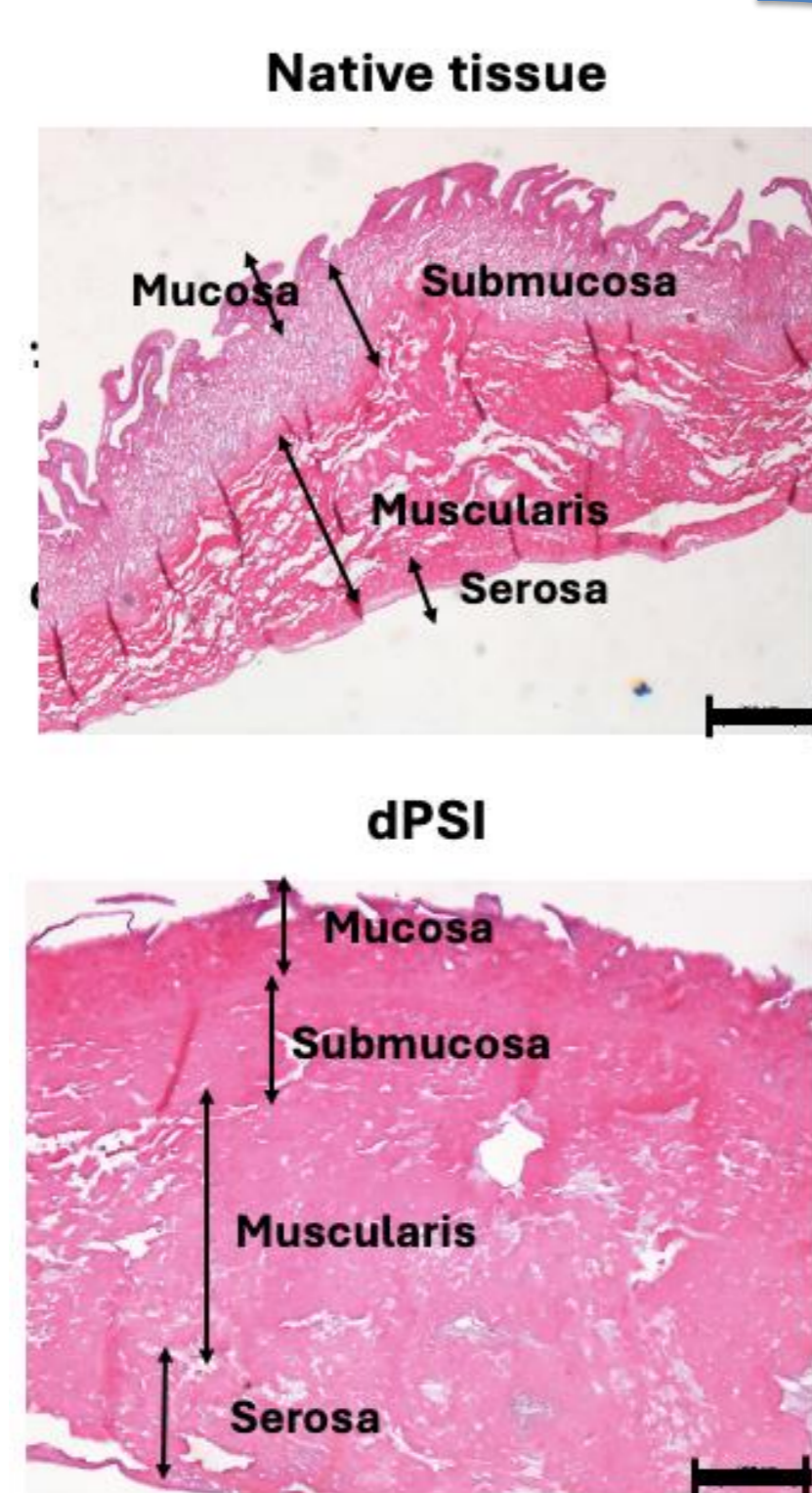
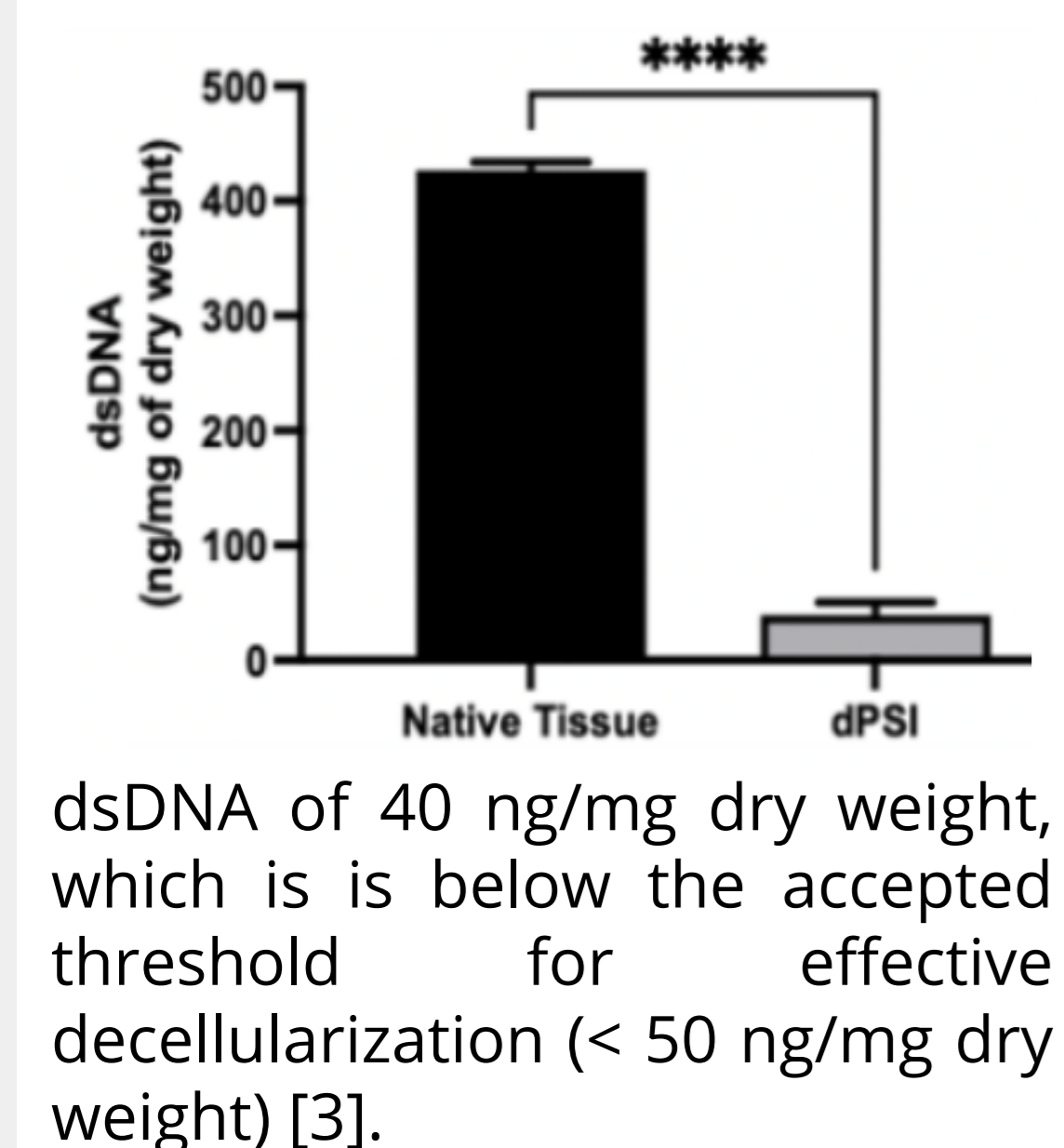
Burn injuries affect over 11 million people annually, causing around 180,000 deaths worldwide [1]. We present a multilayer burn wound dressing that promotes wound healing and skin regeneration. The construct integrates silk fibroin (SF) fabric for structural support, decellularized porcine small intestine (dPSI) for bioactivity [2], and a silk sericin (SS) hydrogel as an intermediate layer, enhancing cohesion and providing anti-inflammatory effects. Together, the SF textile, dPSI matrix, and SS hydrogel create a bioactive hybrid dressing with strong potential as an advanced solution for burn wound treatment and skin regeneration.

