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Chemistry

Platform of the Swiss Academy of Sciences

### The 3<sup>rd</sup> Young Faculty Meeting – Looking Back at the Past to Better Anticipate the Future

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The third *Young Faculty Meeting* (YFM) took place on June 25, 2010 at the University of Bern and brought together twenty young researchers from all Swiss universities and both federal institutes of technology, gathering many sub-disciplines of chemistry. This yearly symposium is again sponsored by the *Platform Chemistry* of the Swiss Academy of Sciences (SCNAT) in order to promote both scientific exchange and networking for young academics in chemistry. This year's organizers were **Barbara Winter-Werner** (Chief Science Officer, Platform Chemistry SCNAT) and **Clément Mazet** (University of Geneva). The morning session and the last part of the afternoon session were dedicated to 30-minute presentations by six young academics. Major fields of chemistry were represented and a very colorful and exciting survey of the various research topics was given.

Following a brief foreword by **Clément Mazet** and **Karl Gademann** (University of Basel and President of the Platform Chemistry of the Swiss Academy of Sciences) the meeting was officially opened. The first speaker of the morning session, **Stefan Willitsch** (University of Basel), presented the recent achievements of his group in the generation of gas-phase molecules and molecular ions at sub-Kelvin translational temperatures (~1 K). He demonstrated why this method allows unprecedented control over the collision energy and internal quantum state of the reaction partners. He also showed why this approach also offers prospects to unravel fine details of the chemical dynamics and steer chemical processes at the quantum level. The lecture of **Andreas Zumbühl** (University of Geneva) started with some philosophical thoughts demonstrating why lipids are key constituents for life on our planet. Phospholipids are a class of modular molecules possessing two hydrophobic acyl chains and a hydrophilic head-group held together by a glycerol moiety. The Zumbühl group anticipates that modifying the nature of the glycerol moiety will lead to structurally interesting non-natural phospholipids with unprecedented behavior. In order to access these original target molecules, new phosphorylation procedures are needed because the typical reagents are typically not reactive enough, too expensive or prone to oxidation. Two new cheap and readily available reagents were presented together with a library of new structurally modified phospholipids. After the first coffee break, **Sönke Szidat** (University of Bern) gave a very didactic presentation on the role of carbonaceous aerosols – a ubiquitous sub-class of airborne particulate matter – that have drastic consequences on both climate and contemporary health issues. His laboratory is currently putting tremendous efforts in apportioning and quantifying the sources of carbonaceous aerosols by using radiocarbon <sup>14</sup>C analysis as a major tool. This radioisotope is used for source apportionment of carbonaceous aerosols due to its op-



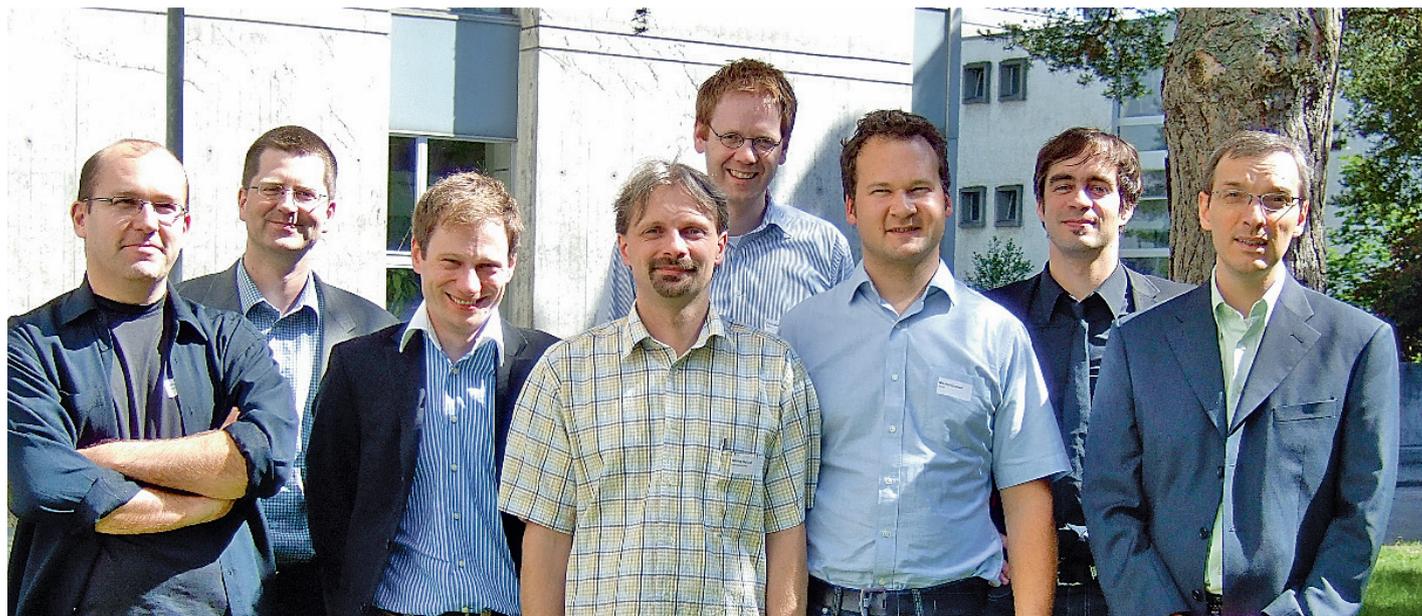
Karl Gademann, President of the *Platform Chemistry* of SCNAT, and Clément Mazet, co-organizer of this year's Young Faculty Meeting.

