From Membranes and Vesicles to Synthetic Cells

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The spatial architecture of biological cells is based, to a large extent, on fluid membranes that partition space into separate compartments. These compartments are flexible and can be remodeled with respect to their morphology and composition. Examples are provided by tubulation, budding, engulfment of nanoparticles, and membrane wetting by protein-rich droplets. The latter example is intimately related to the recent discovery that cells also contain membrane-less organelles that behave like liquid droplets. Both types of fluid compartments provide useful modules for a bottom-up approach to synthetic biology. The talk will end with a brief outlook on this emerging research field.