## Methods

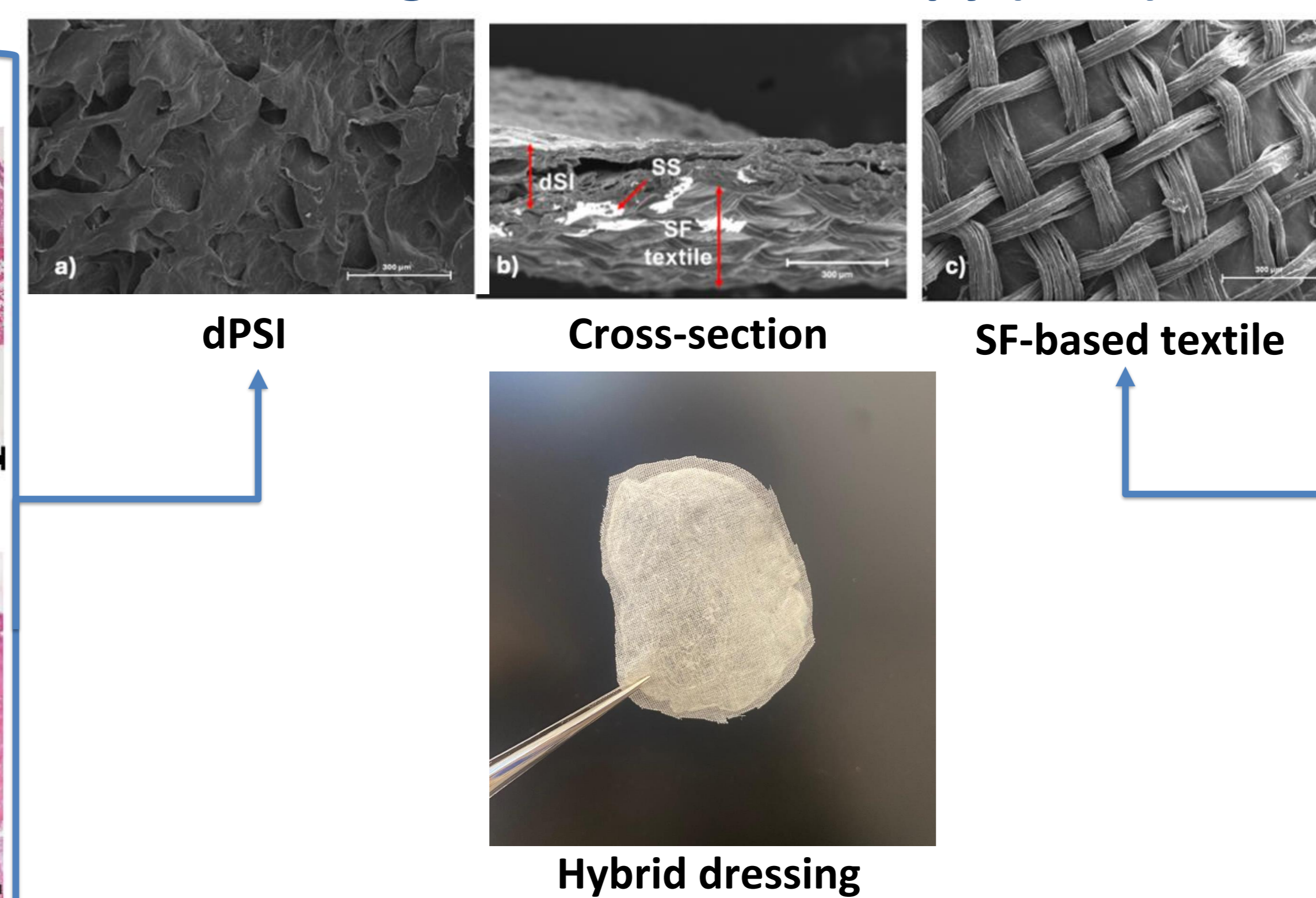


## Results and Discussion

