Editorial

Peptide Science in Switzerland – A Revival

Jeffrey Bode

Peptides are everywhere! And Switzerland is a leading place for their development, production, and application. At every Swiss University, at Swiss companies large and small, everywhere exciting research with peptides is ongoing.

We are delighted to bring you this compilation of cutting-edge peptide research in Switzerland. It is remarkable not only for the sheer volume of peptide science but also for the breadth and quality. The diversity of the contributions ranges from synthesis and bioactivity to materials, cell penetration, metal complexes and electron transfer. This makes it hard to identify any one common theme, so we instead celebrate the versatility of creative research in peptide chemistry.

Helma Wennemers

Although solid-phase peptide synthesis is now a well-established and widely used method for preparing peptides, all practitioners are well aware of both its advantages and its limitation. *Fritz Dick* and his team at Bachem illustrate the incredible ability of modern methods to prepare kilogram quantities of pure peptides, along with excellent tales of many of the problems encountered. Creative new methods for peptide synthesis, for example the photochemical peptide synthesis described by *Christian Bochet*, are therefore always important. The important role of peptide building blocks in natural product synthesis is highlighted in *Jieping Zhu*'s contribution.

The structural diversity of peptides and the ability to prepare many sequences have long made them ideal platforms for biologically active compounds, an area that is as hot today as it was 30 years ago. A powerful approach to PNA-encoded libraries for rapidly finding biologically active hits is presented by *Nicholas Wissinger*. *Christian Heinis* combines phage display with innovative cross-linking agents to prepare and screen thousands of bi- and tricyclic peptides. *John Robinson* describes his impressive research on designed β-hairpin peptides as inhibitors of protein–protein or protein–RNA interactions. *Katharina Fromm* showcases the value of peptide–silver complexes as antimicrobial agents. The value of extending peptide topology from linear to dendritic is shown by *Jean-Louis Reymond*. And *Thomas Vorherr* shares reflections on the extremely important but poorly understood phenomena of cell permeability of certain peptides. *Gisbert Schneider* moves peptide chemistry into the computer, where he can design and adapt biologically active peptides.

Peptides are also outstanding platforms for the development of synthetic materials as described by *Wolfgang Meier* in his report on self-assembled structures formed from designed amphiphilic peptides. *Helma Wennemers* details the fundamental insight gained on the molecular factors that are responsible for the stability of collagen and pave the way for the development of functional synthetic collagen. Fundamental understanding of electron transfer through proteins was gained by *Bernd Giese* by cleverly functionalized rigid peptides.

Finally, *Dieter Seebach* and *Manfred Mutter* look back on the wealth of exciting results that came out of their laboratories over the past decades – two 'must reads' from two pioneers of peptide science in Switzerland.

Perhaps the most amazing aspect of editing this issue is the fact that these contributions are not even a comprehensive collection of peptide chemistry in Switzerland. There are more academic groups – and many more companies – all working towards new applications and new advances in peptide science. Peptides are back, and seemingly here to stay.

We thank all of the colleagues who made this special issue possible and wish you joyful reading on peptide science.

Jeffrey Bode and Helma Wennemers
Laboratorium für Organische Chemie
ETH Zürich
CH-8093 Zürich, Switzerland