University of Zurich[UZH]

Institute for Regenerative Medicine (IREM)

Colloquium

Clinical Colloquium Regenerative Medicine

Thursday, 27th June 2019 at 1–2pm,
Institute for Regenerative Medicine (IREM),
University of Zurich, Wagistrasse 12,
WAD-904 (Founders Lab), 8952 Schlieren

Prof. Dr. Ralph Müller

Institute for Biomechanics, ETH Zurich

3D Bioprinting of Personalized Human Bone Organoids

To advance the development of cell- and biomaterial-based therapeutics to treat bone diseases, it is imperative to create bone organoids that closely mimic the structural and biological complexity of human bone tissue. Models should provide a better understanding of the molecular mechanism and the evaluation of the structural changes in bone that occur during the remodeling process. 3D bioprinting is an attractive approach to overcome unstructured scaffolds geometries, or the lack of control on cell and matrix organization used in conventional tissue engineering. Moreover, given the high automation and reproducibility, 3D bioprinting offers a promising tool not only to generate engineered bone tissues for bone replacement but also to create reproducible test beds for drug or implant development. One of the main challenges in 3D bioprinting of human bone organoids is the choice of cell and material sources for cell-laden bioprinting. Inks must provide high fidelity for scaffold geometry while assuring high cell viability and the formation of a mineralized extracellular matrix. Efforts have already been made on the development of bioinks for advanced 3D bioprinting of bone. This presentation will provide an overview of the activities currently under way at the Institute for Biomechanics to create personalized human bone organoids using human cell sources, advanced biomaterials and patient-specific bioprinting.

Organiser: Prof. Dr. Dr. Simon P. Hoerstrup / Prof. Dr. Roger M. Nitsch
Execution/Chair: Dr. Steffen M. Zeisberger / Dr. Christian Tackenberg
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