Tandem Catalysis Utilizing Olefin Metathesis Reactions

Invited for the cover of this issue is the group of Karol Grela at the Polish Academy of Sciences and at the University of Warsaw. The image depicts the olefin metathesis catalyst (“Charlie”) working side-by-side with the hydrogenation catalyst. Read the full text of the article at 10.1002/chem.201505136.

What do you consider the exciting developments in the field?
Since olefin metathesis became one of the most powerful methodologies for C=C double bond formation, many beneficial improvements have been reported in this field, including enhancement of the catalyst stability, activity and selectivity, applications of metathesis in green solvents or in water, and many more. In addition to these developments, one can observe an increased interest in utilising this reaction in various tandem processes. Considering the enormous number of transformations that may be coupled with olefin metathesis, it is only a matter of time until new inspiring examples of tandem catalysis involving olefin metathesis will be reported.

What other topics are you working on at the moment?
Beside our research in the area of olefin metathesis, we are also perusing various Pd-, Cu- and Au-catalysed reactions, in order to use them in general organic synthesis, medicinal chemistry, valorisation of renewable materials, polymer production, and so forth. We are also interested in the synthesis of new N-heterocyclic carbenes (NHC) as versatile ligands for transition metals. With respect to green chemical production, we are working on the use of unconventional solvents (e.g. water, ethyl lactate, carbonates) in olefin metathesis and related transition-metal-catalysed reactions. By employing ammonium-tagged NHC ligands, we have co-developed a new class of polar catalysts for easy purification, immobilisation, and for conducting metathesis in continuous flow. Our alternative approach to the problem of facile reaction purification is related to the development of new efficient scavengers for transition metals.

Who designed the cover?
Both the cover and the frontispiece pictures were hand painted in watercolour by Polish artist Katarzyna Czyżyńska-Golos (fb.com/effe.fineart) and then handled in GIMP. The structures in the foreground were added using LibreOffice. Our group uses Open Source software extensively. Ms. Czyżyńska-Golos has already produced a great number of delightful graphical abstracts and covers for our publications.