



University  
of Basel

Department of  
Biomedical Engineering



Selected research topics in Biomedical Engineering:

The Future of Personalized Medicine: 3D Printing and Patient-Specific Technologies

Location: Biozentrum, Spitalstrass 41, Basel, Seminar Room U1.191

Date & Time: Tuesday 26.03.2024 11:15 – 13:00

# Controlling multicellular organization by hydrodynamic waves

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## Abstract

The application of extrinsic fields is revolutionizing the control and replication of structural complexity in multicellular systems. Recent trends emphasize the effectiveness of acoustic, magnetic, electric, hydrodynamic, and optical fields as gentle, contactless strategies for organizing cells, materials, and biochemical factors to foster morphogenesis and tissue generation. In our laboratory, we have pioneered hydrodynamic wave-based approaches that enable the biofabrication of reproducible, spatially organized multicellular systems. We have utilized these techniques to bioassemble living systems for localized bone mineral deposition in 3D and in creating microcapillary networks for tumor models to test novel anti-cancer treatments. Furthermore, we have utilized hydrodynamic waves to develop a multi-organ model to study innervation in diseased tissues.

## Biosketch

Tiziano Serra is Focus Area Leader at AO Research Institute Davos, Switzerland, and Assistant Professor at MERLN Institute (Maastricht University, NL). He holds an MSc in Materials Science and Engineering from the University of Salento (IT), earned his Ph.D. in 3D printing for tissue engineering from the Institute for Bioengineering of Catalonia (ES), and was a postdoctoral fellow at University College London (UK). He was the recipient of the ISBF Young Investigator Award from the International Society of Biofabrication and Julia Polak European Doctoral Award from European Society of Biomaterials. Dr Serra is the inventor of the Sound Induced Morphogenesis (SIM) technology, licensed to mimiX Biotherapeutics, a successful Swiss start-up that he co-founded and served as Chief Scientific Officer till 2022.