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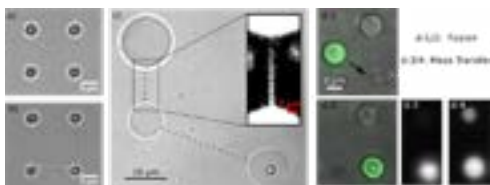
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### Manipulation of biomimetic soft interfaces by optical and microfluidic methods

The design and manufacturing of functional soft structures, based on multiple compartments delimited and interconnected by lipid-stabilised or surfactant-stabilised interfaces, are attracting an increasing level of attention. These soft constructs have shown a great potential as minimal cells in synthetic biology, simplified model systems for biophysical and biochemical studies and smart containers for drug delivery and microreactor technologies. In recent years, microfluidic and optical methods for the manipulation of such soft interfaces have provided a substantial contribution to the design and development of novel artificial systems exhibiting interesting cell-like behaviours and functions. In this

talk, I will present a number of optical and microfluidic techniques, we developed for the construction and characterisation of artificial soft structures, including droplet interface bilayer architectures and soft nanotube networks. More specifically, I will discuss how accurate flow and particle handling operations within a microfluidic environment can be used to build artificial model systems from soft interfaces, such as lipid bilayer membranes and surfactant-stabilised oil-water interfaces. The resulting architectures can display biochemical and structural properties and functionalities, similar to those seen in living cell systems.



Soft nanofluidic networks consisting of oil droplets connected by surfactant-stabilised oil nanotubes.

#### Biography

Guido Bolognesi obtained an international joint PhD in “Theoretical and Applied Mechanics” in 2012 at the University of Rome “La Sapienza” and University Claude Bernard Lyon 1 (UCBL). In 2011, he joined the Membrane Biophysics Group in the Department of Chemistry at Imperial College London as a post-doctoral research associate and in 2016 he became lecturer in Bio-engineering in the Department of Chemical Engineering at Loughborough University. His research interests lie in the experimental investigation of the physico-chemical behaviour of soft matter (such as colloids, lipid membranes) and fluid flows at the micrometer length scale with an interdisciplinary approach based on expertise in mechanics, micro-/nano-fluidics, microfabrication techniques, optics, interface and colloid science

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