

第一回発動分子科学セミナー

Artificial Cells and Cellular Bionics

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This talk will outline novel microfluidic strategies for biomembrane engineering that are capable of fabricating vesicles, multisomes and artificial /cells tissues on demand. These platforms are being used to construct complex multi-compartment artificial cells where the contents and connectivity of each compartment can be controlled. These compartments are separated by biological functional membranes that can facilitate transport between the compartments themselves and between the compartments and external environment. These technologies have enabled us to engineer multi-step enzymatic signalling cascades into the cells leading to *in-situ* chemical synthesis and systems that are capable of sensing and responding to their environment. The talk will also highlight recent work in our group in the field of cellular bionics where we are manufacturing artificial cell-real cell hybrid systems where the combined ensemble performs user defined functions. Alongside this, the talk will outline the development of novel droplet based artificial tissues that can be used to generate display materials based on biological components.

Aromatic foldamers: mastering molecular shapes

Professor Ivan Huc

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Aromatic amide oligomers constitute a distinct and promising class of synthetic foldamers – oligomers that adopt stable folded conformations. Single helical structures are predictable and constitute convenient building blocks to elaborate synthetic, protein-sized folded architectures. They possess a high propensity to assemble into double, triple and quadruple helices, or to form sheet-like structures. Cavities can be designed that enable them to act as artificial receptors and molecular motors. These foldamers also show promise in nucleic acid and protein recognition. This lecture will give an overview of the design principles of these functional molecular architectures and highlight recent developments.