Editorial

NCCR
Molecular Systems
Engineering

Thomas Ward

The National Center of Competence in Research (NCCR) Molecular Systems Engineering was launched in July 2014 and is generously supported by the Swiss National Science Foundation, the University of Basel and the ETH Zürich. The project, spearheaded by Proffs. W. Meier and T. Ward (University of Basel) and by Prof. D. Müller (ETH Zürich in Basel) currently includes twenty-seven groups from seven institutions.

The long-term effort of this ambitious project aims to combine the expertize of various disciplines including chemistry, biology, physics, engineering and bioinformatics to predictably design, assemble and valorize molecular systems of increasing complexity.

A molecular system is constructed from various molecular modules of chemical- or biological origin. As a result of the interactions between the different modules, a molecular system typically displays emergent properties, which exceed the sum of the properties of the isolated molecular modules. Each module can be viewed as a chemical- or biological prosthesis that is engineered and integrated within a system to improve its performance or to endow it with a new function.

Daniel Müller

The Molecular Systems Engineering project is subdivided into four workpackages. Following a bottom-up strategy, tailored molecular modules (workpackage 1) are assembled into molecular systems (workpackage 2). Building upon the acquired knowledge, molecular systems are combined to create molecular factories *in vitro* for the production of high-added value products (workpackage 3). Alternatively, molecular modules are integrated within living systems to diagnose, control health or cure a disease (workpackage 4).

This issue of CHIMIA outlines the long-term goals of the Molecular Systems Engineering that result from combining the individual expertize of the groups involved in this exciting NCCR.

We wish to express our deepest gratitude to Prof. Wolfgang Meier who recently stepped down from the position of director of this NCCR for private reasons. Professor Meier was the initiator and catalyst of the Molecular Systems Engineering project. He will continue to serve as a workpackage leader and we are delighted to be able to count on his scientific wisdom and creativity in the future.

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It is with great pleasure that the Editorial Board of CHIMIA thanks the guest editors Prof. Dr. Thomas Ward and Prof. Dr. Daniel Müller for the successful realization of this special issue on NCCR Molecular Systems Engineering; illustrating the great value and potential of interdisciplinary science.