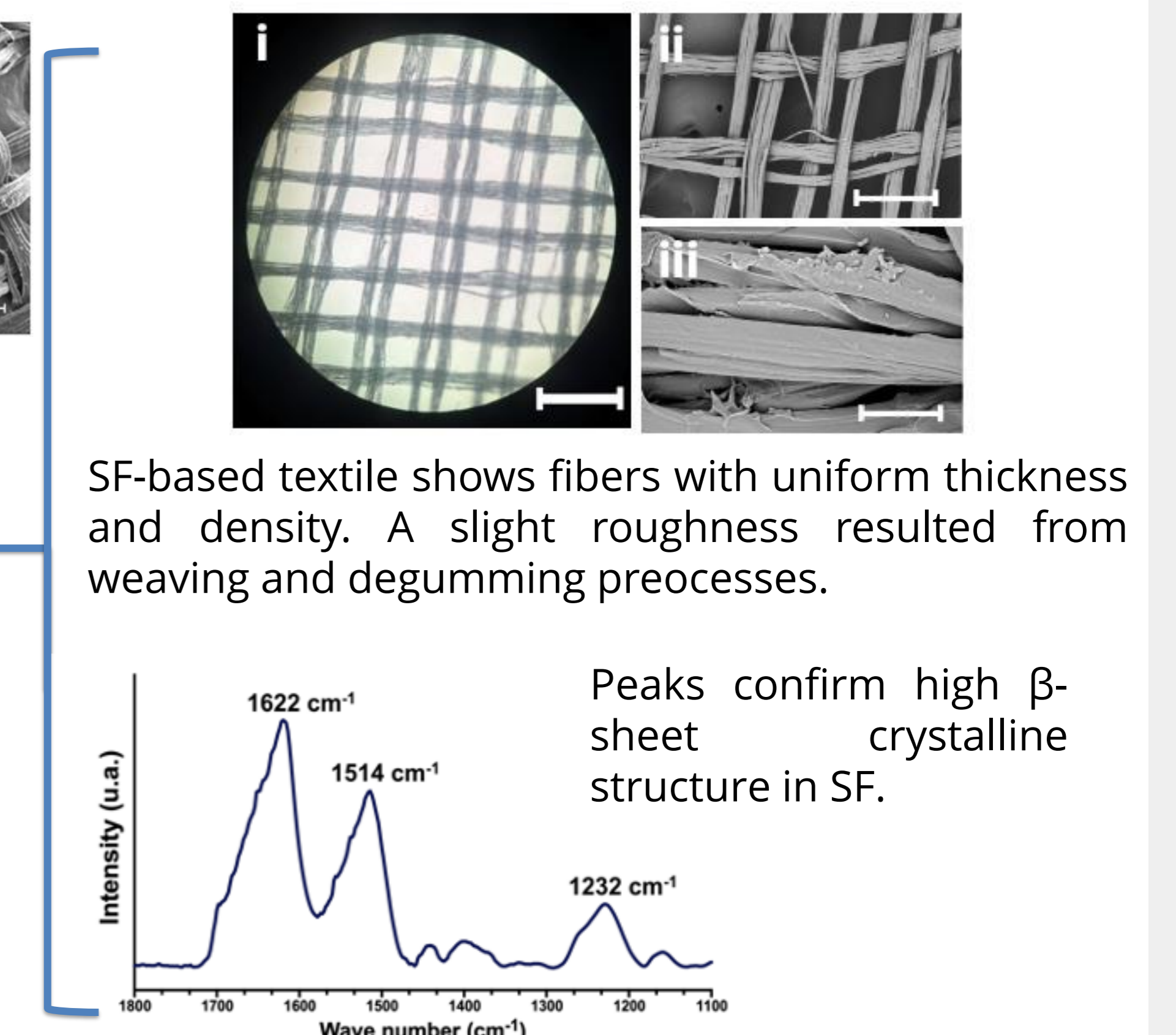
### Decellularization Efficiency of PSI



