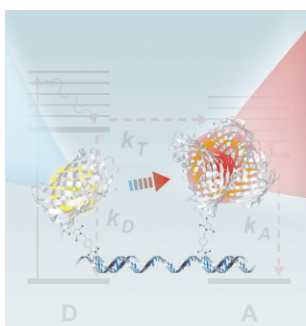


# Organic & Biomolecular Chemistry

INDEXED IN MEDLINE

Incorporating Acta Chemica Scandinavica

**Cover**

See Florian Kukolka and Christof M. Niemeyer, pp. 2203–2206.

The cover art depicts the potential application of fluorescent proteins covalently conjugated with single-stranded DNA in the assembly of artificial supramolecular photosystem units. The enhanced yellow fluorescent protein (EYFP)–DNA conjugate can act as a donor in fluorescence-resonance-energy-transfer to a red fluorescent protein (RFP)–DNA conjugate acceptor, bound in close proximity on a template DNA strand.

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## contents

C57 C64

### Chemical Science

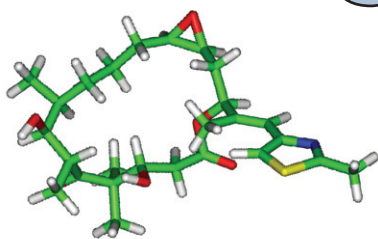
August 2004/Volume 1/Issue 8

[www.rsc.org/chemicalscience](http://www.rsc.org/chemicalscience)

Drawing together the research highlights and news from all RSC publications, *Chemical Science* provides a 'snapshot' of the latest developments across the chemical sciences showcasing newsworthy articles, as well as the most significant advances.

### PERSPECTIVES

2137 2152



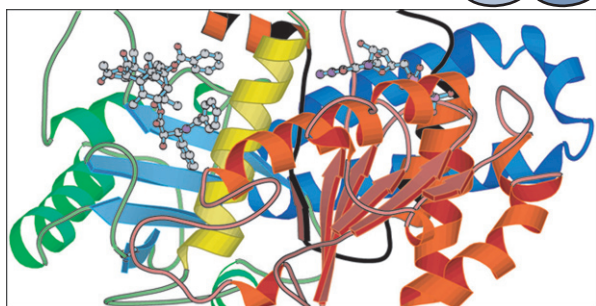
Structure of tubulin-bound epothilone A

#### The merger of natural product synthesis and medicinal chemistry: on the chemistry and chemical biology of epothilones

Karl-Heinz Altmann

Based on epothilones as powerful natural product leads several promising new anticancer agents have emerged through concerted efforts in chemistry and biology.

2153 2160



### Microtubule structure and its stabilisation

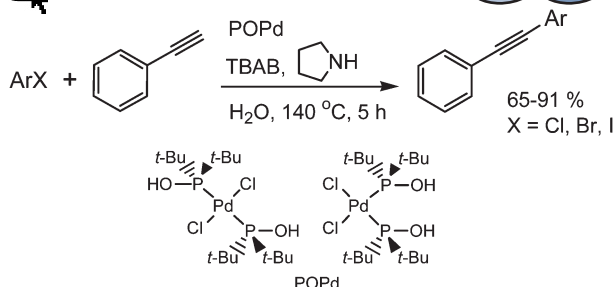
Linda A. Amos

Anticancer drugs that work on microtubules depend on the unique properties of tubulin and the lattice into which it assembles.

## COMMUNICATIONS



2161 2164



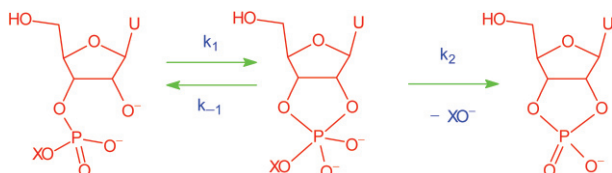
### Palladium–phosphinous acid-catalyzed Sonogashira cross-coupling reactions in water

Christian Wolf and Rachel Lerebours

Palladium–phosphinous acid catalyzed Sonogashira cross-coupling reactions of aryl chlorides and bromides in water afford alkynes in good to high yields.



