



Dr Joe Tavecchi

NMP-06-2015:

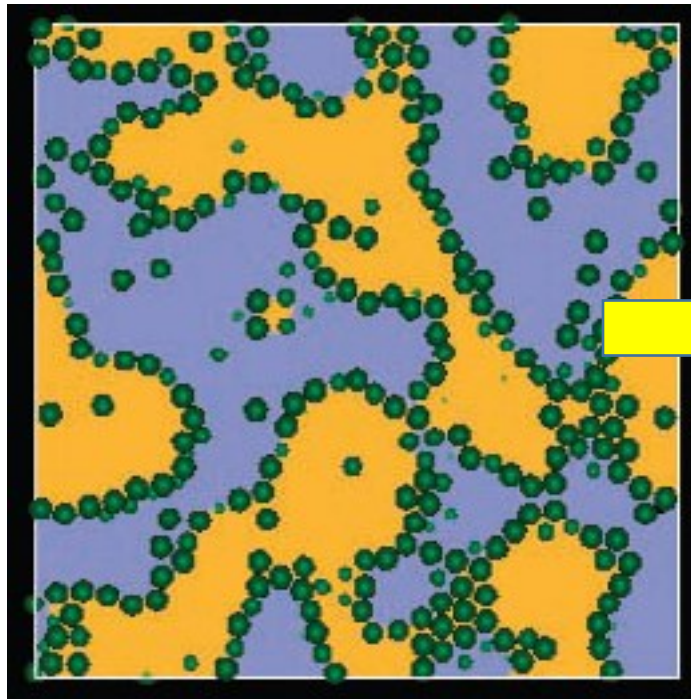
Novel nanomatrices and nanocapsules



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Bicontinuous Interfacially Jammed Emulsion Gel

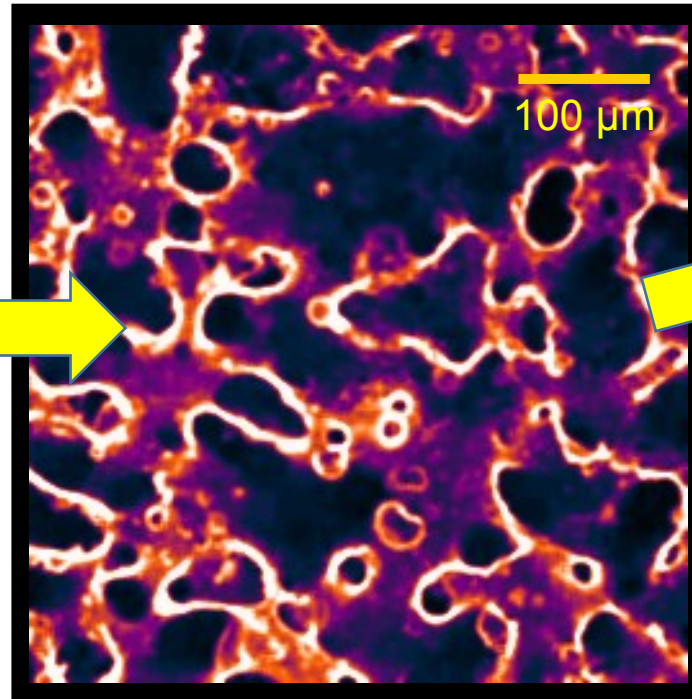
2 liquid domains stabilised by adsorbed particles. domains tortuous and entwined



SIMULATION

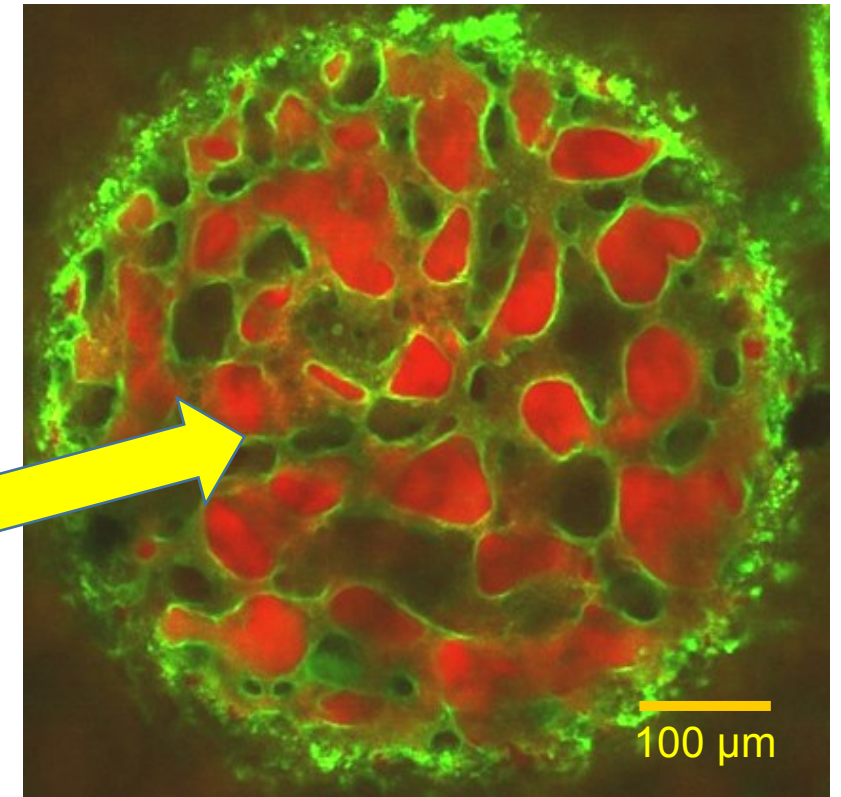
K. Stratford *et al.* Science **309**, 2198 (2005)

The first bijel: water, lutidine and FITC dyed silica



EXPERIMENT

Herzig *et al.* Nature Materials **6**, 966 (2007)



Bijel Capsules: The first capsules to hold two continuous networks stabilised by particles

Internal scale: sub micron to 100s of microns

External scale: 10 to 100s of microns

Prime for application.....

Bijels and Bijel Capsules Advantages

Eliminate surfactants and polymers from emulsion system while keeping fluid phase continuous

Stabilize non-equilibrium mixture without the use of surfactants and polymers

Release hydrophilic and hydrophobic ingredients material (drugs, antimicrobial vitamins) simultaneously from a single material under equal treatment conditions.

Release two components in a symmetric ratio from a single material

Triggered reaction

Easy spreading without stickiness

Dual function stabilizer (can be an active ingredient: TiO₂, ZAG)

Track Record

First involvement in H2020

Soft matter scientist focused on developing novel materials and capsules:

Developed Bijel Capsules

Worked on bringing the bijel from concept to application
(Scottish Enterprise)



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Web Pages

<http://www2.ph.ed.ac.uk/~jtavaco2/>

<http://www.edinburghcomplexfluids.com/>

<http://www2.ph.ed.ac.uk/cmater/new-soft-materials>

<http://www.lamellar.com/index.html>