



Singapore-MIT Alliance for Research and Technology



Focused Seminar Series on Micro-devices in Biological Studies

25 Jul — 10 Oct 2016 @ UTown, S'138602

Seminar 3: Microfluidic Particle Factories

Professor Patrick Doyle

Massachusetts Institute of Technology

<http://doylegroup.mit.edu>

Date: 15 Aug 2016, Monday

Time: 4pm to 5pm

Venue: CREATE Theatrette, Level 2 of CREATE Tower @ UTown, S'138602



Abstract

In this talk I will describe how microfluidic technologies can be used to synthesize new functional materials. I will begin by introducing a new way of interfacing lithography and microfluidics to “optically stamp” complex and functional microparticles. This technique takes advantage of the unique ability to finely structure flows and chemical gradients in microfluidic devices. Next, I will describe a few demonstrative examples of uses of the complex particles that range from bioassays to anti-counterfeiting to artificial cells. All of these examples require the large-scale production of non-spherical and chemically complex microparticles.

Biography

Patrick Doyle is the Robert T. Haslam and Singapore Research Professor of Chemical Engineering at the Massachusetts Institute of Technology. His research focuses on fundamental and applied topics in soft matter. Much of his research is in the realms of micro/nanofluidic technologies, DNA biophysics, biosensing and rheology. A burgeoning interest is the use of microfluidics to synthesize microparticles for both fundamental colloidal studies and applications, such as multiplexed sensing, biomimetic systems and anti-counterfeiting. He obtained his B.S. degree from the University of Pennsylvania in 1992, and his Ph.D. from Stanford University in 1997. After postdoctoral work with Jean-Louis Viovy at the Institute Curie in Paris, he joined the Chemical Engineering Department at MIT in 2000. Among his honors are the NSF-Career Award (2003), Lab on a Chip/ Corning Inc. Pioneers of Miniaturization Prize (2008), John Simon Guggenheim Fellowship (2009), and the RSC Soft Matter Lectureship (2012).