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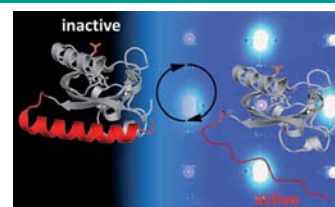


### Enzyme Function

U. Krauss,\* T. Drepper, K.-E. Jaeger

#### Enlightened Enzymes: Strategies To Create Novel Photoresponsive Proteins

**Photoswitchable enzymes—lights on!** The photocontrol of protein functions, enzymatic reactions and thus biological activities in living cells and organisms represents a rapidly developing and interdisciplinary field of research at the interface of chemistry and biology. Recently developed methods employ genetically encoded photoreceptor domain fusions for the spatiotemporal control of protein functions (see graphic).



*Chem. Eur. J.*  
DOI: 10.1002/chem.201002716

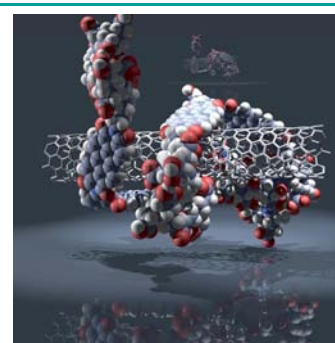


### Nanotubes

C. Backes, C. D. Schmidt, F. Hauke, A. Hirsch\*

#### Perylene-Based Nanotweezers: Enrichment of Larger-Diameter Single-Walled Carbon Nanotubes

**Tubethumping:** Selective dispersion of single-walled carbon nanotubes (SWCNTs) in order to preferentially solubilize distinct diameters or even chiralities can be considered as the definitive sorting tool. The enrichment of SWCNTs with diameters larger than 0.8 nm by a novel tweezer-type dispersant with perylene bisimide moieties as SWCNT anchor groups is presented.



*Chem. Asian J.*  
DOI: 10.1002/asia.201000647

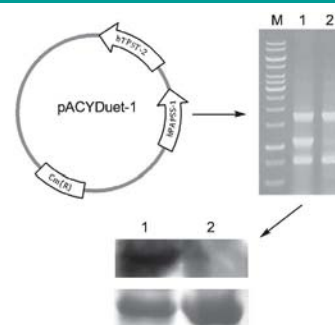


### Posttranslational Modifications

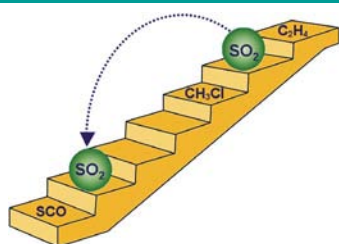
L.-Y. Lu, B.-H. Chen, J. Y.-S. Wu, C.-C. Wang, D.-H. Chen, Y.-S. Yang\*

#### Implantation of Post-translational Tyrosylprotein Sulfation into a Prokaryotic Expression System

**Sulfation made easy:** Syntheses of tyrosine-sulfated proteins were developed by coupling an in situ 3'-phosphoadenosine-5'-phosphosulfate (PAPS)-generating system and tyrosylprotein sulfotransferase (TPST) catalysis. High catalytic efficiency of TPST in vitro was demonstrated, and by using a similar strategy, sulfated proteins were produced in vivo through bacterial cultivation.



*ChemBioChem*  
DOI: 10.1002/cbic.201000540



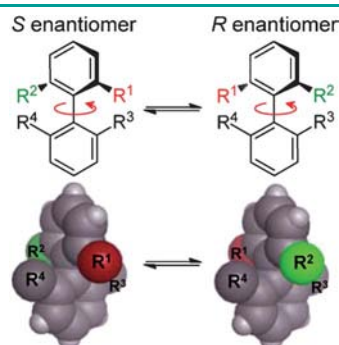
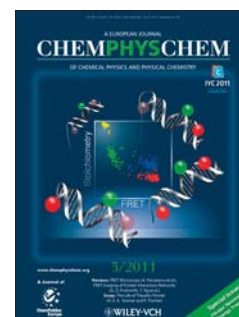
*ChemPhysChem*  
DOI: 10.1002/cphc.201000920

### Gas-Phase Studies

G. de Petris,\* A. Cartoni, M. Rosi, V. Barone, C. Puzzarini, A. Troiani

#### The Proton Affinity and Gas-Phase Basicity of Sulfur Dioxide

**Going down the steps:** New gas-phase experiments and theoretical calculations revise significantly downward the proton affinity and gas-phase basicity of sulfur dioxide (see picture).



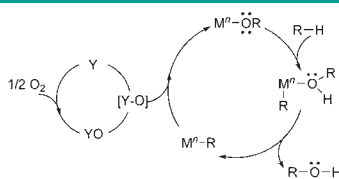
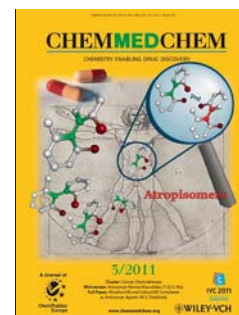
*ChemMedChem*  
DOI: 10.1002/cmdc.201000485

### Drug Discovery

S. R. LaPlante,\* P. J. Edwards, L. D. Fader, A. Jakalian, O. Huckle\*

#### Revealing Atropisomer Axial Chirality in Drug Discovery

**Uncovering stealth chirality:** An often overlooked source of chirality is atropisomerism, which results from slow rotation along a bond axis as a result of steric hindrance and/or electronic factors. A combination of strategies is introduced to flag compounds with atropisomeric properties, and a categorization scheme helps to foresee potential development plans.



