ETH zürich

ICB seminar series 2015/16
chairman: Prof. Dr. Rudi Gunawan

ADVANTAGES OF GOING SMALL: CHEMISTRY, NANOTECHNOLOGY, AND BIOLOGY APPLICATIONS

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ETH Hönggerberg, 30/03/2016
HCI J 3, 17.00 h
The Seminar will be followed by an Apéro

Abstract. Miniaturization is transforming laboratory procedures into integrated systems capable of providing new understanding of fundamental chemical and biological processes as well as rapid, continuous discovery and development of new products. Integration of continuous and droplet based reaction components with analytics, sensors, actuators, and automated fluid handling enables automated optimization along with techniques for deriving mechanistic and kinetic insight while using small amounts of material. Case studies include multistep and multiphase chemical syntheses relevant pharmaceuticals and nanostructures. Surface tension based extraction units integrated with small-scale continuous reactors enable multistep processes to enable reconfigurable, mobile, production platforms. Cellular manipulation applications focus on microfluidic cell squeezing devices for delivery of macromolecules and nanoparticles across the cell membrane to the cytosol.

Speaker highlights. Klavs F. Jensen is Warren K. Lewis Professor in Chemical Engineering and Materials Science and Engineering at the Massachusetts Institute of Technology. From 2007 - July 2015 he was the Head of the Department of Chemical Engineering. His research interests revolve around reaction and separation techniques for on-demand multistep synthesis, as well as microsystems biological discovery and manipulation. Catalysis, chemical kinetics and transport phenomena are also topics of interest along with development of simulation approaches for reactive chemical and biological systems. He chairs the Editorial Board for the new Royal Society of Chemistry Journal Reaction Chemistry and Engineering. He is a member of the US National Academy of Engineering and the American Academy of Arts and Science. He is a Fellow of the American Association for the Advancement of Science, the American Chemical Society, the American Institute of Chemical Engineers, and the Royal Society of Chemistry.