ETH zürich

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chairman: Prof. Dr. Rudi Gunawan

BIOACTIVE MATERIALS AND BIOFABRICATION FOR TISSUE ENGINEERING: PROGRESS AND CHALLENGES

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ETH Hönggerberg, 10/02/2016
HCI J 3, 17.00 h
The Seminar will be followed by an Apéro

Abstract. The development of 3D multifunctional bioactive scaffolds for tissue engineering and regenerative medicine will be discussed, summarising recent progress and remaining challenges. A comprehensive overview about 3D scaffolds will be presented and key results focusing on the development of (nanostructured) bioactive glass and polymer-bioactive glass composite scaffolds will be discussed. Novel approaches involving the coating and infiltration of bioactive scaffolds by biodegradable polymers containing functionalized nanoscale particles or nanofibres for in-situ drug delivery will be introduced, as an attractive concept to merge tissue engineering and drug delivery approaches. To highlight the important advantage of bioactive glasses in comparison with other biomaterials, we will discuss how specific glass compositions doped with bioinorganics (metallic ions with therapeutic effects) can induce favourable cell behaviour in relation to osteogenesis and angiogenesis. In this context, the vascularisation potential of a new family of bioactive scaffolds incorporating biologically active ions will be discussed and the current challenge in the field, e.g. the development of vascularised tissues, will be demonstrated based on recent in vivo results.

Speaker highlights. Prof. Aldo R. Boccaccini has held the Chair for Biomaterials at the Department of Materials Science and Engineering, University of Erlangen-Nuremberg, Germany, since 2009. Previously he was Professor of Materials Science and Engineering at Imperial College London, UK, where he is currently Visiting Professor. The research activities of A. R. Boccaccini are in the broad area of glasses, ceramics and composites for biomedical applications with emphasis on processing and characterisation of bioactive, nanostructured scaffold materials for tissue engineering. He is the author or co-author of more than 600 scientific papers and 15 book chapters. Boccaccini has been a visiting professor at different universities around the world, and he has been a frequent invited and keynote speaker in numerous international conferences. He is member of the editorial board of more than 10 international scientific journals and a member of the international advisory committee of the Ministry of Science and Technology of Argentina. His achievements have been recognised by numerous international awards.