ZERNIKE INSTITUTE COLLOQUIUM

Thursday, October 1st, 2015

15:00h, Lecture Hall: 5111.0080 **Coffee and cakes from 14:30h**

Towards synthetic cellularity via protocell design and construction

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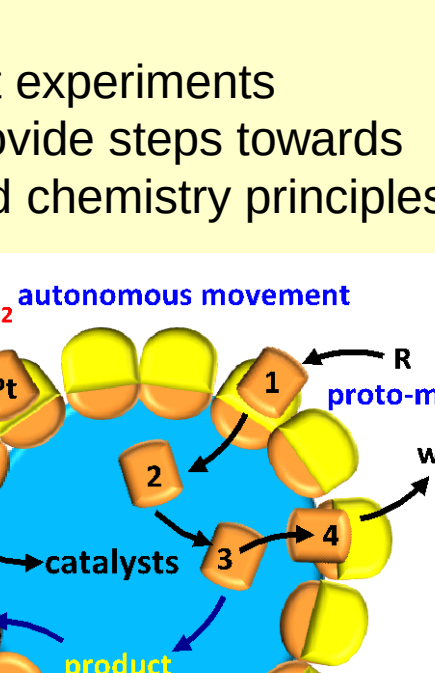
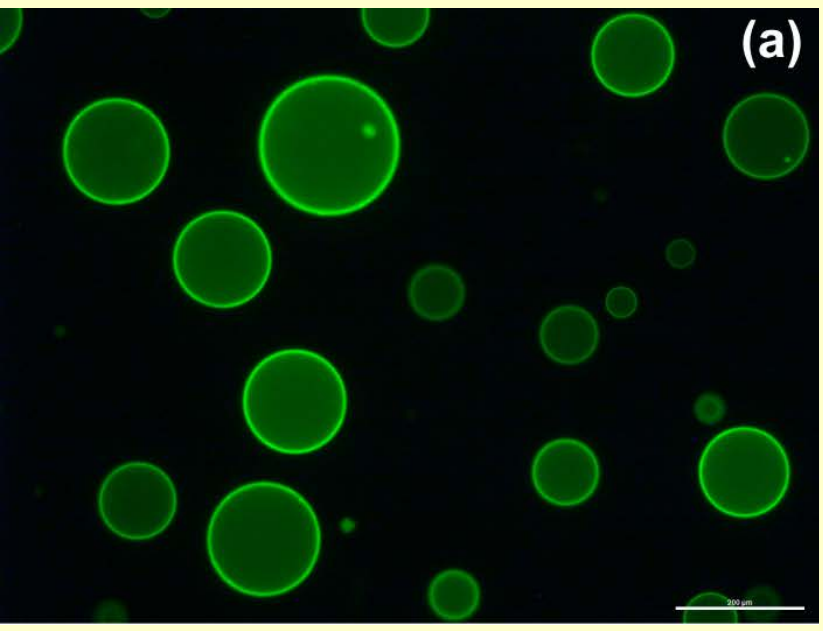




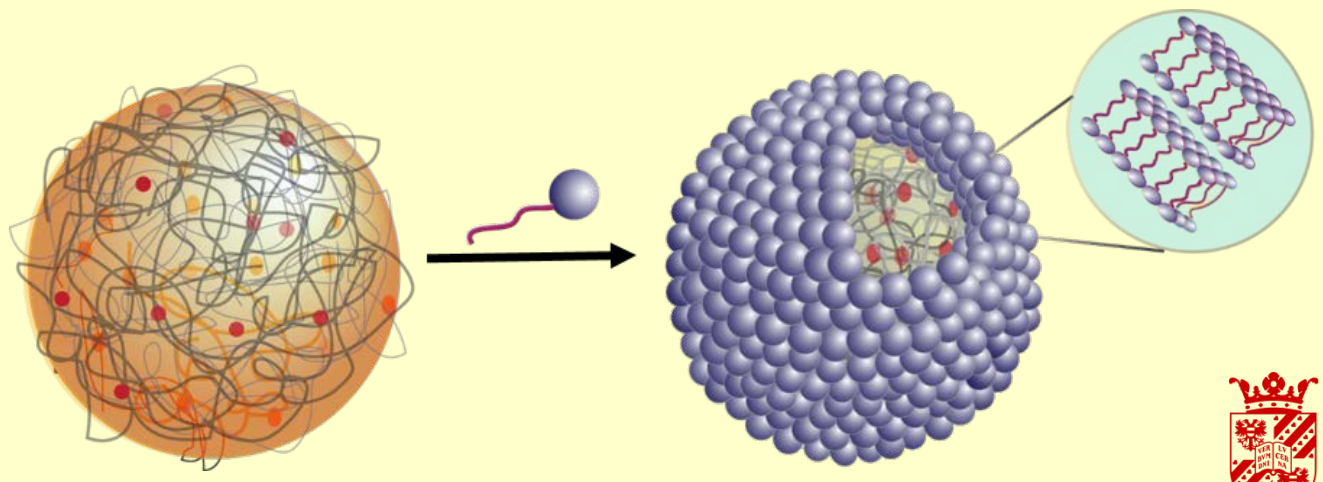
The design and construction of compartmentalized chemical ensembles for modelling complex biological systems, exploring the origin of life, and advancing future living technologies is attracting considerable interest in a wide range of research communities.

In this talk, I will review some recent experiments undertaken in my laboratory that provide steps towards synthetic cellularity using bioinspired chemistry principles and techniques.

Functional nanoparticle self-assembly
Multi-length scale porosities

I will discuss four new protocell models based on;
(i) nanoparticle self-assembly (colloidosomes) [1],
(ii) interfacial assembly of protein-polymer nanoconjugates (proteinosomes) [2],
(i) micro-droplet formation (coacervation) [3], and hybrids of the above [4].

I will use these new model systems to discuss pathways towards chemical cognition, modulated reactivity and basic cellularity in compartmentalized artificial micro-ensembles.



References:

[1] Li M et al., *Membrane-gated permeability in self-activated inorganic protocells.* Nature Chem., **5,** 529-536 (2013).

[2] Huang X, et al., *Interfacial assembly of protein-polymer nano-conjugates into stimulus-responsive biomimetic protocells.* Nature Commun. **4**, 2239 (2013) DOI: 10.1038/ncomms 3239, 1-9 (2013).

[3] Koga, S., et al., *Peptide–nucleotide microdroplets as a step towards a membrane-free protocell model.* Nature Chem. **3,** 720-724 (2011).

[4] Tang T-Y D, et al., *Fatty acid membrane assembly on coacervate micro-droplets as a step towards a hybrid protocell model*. Nature Chem. **6**, 527- 533 (2014).

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