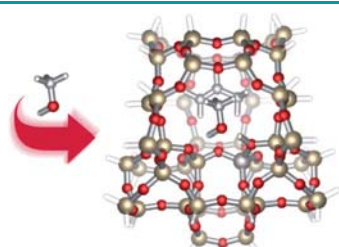
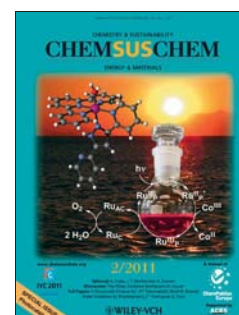
*ChemSusChem*  
DOI: 10.1002/cssc.201000319

### Methanol Economy

J. R. Webb, T. Bolaño, T. B. Gunnoe\*

#### Catalytic Oxy-Functionalization of Methane and Other Hydrocarbons: Fundamental Advancements and New Strategies

**The controlled conversion** of methane to methanol requires C–H bond cleavage and C–O bond formation. A catalytic cycle incorporating 1,2-CH-addition and net oxygen insertion with late transition metals has been proposed for this conversion. This Minireview discusses the current state of the art for each step of the proposed catalytic cycle.



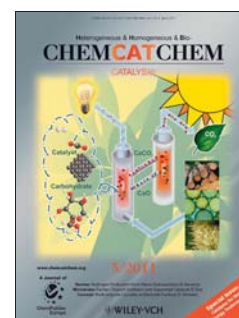
*ChemCatChem*  
DOI: 10.1002/cctc.201000286

### Density Functional Theory

D. Lesthaeghe, J. Van der Mynsbrugge, M. Vandichel, M. Waroquier, V. Van Speybroeck\*

#### Full Theoretical Cycle for both Ethene and Propene Formation during Methanol-to-Olefin Conversion in H-ZSM-5

**For methanol-to-olefin** conversion in H-ZSM-5, theoretical simulations provide evidence that the ‘alkene cycle’ offers a viable path to the production of both propene and ethene, in contrast to the failing direct mechanisms. Combined with earlier work on polymethylbenzenes as active hydrocarbon pool molecules, it is clear that, in H-ZSM-5, multiple parallel and interlinked routes operate on a competitive basis.



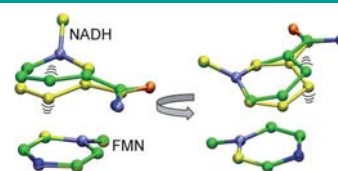


### Enzymatic Hydrogen Transfer

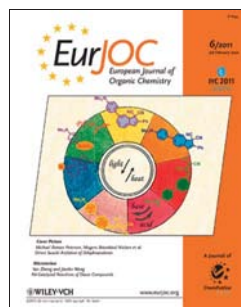
L. O. Johannissen,\* N. S. Scrutton, M. J. Sutcliffe\*

#### How Does Pressure Affect Barrier Compression and Isotope Effects in an Enzymatic Hydrogen Tunneling Reaction?

**Promoting vibrations**—sub-ps donor–acceptor compressive modes in H-transfer reactions—cannot be directly observed experimentally. By using molecular dynamics simulations, an enzymic promoting vibration was identified that becomes stiffer with increasing pressure. This result explains previously observed changes in the rate and kinetic isotope effect for this enzyme-catalyzed H-transfer (see picture; NADH = nicotinamide adenine dinucleotide, FMN = flavin mononucleotide).



Angew. Chem. Int. Ed.  
DOI: 10.1002/anie.201006668

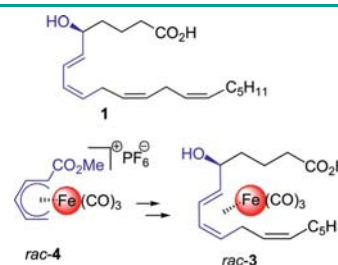


### Iron-Containing HETE Analogues

N. Kausch-Busies, B. Kater, J. M. Neudörfl, A. Prokop, H.-G. Schmalz\*

#### Synthesis and First Biological Evaluation of an Iron-Containing HETE Analogue

As a metal-containing analogue of the eicosanoid 5-HETE, iron carbonyl complex *rac-3* was stereoselectively synthesized from cationic pentadienyl-Fe(CO)<sub>3</sub> precursor *rac-4*. Sensitive complex *rac-3* was shown to selectively induce apoptosis in relevant tumor cell lines.



Eur. J. Org. Chem.  
DOI: 10.1002/ejoc.201001445

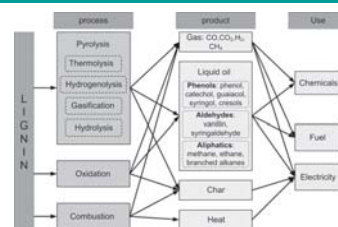


### Lignin Depolymerization

M. P. Pandey, C. S. Kim\*

#### Lignin Depolymerization and Conversion: A Review of Thermochemical Methods

An efficient and commercially competitive lignocellulosic biorefinery requires optimum utilization of all biomass components. Till date, lignin is the most underutilized component of a lignocellulosic biomass. However, lignin depolymerization with selective bond cleavage can convert it into various value-added chemicals including monomeric phenols and phenolic aldehydes.



Chem. Eng. Technol.  
DOI: 10.1002/ceat.201000270