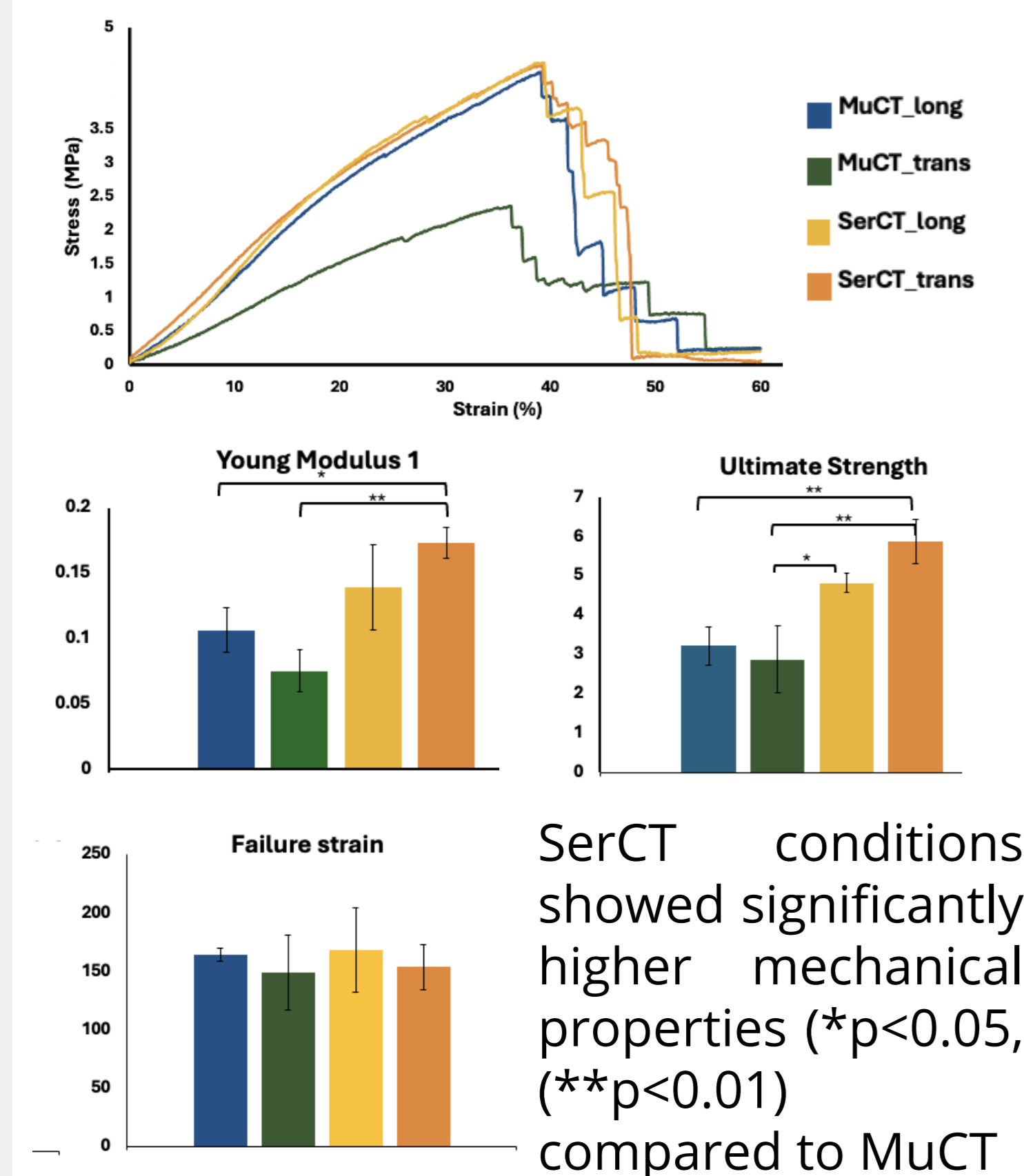
### Scanning Electron Microscopy (SEM)



