

Editorial



This is the third collection of articles from *Young Professors and Ambizione Fellows in Switzerland* that I have had the pleasure to present during my time as Editor of *CHIMIA*. The contributors to these themed issues are embarking on their independent academic careers and the cover of this issue of *CHIMIA* represents the emergence of new scientific prowess in Switzerland. Eleven Assistant Professors and Ambizione Fellows accepted my invitation to present their research topics. The diversity of themes in this issue underlines the wealth of chemical avenues being explored within Swiss institutions by our young colleagues.

Ricardo J. Fernández-Terán introduces us to the use of ultrafast multidimensional spectroscopic techniques (in particular 2D-infrared spectroscopy) to investigate the study of electron transfer, proton transfer and proton-coupled electron transfer reactions. The development of fluorescent biosensors is central to research in the group headed by **Michelle S. Frei**; she discusses protein-labelling approaches applied in chemigenetic biosensor design and also looks at biosensor design principles and applications. In her review, **Nathalie M. Grob** explores how non-canonical amino acids are integrated into peptide discovery platforms and discusses how this approach is critical to the development of future generations of peptide therapeutics.

Yang Yao describes how nanoscale confinement influences the behaviour of soft matter compared to behaviour in bulk materials. Two modes of confinement are addressed: soft confinement in lipidic mesophases and hard confinement in inorganic nanopores; an important challenge is how to apply confinement to code function into soft matter. Research from the team led by **Sonja Schmid** focuses on how biomolecules move and interact at the nanoscale; her review details the use of electrically-detected nanopore recordings and single-molecule Förster Resonance Energy Transfer (smFRET) measurements to provide insight into biomolecular dynamics. The development of chemically programmed microrobots is described by **Minghan Hu** who illustrates the progression from single- to multi-responsive microrobots, with a goal of achieving systems that may function as independent agents in biomedical, technological and other fields.

Dating of heritage materials is at the heart of **Laura Hendriks'** research, and (along with her coworkers) she introduces the technique of compound specific carbon isotope analysis; this approach targets molecular species present in dyes and pigments, and facilitates the absolute dating and determination of provenance of an artifact. Targeting individual compounds is in contrast to traditional radiocarbon dating of bulk samples.

A goal within sustainable chemistry is how to facilitate the use of enzymes in biocatalytic processes; however, a major obstacle is the instability of enzymes once removed from their native environments. **Ana I. Benítez-Mateos** details strategies to enhance enzyme stability with the aim of widening the scope of applications of enzymes in biocatalysis. The research team led by **Amy E. Fraley** focuses on natural product biosynthesis and her article details enzymes (including terpene cyclases and Pictet-Spenglerases) that are applied to target cyclic natural products. The design of chiral catalysts that offer control over enantioselectivity in radical transformations is the underlying theme of the research of **Giuseppe Zuccarello**; he describes the development of bifunctional photocatalysts which exhibit a hydrogen bonding motif for substrate recognition and a diaryl ketone photosensitizer enclosed within a chiral framework. Advances in the field of sustainable catalysis are addressed in the review by **Josep Mas Roselló** who describes developments in chiral frustrated Lewis pair-based catalysts for asymmetric hydrogenations as well as scope for expanding the applications of these metal-free catalysts.

In addition to these articles, I point readers towards the research of Assistant Professor **Kjell Jorner** (ETHZ) who published a summary of his work in *CHIMIA* in 2023 (https://www.chimia.ch/chimia/article/view/2023_22).

I hope that this issue of *CHIMIA* will allow readers to appreciate the exceptional talent of some of our newest colleagues in chemistry in Switzerland.

Catherine Housecroft
Editor-in-Chief, *CHIMIA*

The cover illustration represents a new dawn in scientific excellence in Switzerland. The background photograph is credited to Catherine Housecroft, and the map is courtesy of [https://commons.wikimedia.org/wiki/File:Switzerland_\(no_subdivisions\)_location_map.svg](https://commons.wikimedia.org/wiki/File:Switzerland_(no_subdivisions)_location_map.svg)

The *CHIMIA* Editorial Board is very grateful to Prof. em. Catherine Housecroft for her efforts in bringing together this issue on Young Professors and Ambizione Fellows in Switzerland showcasing some of the new upcoming talent in Switzerland.