



Plenary 20

## From Molecules to Bio-inspired Molecular Systems

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In our body a fascinating collection of ingenious catalysts, molecular motors and machines make it possible that our cells divide, that we can use our muscles and that the consumption of ATP can be used to generate force and mobility. Multiple integrated catalytic cycles, molecular information storage and retrieval, triggering and signal transduction, transport and repair mechanisms are among the challenges ahead in the design of artificial systems featuring cell like behavior. Chemical systems ultimately require control over structure, organization and function of multi-component molecular assemblies at different hierarchical levels. Major challenges are the design of kinetic driven processes and control over translational and rotary motion.

In this presentation efforts to develop synthetic systems where several structures and functions are integrated will be discussed. Taking inspiration from nature the focus is on control of the dynamics of complex molecular systems and assembly processes. In particular we design molecular systems such as switches and motors in which the control of molecular dynamics is coupled to specific functions. Progress and prospects on dynamic molecular systems will be discussed.