



Swiss Science Concentrates

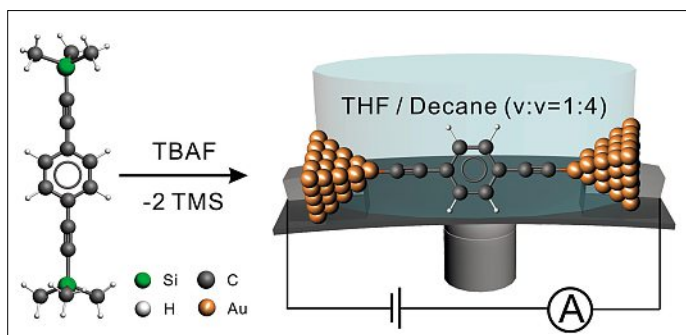
A CHIMIA Column

Short Abstracts of Interesting Recent Publications of Swiss Origin

Trimethylsilyl-Terminated Oligo(phenylene Ethynylene)s: An Approach to Single-Molecule Junctions with Covalent Au–C σ -Bonds

W. Hong, H. Li, S.-X. Liu*, Y. Fu, J. Li, V. Kaliginedi, S. Decurtins, and T. Wandlowski*, *J. Am. Chem. Soc.* **2012**, *134*, 12425. University of Bern

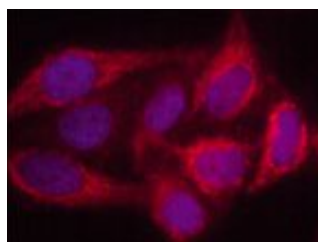
Conductive contacts between single molecules are interesting tools for studying charge transport in nanoscale devices. In this paper the authors exploit the well-known chemistry of the TMS protecting group to create covalent Au–C σ -bonds that function as mechanically stable single-molecule junctions. A series of TMS terminated oligo-(phenylene ethynylene)s (OPEs) were used to form single molecule wires connected through gold electrodes and their conductance was measured. Importantly, the novel Au-junctions exhibited conductances that were appreciably higher than state-of-the-art analogs.



Molecular and Cellular Characterization of the Biological Effects of Ru(II) Complexes Incorporating 2-Pyridyl-2-pyrimidine-4-carboxylic Acid

V. Pierroz, T. Joshi, A. Leonidova, C. Mari, J. Schur, I. Ott, L. Spiccia*, S. Ferrari*, and G. Gasser*, *J. Am. Chem. Soc.* **2012**, *134*, 20376. Universities of Zürich, Monash (AU) and Braunschweig (DE)

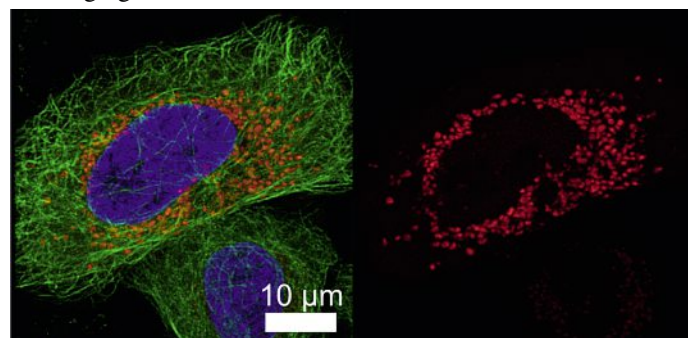
Pt(II) complexes are among the most widely used anti-cancer chemotherapeutics. The authors present a substitutionally inert ruthenium polypyridyl complex with extended aromatic scaffolds that performs equally well or better than cisplatin when tested against a variety of tumor lines. Despite its propensity to intercalate DNA, the authors demonstrate that the biological effects that their complex induces do not involve a DNA-related mode of action but a mitochondria-related pathway.



A Near-infrared Fluorophore for Living-cell Super-resolution Microscopy of Cellular Proteins

G. Lukinavičius, K. Umezawa, N. Olivier, A. Honigmann, G. Yang, T. Plass, V. Mueller, L. Reymond, I. Corrêa Jr, Z.-G. Luo, C. Schultz, E. Lemke, P. Heppenstall, C. Eggeling, S. Manley, and K. Johnsson*, *Nature Chem.* **2013**, *5*, 132. EPF Lausanne

Near-infrared fluorophores are attractive probes for live-cell imaging. However, many of these are not compatible with coupling to proteins *in vivo*. The authors describe a new class of silicon-containing rhodamine dyes, linked to different protein tags. The fluorophore lies in equilibrium with its non-fluorescent spirolactone tautomer. When the silicon-containing rhodamine is bound to hydrophobic environments, the equilibrium is shifted to the spirolactone. Covalent binding to a target protein favors the fluorescent zwitterionic form. The resulting reduction of background fluorescence, combined with high permeability, brightness and photostability, make it a promising new tool for bioimaging.



Total Synthesis and Stereochemical Revision of the Chlorinated Sesquiterpene (\pm)-Gomerone C

N. Huwyler and E. M. Carreira, *Angew. Chem. Int. Ed.* **2012**, *52*, 13066. ETH Zürich

The sesquiterpene Gomerone C is one of over 500 halogenated products isolated from red algae, genus *Laurencia*. Carreira and Huwyler describe the first total synthesis of Gomerone C via a 15-step linear sequence. Key steps of the synthesis include: i) a Diels-Alder reaction to install two contiguous quaternary centers, ii) a one-step formation of an alkyne from a ketone using Schwesinger's Base/NfF, iii) the selective oxidation of the 1-silyoxydiene moiety and iv) an elegant late-stage Conia-ene reaction to generate the bicyclo[3.2.1]octane skeleton. The obtained crystal structure of Gomerone C proved that the initial stereochemical assignment at C3 had to be revised.

