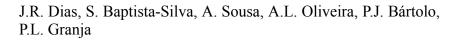
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## Biomechanical performance of hybrid electrospun structures for skin regeneration

J.R. Dias<sup>1,2,3,4\*</sup>, S. Baptista-Silva<sup>5</sup>, A. Sousa<sup>1,3</sup>, A.L. Oliveira<sup>5</sup>, P. J. Bártolo<sup>7</sup>, P.L. Granja<sup>1,3,4,6</sup>

<sup>1</sup> i3S - Instituto de Investigação e Inovação em Saúde, Universidade do Porto, Porto, Portugal

- <sup>2</sup> Centre for Rapid and Sustainable Product Development (CDRsp), Polytechnic Institute of Leiria, Leiria, Portugal
- <sup>3</sup> INEB Instituto de Engenharia Biomédica, Universidade do Porto, Porto, Portugal
- <sup>4</sup> ICBAS Instituto de Ciências Biomédicas Abel Salazar, Universidade do Porto, Porto, Portugal
- <sup>5</sup> CBQF Center for Biotechnology and Fine Chemistry, School of Biotechnology, Portuguese Catholic University, Porto, Portugal
- <sup>6</sup> Faculdade de Engenharia da Universidade do Porto (FEUP), Porto, Portugal
- <sup>7</sup> School of Mechanical, Aerospace and Civil Engineering & Manchester Institute of Biotechnology, University of Manchester, UK

\*Corresponding author at Biomaterials for Multistage Drug & Cell Delivery Group, Instituto de Investigação e Inovação em Saúde, Universidade do Porto, Rua Alfredo Allen, 208, 4200-135 Porto, Portugal . Phone number +351 220 408 800, Fax +351 226 094 567, e-mail address:jrdias.juliana@gmail.com

## Abstract

Wound dressings made by electrospun nanofibers have been demonstrating great potential to regenerate skin tissue as compared to the conventional membrane products available in the market. Until today most of the developed dressings have only demonstrated the capability to regenerate the dermis or epidermis. In this study we propose new hybrid electrospun meshes combining polycaprolactone and gelatin. Several approaches, multilayer, coating and blend were stablished to investigate the most appropriate hybrid structure with potential to promote skin regeneration in its full thickness. The structures were evaluated in terms of physico-chemical properties (porosity, water vapour permeability, contact angle and swelling degree) and according to its mechanical and biological performance. Multilayer and blend structures demonstrated to fit most of native skin requirements. However, looking to all the performed characterisation we considered multilayer as the most promising hybrid structures, due its high porosity which contributed to an ideal water vapour permeability rate and good mechanical and biological properties. Based on this multilayer structure is a promisor wound dressing.

**Keywords:** Hybrid structures; electrospun meshes; wound dressings; ECM; skin regeneration.

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