posite values of modern and fossil materials. As consequence of their age, <sup>14</sup>C has completely disintegrated in fossil substances, whereas modern material is on the contemporary radiocarbon level. Next, **Christian Heinis** (EPFL) described the new phage-selection technology he developed jointly with **Sir Greg Winter** (Laboratory of Molecular Biology – Cambridge, UK) to generate bicyclic peptide ligands with high affinities and specificities for disease protein targets. Not only do these bicyclic peptides combine the high affinity and specificity of antibody therapeutics, but they also might offer major advantages of small molecule drugs such as a high stability, a readily access by modular chemical synthesis and the highly-desired diffusion in tissues. Using this original technique, inhibitors of a serine protease (urokinase-type plasminogen activator) that is involved in tumor growth and invasion have been recently developed. As an introduction to his lecture, **Dominik Brühwiler** (University of Zurich) explained that nanoporous silicates are essential materials that find widespread applications in catalysis, drug delivery, adsorption, and sensing. New methods for the control and analysis of functional group distributions on nanoporous silicates were also presented. They allow an independent modification of external surfaces and channel walls in arrays of silica nanochannels and mesoporous silica spheres. Nanoporous silicates with one-dimensional channel systems were later employed to prepare highly organized host-guest materials for the development of efficient light-harvesting devices.



Thomas R. Ward.

After an enjoyable lunch, Professor **Thomas R. Ward** (University of Basel) shared with us his experience in 'Climbing the Ladder of the Swiss Academic System – Step by Step'. He outlined his academic career, starting as an undergraduate at the University of Fribourg and later as a PhD student at the ETH Zurich under the supervision of Professor Luigi Venanzi working in the field of organometallic



Speakers at the Young Faculty Meeting 2010: Dominik Brühwiler, Andreas Zumbühl, Stefan Willitsch, Sönke Szidat, Christian Heinis, Nicolai Cramer, Clément Mazet and Thomas R. Ward.

chemistry (1988–1991). Professor Ward gave perspicuous insights on the ups and downs of his academic life. After graduating, fascinated by group theory, he joined the group of the Nobel Prize laureate Prof. R. Hoffmann at Cornell University (USA) as a Swiss National Science postdoctoral fellow (1991–1992) with the initial idea to pursue an academic career on the American soil. Influenced by the experience and wisdom of his mentor, he revised his opinion and decided to move back to Switzerland for a second post-doc in the group of the late Prof. C. Floriani at the University of Lausanne. Soon after his return, he was awarded the A. Werner Fellowship and moved to Bern to undertake his independent career in fall 1993. Tom Ward obtained his *Venia Legendi* in 1999 and moved to the University of Neuchâtel in Fall 2000 as a full Professor. After seven years at the University of Neuchâtel, he moved to the University of Basel in March 2008, where he is currently full Professor at the Chemistry Department.

By detailing and sharing his personal experience through the academic system some key messages emerged and were later discussed with the attendees. Several aspects such as research project (“*think outside of the box rather than follow an invisible ‘me too’ type of approach*”), publication strategy, fund raising and timing for job applications were discussed in more detail. Professors *Andreas Ludi* and *Silvio Decurtins* (University of

Bern), who had joined the attendees on this particular occasion, were also kind enough to share their views with the rest of an enthusiastic audience.

**Nicolai Cramer** (ETHZ), who had the privilege to close the afternoon session, gave a splendid lecture on recent synthetic methods to access quaternary stereocenters *via* C–H and C–C activation. Inducing highly enantioselective  $\beta$ -carbon eliminations from *tert*-cyclobutanol using chiral rhodium catalysts, the Cramer group has been able to access primary alkyl-rhodium intermediates bearing quaternary stereogenic centers. Depending on the substrate substitution pattern and the reaction conditions, competing reaction pathways could be promoted exclusively, giving thus access to diversely functionalized products in consistently high yields and enantioselectivities.

The day was concluded with a small aperitif. The Young Faculty Meeting was again a success and the *Platform Chemistry* of the Swiss Academy of Sciences (PFC-SCNAT) is looking forward to welcoming the community of young researchers in the field of chemistry as of next year. The next year’s meeting will be organized by Nicolai Cramer and Christian Heinis.

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