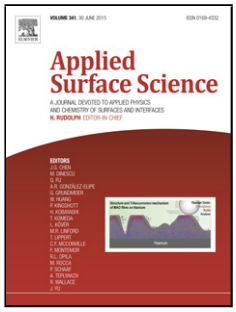
Accepted Manuscript



Title: Electrically responsive microstructured polypyrrole-polyurethane composites for stimulated osteogenesis

Authors: Catalin Romeo Luculescu, Adriana Maria Acasandrei, Cosmin Catalin Mustaciosu, Marian Zamfirescu, Maria Dinescu, Bogdan Stefanita Calin, Andrei Popescu, Diana Chioibasu, Dan Cristian, Irina Alexandra Paun

PII: S0169-4332(17)32797-6
DOI: http://dx.doi.org/10.1016/j.apsusc.2017.09.149
Reference: APSUSC 37228

To appear in: *APSUSC*

Received date: 24-5-2017
Revised date: 7-9-2017
Accepted date: 19-9-2017

Please cite this article as: Catalin Romeo Luculescu, Adriana Maria Acasandrei, Cosmin Catalin Mustaciosu, Marian Zamfirescu, Maria Dinescu, Bogdan Stefanita Calin, Andrei Popescu, Diana Chioibasu, Dan Cristian, Irina Alexandra Paun, Electrically responsive microstructured polypyrrole-polyurethane composites for stimulated osteogenesis, Applied Surface Sciencehttp://dx.doi.org/10.1016/j.apsusc.2017.09.149

Electrically responsive microstructured polypyrrole-polyurethane composites for stimulated osteogenesis

Authors: Catalin Romeo Luculescu[1,2], Adriana Maria Acasandrei[3], Cosmin Catalin Mustaciosu[3], Marian Zamfirescu[1], Maria Dinescu[1], Bogdan Stefanita Calin[1], Andrei Popescu[1], Diana Chioibasu[1], Dan Cristian [4] and Irina Alexandra Paun[*1,2]

Affiliations:

[1]National Institute for Laser, Plasma and Radiation Physics, CETAL, Magurele, RO-077125, Romania

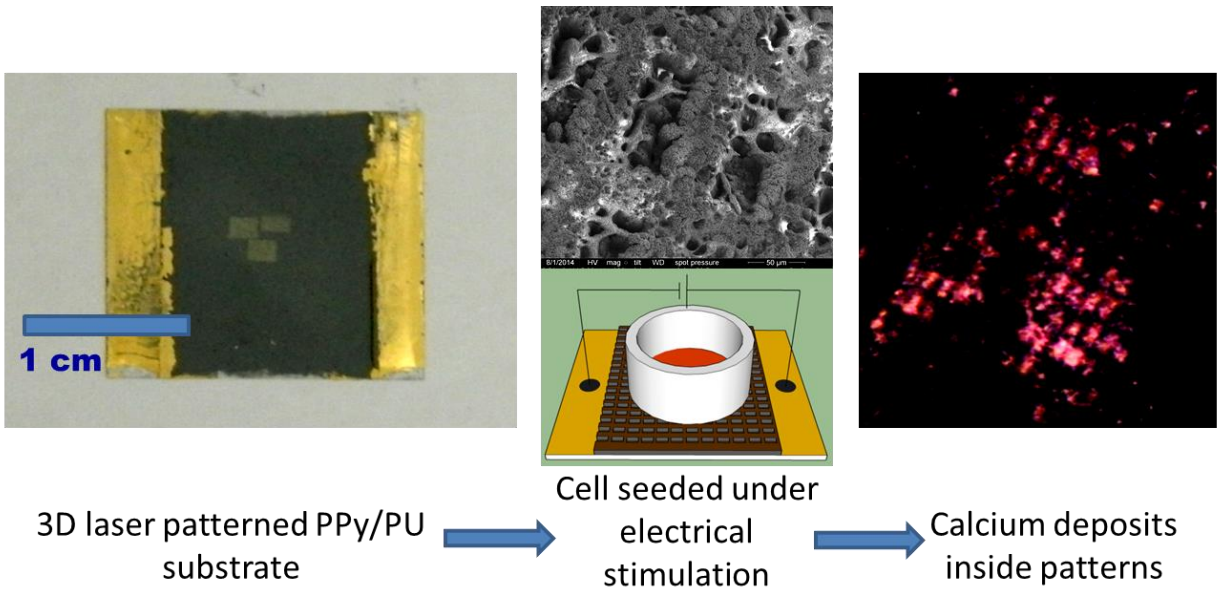
[2]Faculty of Applied Sciences, University Politehnica of Bucharest, RO-060042, Romania

[3]Horia Hulubei National Institute for Physics and Nuclear Engineering, Magurele, RO-077125, Romania

[4] Coltea Clinical Hospital, Ion C. Brătianu 1, Bucharest, Romania

[*]corresponding author: irina.paun@physics.pub.ro

Graphical abstract



Highlights

- Conductive PPy/PU blends with 3D patterns were obtained by laser-assisted techniques
- Guided osteoblast-like cells attachment in predefined 3D patterns
- Electrical stimulation of the cultured cells fastened the osteogenesis
- Calcium deposits were obtained inside 3D patterns

Abstract

In this work, we demonstrate the efficiency of substrate-mediated electrical stimulation of micropatterned polypyrrole/polyurethane (PPy/PU) composites for enhancing the osteogenesis in osteoblast-like cells. The PPy/PU substrates were obtained by dispersing electrically conductive PPy nanograins within a mechanically resistant PU matrix. Spin-coated PPy/PU