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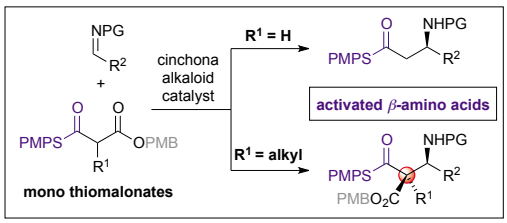
Short Abstracts of Interesting Recent Publications of Swiss Origin

Stereoselective Metal-Free Synthesis of β-Amino Thioesters with Tertiary and Quaternary Stereogenic Centers

A. Bahlinger, S. P. Fritz, and H. Wennemers*, *Angew. Chem. Int. Ed.* **2014**, *53*, 8779. ETH Zürich

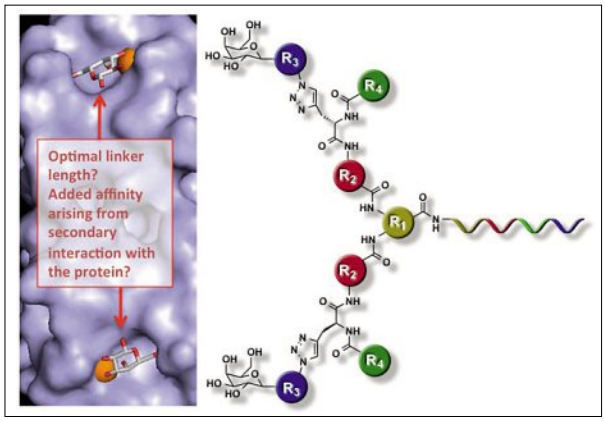
β-Amino thioesters are versatile building blocks for the synthesis of numerous bioactive molecules. A high yielding and remarkably enantioselective-organocatalyzed Mannich reaction was developed by Wennemers and coworkers. This reaction affords acyclic β^2- and $\beta^{2,3,3}$-amino thioesters with adjacent tertiary and quaternary stereocenters. The synthetic value of the β-amino thioesters was demonstrated on the example of a reagent-free peptide coupling. Further studies will provide insight into the reaction scope and the mechanism of this remarkable transformation.



A LecA Ligand Identified from a Galactoside-Conjugate Array Inhibits Host Cell Invasion by *Pseudomonas aeruginosa*

A. Novoa, T. Eierhoff, J. Topin, A. Varrot, S. Barluenga, A. Imberty,* W. Römer,* and N. Winssinger,* *Angew. Chem. Int. Ed.* **2014**, *53*, 8885. Universities of Geneva, Freiburg (D) and Grenoble (F)

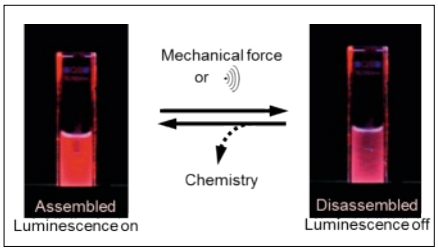
Pseudomonas aeruginosa is a virus which causes lung injury, mortality, and cellular invasion in infected patients. Relying on a combinatorial strategy, the authors identified a divalent ligand which displays very high binding affinity (K_d = 82 nM) to two neighboring binding sites on the surface of the virus. Modelling studies confirmed the chelating nature of this protein-ligand interaction. The cellular evasiveness of *P. aeruginosa* was lowered by up to 90% in the presence of 0.05–5 µM ligand. This remarkable finding may lead to the development of drugs against *P. aeruginosa* infections.



Mechanochemistry with Metallosupramolecular Polymers

D.W R. Balkenende, S. Coulibaly, S. Balog, Y. C. Simon, G. L. Fiore, and C. Weder*, *J. Am. Chem. Soc.* **2014**, *136,* 10493. Adolphe Merkle Institute, Fribourg

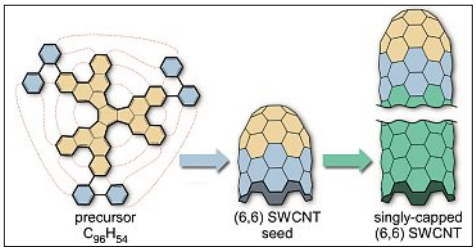
Mechanochemical transduction processes translate mechanical forces into useful chemical reactions thus enabling essential processes in Nature. This concept can be mimicked in synthetic polymers that dissociate under mechanical activation with the formation of products that catalyze other reactions or emit light. Dynamic metallosupramolecular polymer networks based on europium methylbenzimidazole pyridine complexes exhibit mechanical transduction, whereas complexes with dipicolinate ligands do not. These materials can serve both as mechanically-responsive binding motifs and contain a built-in optical probe to monitor the disassembly. Depending on the nature of the material and supramolecular motifs, mechanically-activated reactions can happen (ir) reversibly or not at all. Such supramolecular polymers are thus capable of transducing weak forces into mechanically healable or mechanochromic materials.



Controlled Synthesis of Single-chirality Carbon Nanotubes

J. R. Sanchez-Valencia, T. Dienel, O. Gröning, I. Shorubalko, A. Mueller, M. Jansen, K. Amsharov, P. Ruffieux, and R. Fasel,* *Nature* **2014**, *512*, 61. University Bern, Empa Dübendorf and MPI Stuttgart (D).

The properties of carbon nanotubes strongly depend on their structure which is characterized by an (n,m) chiral index. To fully harness their potential, a process for their isomerically pure production is desirable. Towards this end, a remarkable contribution is presented by Fasel and coworkers. They developed a process in which they exclusively produce (6,6) single-walled carbon nanotubes (SWNTs). For this purpose, they prepare a polyaromatic seed molecule which is deposited on a Pt(111) surface. By a surface-catalyzed cyclo-dehydrogenation, the end-caps of the nanotubes are formed. These are subsequently elongated by incorporation of carbon atoms from a feedstock gas. This development marks a breakthrough in the production of monodisperse SWNTs which are valuable materials for electronic devices.



Prepared by Christophe Daeppen, Valentin Köhler, Raphael Reuter, Mariana Spulber, Adrian von der Höh and Thomas R. Ward

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