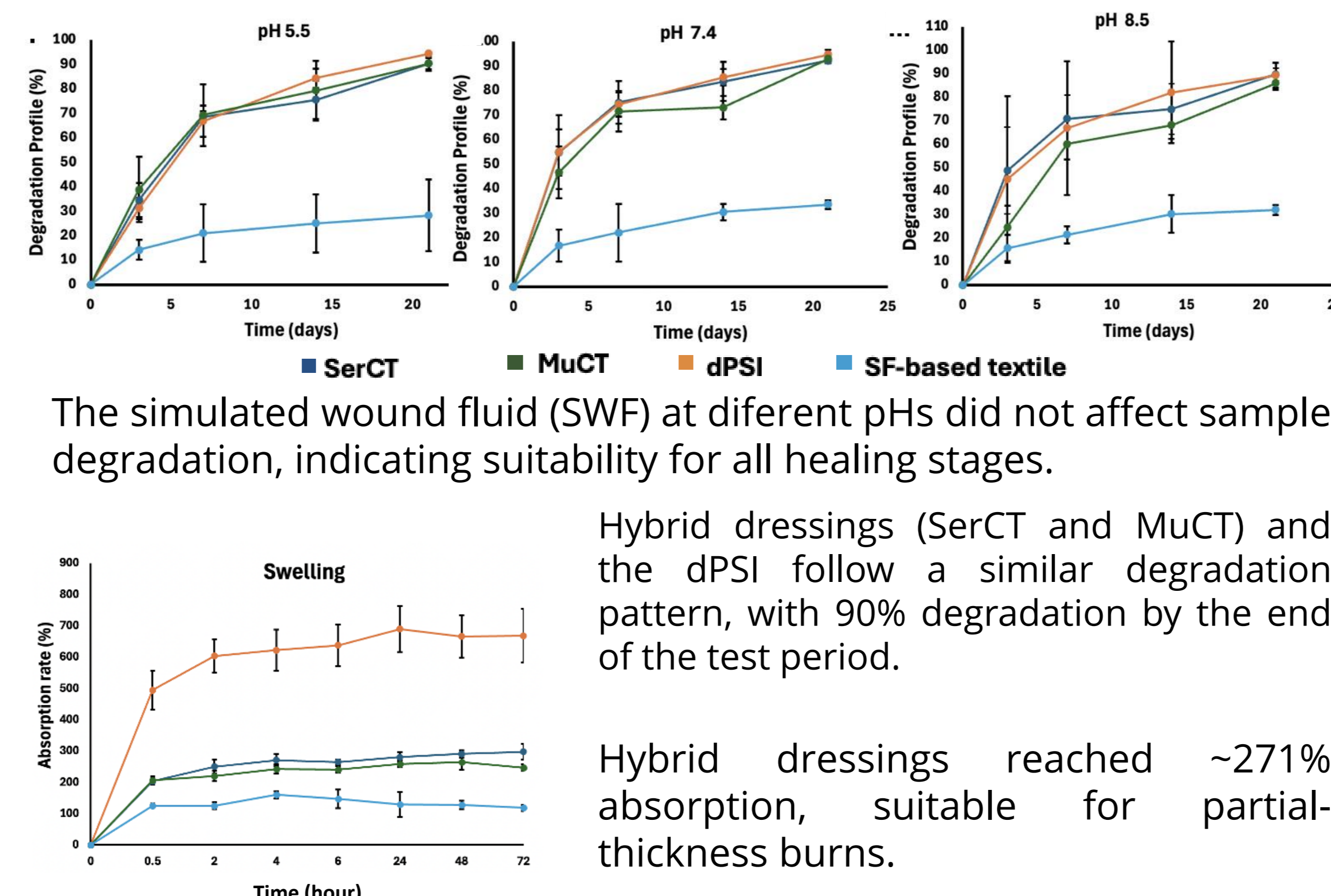
### SF-based Textile Characterization



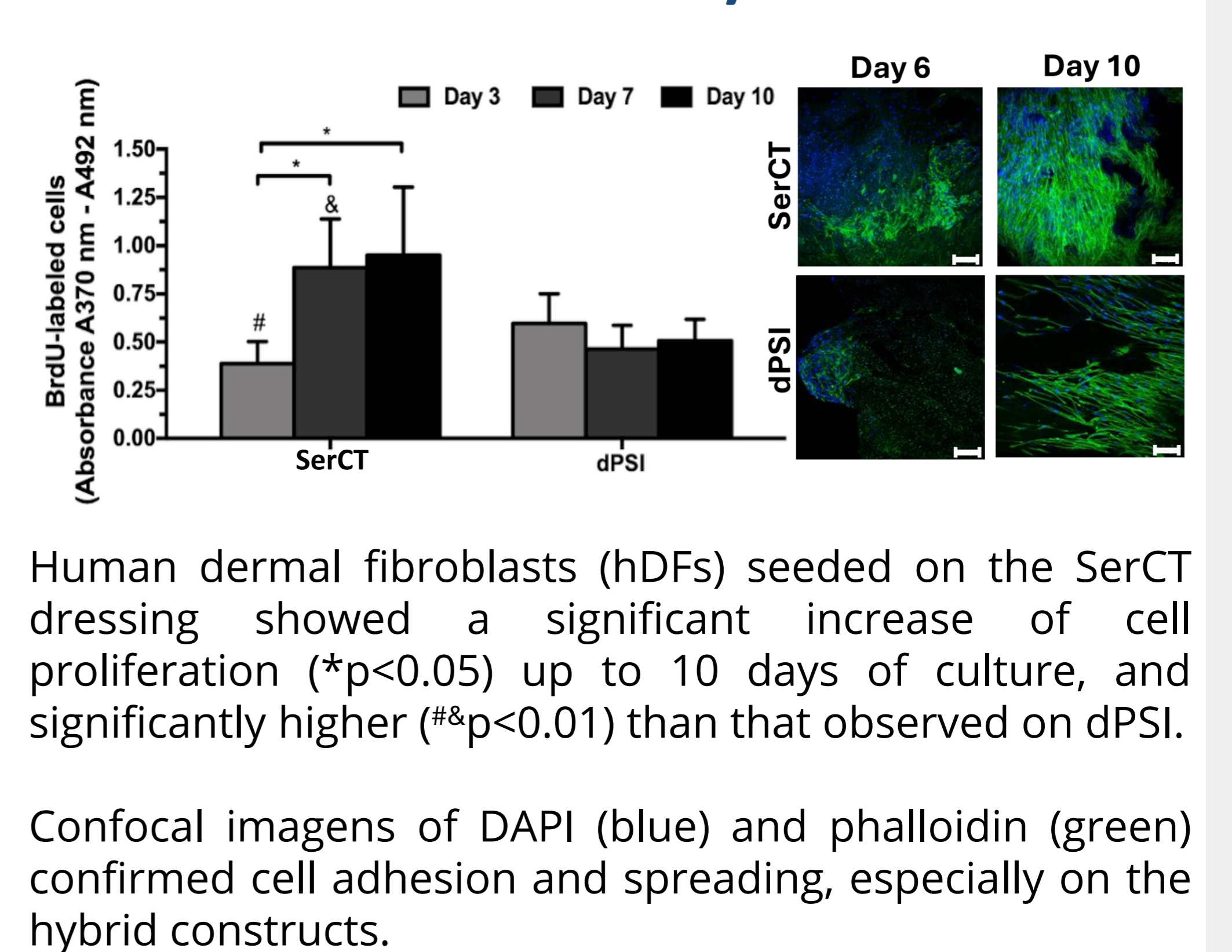
### Mechanical Properties



### Sample Stability



### In Vitro Analysis



## Conclusions

The hybrid dressings exhibit structural stability, strength and flexibility, enabling adaptation to the wound environment and supporting healing. In vitro assessment reveal a superior performance from SerCT hybrid dressing in hDFs proliferation, induced by the combined bioactivity of SS-based hydrogel and dPSI. This study is pioneer in confirming promising results for the first multilayer hybrid dressing combining medical textiles, SS-based hydrogel and dPSI for burn wound applications.

### Acknowledgements

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### References

- [1] Markiewicz-Gospodarek et al (2022) <https://doi.org/10.3390/ijerph19031338>
- [2] Rosadas, M et al (2023) <https://doi.org/10.3389/fmats.2023.1285948>
- [3] Crapo, P. M. (2011) <https://doi.org/10.1016/j.biomaterials.2011.01.057>