

Editorial



Dr. Thomas Vorherr



Prof. Dr. Jean-Louis Reymond

Dear Readers

This special issue brings an update to the state of academic and industrial peptide chemistry research in Switzerland following on the December 2013 special issue on the same topic (<https://www.ingentaconnect.com/content/scs/chimia/2013/00000067/00000012>). We hope that you will enjoy reading. We would like to thank all the groups who contributed and helped to provide a good snapshot of peptide research in Switzerland. A brief summary of the content is presented below.

The success of peptide chemistry stems primarily from progress in solid-phase peptide technologies (SPPS). As exemplified by **Ralph Schönleber** at Bachem, these methods are well established at the industrial scale in Switzerland, but also continue to undergo development such as flow synthesis for direct SPPS of long peptides and proteins, an approach pursued by **Nina Hartrampf** at the University of Zurich. Protein chemical synthesis now becomes more feasible by combining SPPS with native chemical ligation as applied by **Beat Fierz** at EPFL to investigate post-translational modifications in epigenetics.

Many peptides originate from important bioactive molecules such as hormones and chemokines from which drugs can be developed, for example targeting GPCR peptide ligands as presented by **Oliver Hartley** at the University of Geneva. Phage display represents a method to discover and develop peptide drugs as applied at the University of Basel by **Daniel Ricklin**. Radiolabeling for diagnostic or cancer therapy as outlined by **Melpomeni Fani** at the University Hospital in Basel, and NMR of isotope labeled peptides to determine their structure and mode of target interaction as discussed by **Oliver Zerbe** at the University of Zurich broaden the scope of applications.

Several groups are addressing the issue of making peptides more stable and bioavailable, often as macrocyclic ligands as is the case for the drugs developed by **Daniel Obrecht** at Polyphor or the innovative approaches taken by **Christian Heinis** at EPFL. A better understanding of peptide permeability is approached computationally by **Sereina Riniker** at ETHZ, and key features to improve cellular uptake and to control metabolism are investigated by **Thomas Vorherr** at Novartis.

Progress in methods and availability of building blocks plus reagents encourage the design of new molecules as **Helma Wennemers** at ETHZ has shown by designing functionalized proline helices and collagen analogs for catalysts, chemical biology and supramolecular chemistry. Similarly, **Michal Shoshan** at the University of Zurich aims to develop metal-binding peptide drugs by using coordinating non-natural residues. **Jean-Louis Reymond** at the University of Bern has in addition considerably contributed to cheminformatics know-how and investigates peptide dendrimers as antibacterial and transfection reagents. **Marc Mathieu** and **Origène Nyanguile** at HES-SO Valais use SPPS to develop a broad discovery program aiming at regioselective antibody labeling reagents, antivirals, antibacterial and drug targeting peptides.

Finally, one should not forget that peptides are primarily natural products, and thus, represent a rich source of novel structures with unique modes of action. The work by **Jörn Piel** at ETHZ, who reports on ribosomally synthesized and post-translationally modified peptides (RiPPs) demonstrates this potential to arrive at a new class of natural products from bacteria.

Thomas Vorherr
Novartis Pharma AG

Jean-Louis Reymond
Department of Chemistry,
Biochemistry and Pharmaceutical Sciences
University of Bern

The Editorial Board of CHIMIA warmly thanks the guest editors Dr. Thomas Vorherr and Prof. Dr. Jean-Louis Reymond for the successful realisation of this fascinating update on Peptide Chemistry in Switzerland.

The cover image shows the interaction between Cp40 (light grey), a peptidic complement inhibitor of the compstatin family, with its target protein, the complement opsonin C3b (teal). A Cp40-based drug candidate is currently in clinical development by Amyndas Pharmaceuticals for various inflammatory disorders. The image was prepared by Dr. Daniel Ricklin (University of Basel) using PyMOL and structural data (PDBID 7BAG) obtained by Drs. Piet Gros and Xiaoguang Xue (Utrecht University) and Dr. John D. Lambris (University of Pennsylvania).