



Swiss Science Concentrates

A CHIMIA Column

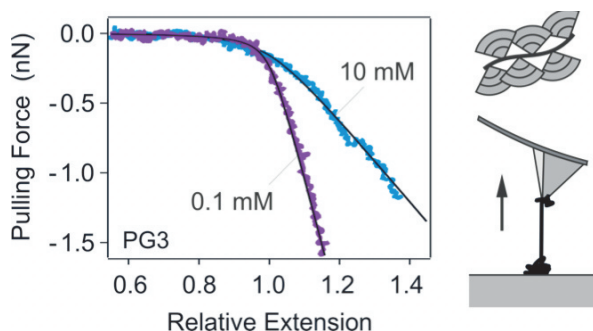
Short Abstracts of Interesting Recent Publications of Swiss Origin

Large Mechanical Response of Single Dendronized Polymers Induced by Ionic Strength

I. Popa, B. Zhang, P. Maroni, A. D. Schlüter*, M. Borkovec*, *Angew. Chem. Int. Ed.* **2010**, *49*, 4250

ETH Zürich and University of Geneva

The authors demonstrate that mechanical properties of single cationic dendronized polymers can be modified in aqueous solutions by the ionic strength. Given the possibility to tune the elasticity of such polymers through the solvent properties, such polymers may become building blocks for single-molecule actuators or motors. These results illustrate the advantage of dendronized polymers, which rely on the same chemistry, but allow systematic variation of their mechanical response.

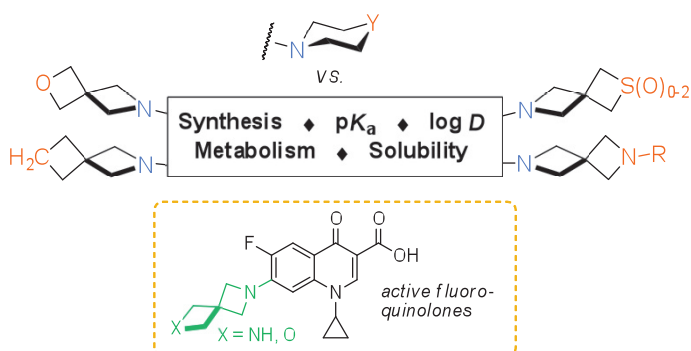


Synthesis of Azaspirocycles and their Evaluation in Drug Discovery

J. A. Burkhard, B. Wagner, H. Fischer, F. Schuler, K. Müller, E. M. Carreira, *Angew. Chem. Int. Ed.* **2010**, *49*, 3524

ETH Zürich and F. Hoffmann-La Roche AG

In this article, the authors report on the interesting pharmacokinetic properties of heteroatom-substituted spiro[3.3]heptanes that generally show higher aqueous solubility than their cyclohexane analogues, and show a trend towards higher metabolic stability. The novel framework can be mounted onto scaffolds of druglike structures, such as fluoroquinolones, to afford active compounds with similar or even improved metabolic stability.

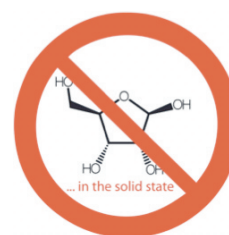


The Crystal Structure of D-Ribose – At Last!

D. Sisak, L. B. McCusker*, G. Zandomenighi, B. H. Meier*, D. Bläser, R. Boese*, W. B. Schweizer, R. Gilmour, J. D. Dunitz*, *Angew. Chem. Int. Ed.* **2010**, *49*, 4503

ETH Zürich and Universität Duisburg-Essen

More than fifty years after the first attempts to determine the crystal structure of D-ribose, the structure has now been established by X-ray analysis of polycrystalline material and of single crystals obtained by advanced zone-melting techniques, backed up by solid-state ^{13}C MAS NMR studies. The β -furanose form, present in countless biomolecules, does not occur in the crystalline compound. Two polymorphs have been identified; both are disordered structures built from α - and β -pyranose molecules with the latter predominating.



Phosphopantetheinyl Transferase-Catalyzed Formation of Bioactive Hydrogels for Tissue Engineering

K. A. Mosiewicz, K. Johnsson, M. P. Lutolf*, *J. Am. Chem. Soc.* **2010**, *132*, 5972

EPF Lausanne

Herein is reported the PPTase-catalyzed formation of polymer hydrogels, as well as the selective covalent modification of hydrogels with bioactive peptide ligands in one step. Hydrogels were formed from two building blocks containing two phosphopantetheinylation sites. Cross-linking was mediated through the action of the surfactin synthetase from *Bacillus subtilis*, a small 16.2 kDa enzyme belonging to the PPTase family, advantageous due to its high expression yield, ease of purification, and very high specificity. Gels were formed within minutes and the physicochemical properties of this new class of biomaterials were characterized. 3D encapsulation of cells resulted in high cell viability (ca. 95%) and single cell migration over long distances within RGDS-modified gels.

