

**ICB seminar series 2017/18**

chairman: Prof. Dr. Andrew deMello

# DIGITAL MANUFACTURING OF MICROFLUIDIC DEVICES

**Prof. Dr. Albert Folch**Department of Bioengineering,  
University of Washington, Seattle**ETH Hönggerberg, Friday, 04/05/2018****HCI J 6, 15.00 h**

The Seminar will be followed by an Apéro



**Abstract:** Digital Manufacturing (DM) has been applied with great success to improve design efficiency and part performance in various industries. However, by comparison with other manufacturing fields, microfluidics has been slow to adopt DM. Microfluidic chips are still designed largely from scratch. The production of microfluidic devices by micromolding, while being optimized for mass manufacturing, cannot be optimized at the same time for design variety. These limitations are difficult for researchers to assimilate because micromolding has been the prevalent mode of microfluidics manufacturing for over two decades. On the other hand, the economics of DM are well-suited for microfluidics because, as opposed to molding approaches, the cost per device does not scale up with its 3D complexity and is insensitive to the size of the production batch. We are developing microfluidic devices through stereolithography (SL), a form of 3D-Printing, in order to democratize the access of biomedical scientists to microfluidics. We have developed microfluidic devices by SL in PEG-DA-based resins with automation and biocompatibility ratings similar to those made with PDMS.

**CV:** Albert Folch received his BSc in physics from the University of Barcelona (UB) in 1989 and his PhD in surface science and nanotechnology from the same university in 1994. During his PhD he was a visiting scientist at the Lawrence Berkeley Lab working on AFM under Dr. Miquel Salmeron. From 1994–1996, he was a postdoc at MIT developing MEMS under the advice of Martin Schmidt (EECS) and Mark Wrigton (Chemistry). In 1997, he joined the laboratory of Mehmet Toner as a postdoc at Harvard's Center for Engineering in Medicine to apply soft lithographic methods to tissue engineering. He has been at Seattle's UW BioE since June 2000 where he is now a full Professor. His lab works at the interface between microfluidics, cancer and neurobiology.