

**Polish-Israeli Conference
on Electrospinning
and Tissue Engineering**

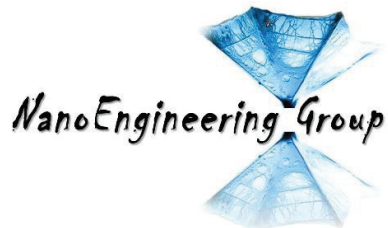
Programme and Abstracts

**04 - 05 October 2018
Warsaw, Poland**

Organizers



Laboratory of Polymers & Biomaterials at Institute of Fundamental Technological Research Polish Academy of Sciences (IPPT PAN) based on the fundamental knowledge in the area of polymer physics, materials science, chemistry and biotechnology, focuses its recent activity on biomaterials for tissue engineering. Great part of our activity is related to polymeric biodegradable scaffolds, mostly formed by electrospinning as nanofibrous structures, both for tissue regeneration and materials for controlled drug release.



Nano Engineering Group at Technion Israel Institute of Technology is focused on research in the field of molecular engineering of soft matter. The particular activities are related to the electrospinning including optimization of the parameters of the process, deep understanding of the fundamental physical facets of electrospinning as well as designing a composite materials for tissue engineering applications.

Objectives

The goal of PICETE conference is to bring together experts from around the world in order to exchange their knowledge, experience and research innovation in the basics of the electrospinning and the broad area of biomedical materials covering topics related to designing, fabrication, characterisation and tissue engineering applications.

The conference will include the following topics:

- Fundamentals of electrospinning
- Optimization of electrospinning
- Properties of electrospun nanofibers
- Functionalization of electrospun nanofibers
- Electrospun nanofibers as scaffolds for tissue engineering/drug delivery systems
- Current trends in designing of polymeric biomaterials for tissue engineering/drug delivery systems

Selected microenvironmental and material factors deciding about scaffold efficiency

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Abstract

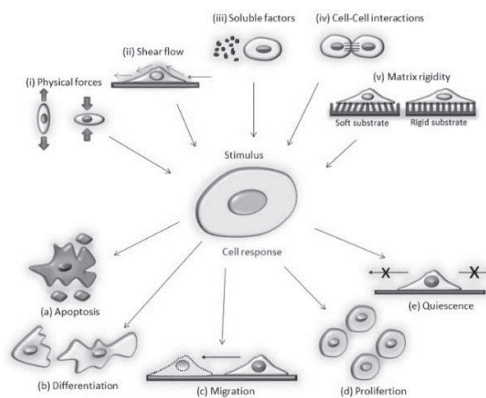
The quality of life of millions of patients has been greatly improved by the development and deployment of permanent implants in the clinical setting such as total knee joint prostheses, cardiovascular stents and breast implants, as well as medical devices including plates, screws and nails, and artificial organs [1-3]. The global regenerative medicine market is expected to reach USD 38.70 Billion by 2021 from USD 13.41 in 2016 [4].

In general, all developed materials needs to be biocompatible, nontoxic, and fulfil properties suitable for specific application. Additionally, scaffold for different tissue regeneration need to fulfil different chemical and mechanical requirements. It is because of differences in microenvironmental stimuli between regenerated tissues types.

The aim of this presentation is to show the literature background as well as selected research done in topic of crucial factors in scaffold development for regenerative medicine.

Main tasks of our group will be presented. Literature about scaffolds requirements dedicated to various tissue types regeneration will be presented. Fundamental research investigations about materials development, structural and surface properties in terms of material-cells interaction will be analysed. The second field of interest are grafts for knee repair (ligaments, bone and cartilage). In this last interest, specific needs e.g.: mechanical, surface, biological properties and degradation conditions are investigated.

Image



A schematic showing the different factors of cells stimuli in vitro [5].

Recent Publications

1. Lysaght, M. J., & Tsui, J. (1999). Observations: Risk, reason, and regulation in contemporary medical devices. *ASAIO journal*, 45(3), 226-228..
2. Jagur-Grodzinski, J. (2006). Polymers for tissue engineering, medical devices, and regenerative medicine. *Concise general review of recent studies. Polymers for advanced technologies*, 17(6), 395-418.
3. Hutmacher, D. W. (2006). Regenerative medicine will impact, but not replace, the medical device industry. *Expert review of medical devices*, 3(4), 409-412.
4. Global Regenerative Medicine Market Analysis & Forecast to 2022; Stem Cells, Tissue Engineering, BioBanking & CAR-T Industries (2018) WiseGuyReports.Com Publish
5. Unal, M., Alapan, Y., Jia, H., et.al. (2014). Micro and nano-scale technologies for cell mechanics. *Nanobiomedicine*, 1(Godište 2014), 1-5.

Biography



Dr Dorota Kolbuk-Konieczny is an alumna of at the Institute of Fundamental Technological Research of the Polish Academy of Sciences (PL), the Socrates-Erasmus Program (ILK, DE), the SCIE X Program (EMPA St. Gallen, CH) and Top 500 Innovators Program (UK).

Her professional research currently focuses on the molecular structure of polymers/biopolymers and tissue engineering, and scaffold development for ligament, cartilage and bone regeneration. Her scientific results have been presented at several international conferences and published in reputable scientific journals.

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