

## Protocells and Surface-adhered Biomembrane Networks

*Thursday, 24 November 2022 18:15 (15 minutes)*

Reservoirs of lipid molecules, specifically onion shell vesicles, spread on high energy surfaces, e.g. SiO<sub>2</sub>, to form a stack of molecular films (double bilayer). Eventually, the spreading lipid exhausts the reservoir, and rising tension ruptures the films. Köksal et al. discovered that this disruptive process generates a network of nanotubes, which redistributes lipid material in order to alleviate local tension (Marangoni flow), and vesicles grow from the tubes. We have shown that local heating accelerates the growth and transformation of containers, and initiates their fusion. Similar processes might have occurred in warm environments on the Early Earth. Our current work aims to utilize this system and control soft matter transformations with IR light to design and construct reconfigurable chemical reaction networks (CRNs) on engineered surfaces

### Topics

### Contact Email address

r.ryskulov.valkommen@gmail.com

**Primary authors:** Mr RYSKULOV, Ruslan (Chalmers University of Technology); Dr PEDRUEZA, Esteban (Department of Chemistry and Chemical Engineering, Chalmers University of Technology); Dr KÖKSAL, Elif (Centre for Molecular Medicine Norway, Faculty of Medicine, University of Oslo); Dr SPUSTOVA, Karolina (Centre for Molecular Medicine Norway, Faculty of Medicine, University of Oslo); Mr XUE, Lin (Centre for Molecular Medicine Norway, Faculty of Medicine, University of Oslo); Prof. GÖZEN, İrep (Centre for Molecular Medicine Norway, Faculty of Medicine, University of Oslo); Prof. JESORKA, Aldo (Department of Chemistry and Chemical Engineering, Chalmers University of Technology)

**Presenter:** Mr RYSKULOV, Ruslan (Chalmers University of Technology)

**Session Classification:** Biophotonics and sensor technologies