Supramolecular chemistry

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Summary
The course provides an introduction to supramolecular chemistry. In addition, current trends are discussed using recent publications in this area.

Content
• Introduction
• Basics
• Receptors for cations
• Receptors for anions
• Receptors for neural molecules
• Supramolecular coordination chemistry
• Catenanes, rotaxanes and knots
• Molecular machines
• Supramolecular catalysis
• Self-replicating molecules
• Molecular imprinting
• Dynamic combinatorial libraries
• Foldamers

Learning Outcomes
By the end of the course, the student must be able to:
• Recall the most important non-covalent interactions.
• Recall analytical techniques for the analysis of host-guest systems.
• Assess / Evaluate the thermodynamic driving force for the formation of self-assembled systems.
• Recall the most important classes of receptors for anions, cations, and neutral molecules.
• Recall the design principles for the construction of metallasupramolecular aggregates.
• Differentiate rotaxanes, pseudorotaxanes, catenenaes and molecular knots and machines, and recall synthetic routes to make these compounds
• Recall attempts for the bottom-up construction of molecular machines.
• Describe the basic concepts of self-replicating molecules, molecular imprinting, foldamers, and selection experiments with dynamic combinatorial libraries.

Expected student activities
Summarize and discuss a recently published research article in the area of supramolecular chemistry in form of a Powerpoint presentation.

Assessment methods
Written exam during the course (50%)
Oral presentation during the course (50%)

Resources
Ressources en bibliothèque
• Supramolecular Chemistry / Steed
• Principles and Methods in Supramolecular Chemistry / Schneider

Websites
• http://scgc.epfl.ch/telechargement_cours_chimie