

Accepted Manuscript

Title: Cellulose acetate based 3-dimensional electrospun scaffolds for skin tissue engineering applications

Author: Deniz Atila Dilek Keskin Ayşen Tezcaner

PII: S0144-8617(15)00627-X
DOI: <http://dx.doi.org/doi:10.1016/j.carbpol.2015.06.109>
Reference: CARP 10100



To appear in:

Received date: 23-2-2015
Revised date: 24-6-2015
Accepted date: 25-6-2015

Please cite this article as: Atila, Deniz., Keskin, Dilek., & Tezcaner, Ayşen., Cellulose acetate based 3-dimensional electrospun scaffolds for skin tissue engineering applications. *Carbohydrate Polymers* <http://dx.doi.org/10.1016/j.carbpol.2015.06.109>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 **CELLULOSE ACETATE BASED 3-DIMENSIONAL ELECTROSPUN SCAFFOLDS**
2 **FOR SKIN TISSUE ENGINEERING APPLICATIONS**

3 Deniz Atila¹, Dilek Keskin^{1,2}, Ayşen Tezcaner^{1,2}

4 ¹Department of Engineering Sciences, Middle East Technical University, Turkey

5 ²Biomaterials and Tissue Engineering Center of Excellence, Middle East Technical University,
6 Turkey

7 Corresponding Author: Ayşen Tezcaner

8 Tel:+90 312 210 4452

9 Fax:+90 312 210 4462

10 Email: tezcaner@metu.edu.tr

11
12 **Highlights**

- 13 • 3D CA/PULL scaffolds were produced via electrospinning for the first time.
14 • PULL was used for providing 3-dimensionality to the scaffolds.
15 • Hydrophilic PULL content of the scaffolds were removed to increase porosity.

16
17
18 **Abstract**

19 Skin defects that are not able to regenerate by themselves are among the major problems faced.
20 Tissue engineering approach holds promise for treating such defects. Development of tissue-
21 mimicking-scaffolds that can promote healing process receives an increasing interest in recent
22 years. In this study, 3-dimensional electrospun cellulose acetate (CA) pullulan (PULL) scaffolds
23 were developed for the first time. PULL was intentionally used to obtain 3D structures with
24 adjustable height. It was removed from the electrospun mesh to increase the porosity and
25 biostability. Different ratios of the polymers were electrospun and analyzed with respect to
26 degradation, porosity, and mechanical properties. It has been observed that fiber diameter,
27 thickness and porosity of scaffolds increased with increased PULL content, on the other hand this
28 resulted with higher degradation of scaffolds. Mechanical strength of scaffolds was improved
29 after PULL removal suggesting their suitability as cell carriers. Cell culture studies were
30 performed with the selected scaffold group (CA/PULL:50/50) using mouse fibroblastic cell line
31 (L929). In vitro cell culture tests showed that cells adhered, proliferated and populated

Download English Version:

<https://daneshyari.com/en/article/7787534>

Download Persian Version:

<https://daneshyari.com/article/7787534>

[Daneshyari.com](https://daneshyari.com)