

EINLADUNG

zum Gastvortrag

von

Prof. Wojciech SWIESZKOWSKI, Ph.D. D.Sc. Eng.

Warsaw University of Technology, Warsaw, Poland

am

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Technische Universität Wien, Karlsplatz 13, 1040 Wien
Sem 202 (Stiege 2, 2. Obergeschoß + Halbstock)

A SCAFFOLD-BASED BONE TISSUE ENGINEERING

ABSTRACT:

The number of critical tissues defects caused by injury, cancer or aging of the world population, is increasing. Biodegradable biomaterial natural or synthetic might have broad applications in tissues regeneration. Scaffolds made of them have to support regeneration of the damaged site and then, undergo complete degradation. The degradation rate of those biomaterials must be carefully adjusted to ensure mechanical stability of the scaffold when the new tissue is being formed. Moreover, the biomaterials should give proper micro- and nano-environment for stimulation of a new tissue formation. The aim of the presentation is to show a high potential of using novel 3-dimensional nano and microstructured biomaterials for bone regeneration. Biomaterials such as polycaprolactone, poly(3-hydroxybutyrate-co-3-hydroxyvalerate), polylactide, and their copolymers as well as composites comprised of synthetic polymers and bioceramics and/or natural polymers were studied as a scaffold materials. Solid freeform fabrication and electrospinning have been applied to generate 3D highly porous scaffolds for new tissues formation. The physical, chemical and biological properties of the fabricated constructs were evaluated. It appeared that both, chemical composition of the biomaterials and nano- and microstructure of the scaffolds have significant influence on bone regeneration process.

BRIEF BIOGRAPHY:

Wojciech Świążkowski, Ph.D., Habil., Assoc. Prof. in Materials Design Division, Faculty of Materials Science and Engineering, Warsaw University of Technology, Poland; Expert in the field of biomaterials, including biomaterial synthesis, characterisation and modelling, cell-biomaterial interactions, smart biomaterials for tissue regeneration, drug delivery, advanced design, fabrication and fabrication of scaffolds; Biomaterials Group leader (7 post doctorate and 12 PhD students); Leader and project manager of the 4 national grants and 4 EC FP6 grants, 3 COST Actions; 2 Era-Net projects; Coordinator of the Polish- Japan PhD study in Materials Science, Coordinator of the Polish-Singapore project in tissue engineering, author of about 100 publications, 6 book chapters and 5 patents, over 300 citations.