2165 2167



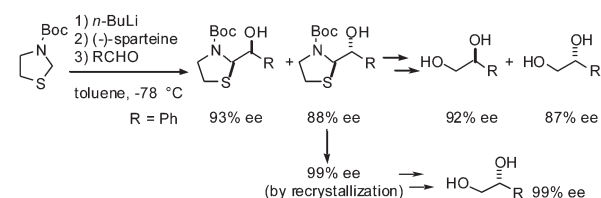
### Compelling evidence for a stepwise mechanism of the alkaline cyclisation of uridine 3'-phosphate esters

Harri Lönnberg, Roger Strömberg and Andrew Williams

Compelling evidence is advanced for a pentacoordinate intermediate in the alkaline cyclisation of ribonucleoside-3'-phosphate esters.



2168 2169

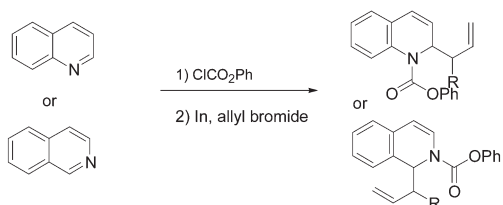


### Highly enantioselective reaction of lithiated *N*-Boc-thiazolidine: a new chiral formyl anion equivalent

Libo Wang, Shuichi Nakamura and Takeshi Toru

Lithiated *N*-Boc-thiazolidine was proved to be an efficient chiral formyl anion equivalent, giving optically active 1,2-ethanediols.

2170 2172



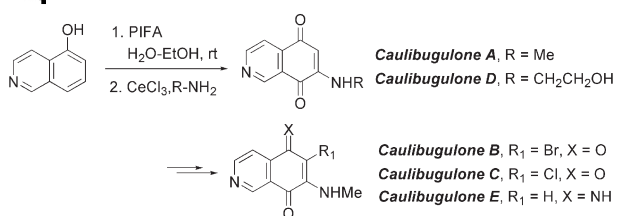
### Indium mediated allylation of quinoline and isoquinoline activated by phenyl chloroformate

Seung Hwan Lee, Young Sang Park, Mi Hae Nam and Cheol Min Yoon

Quinoline and isoquinoline activated by phenyl chloroformate were allylated using indium and allyl bromides in THF at room temperature to give the corresponding allyldihydroquinoline and allyldihydroisoquinoline in good to high yields.



2173 2174



### Synthesis and biological evaluation of caulibugulones A–E

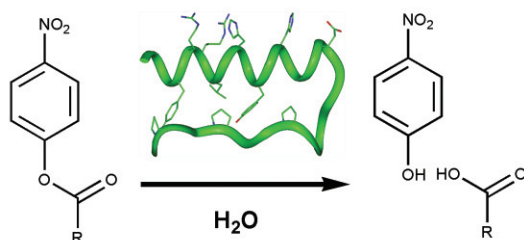
Peter Wipf, Beomjun Joo, Theresa Nguyen and John S. Lazo

A convergent synthetic approach toward the caulibugulones was developed. The natural products were found to be potent and selective dual-specificity phosphatase inhibitors.

## ARTICLES



2175 2180

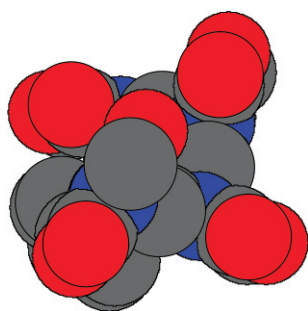


### Nucleophilic and general acid catalysis at physiological pH by a designed miniature esterase

Andrew J. Nicoll and Rudolf K. Allemann

Art-Est acts as a miniature esterase through nucleophilic and general acid catalysis by a His–His<sup>+</sup> pair.

2181 2187

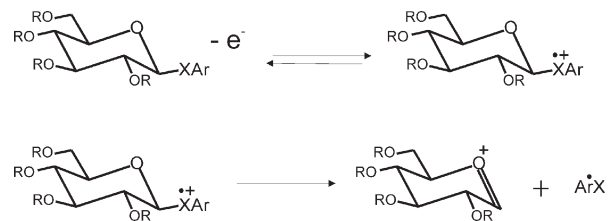


### $\beta$ -Pseudopeptide foldamers. The homo-oligomers of (4*R*)-(2-oxo-1,3-oxazolidin-4-yl)-acetic acid (D–Oxac)

Gianluigi Luppi, Roberta Galeazzi, Marco Garavelli, Fernando Formaggio and Claudia Tomasini

A total synthesis in solution and a conformational analysis of the homo-oligomers of (4*R*)-(2-oxo-1,3-oxazolidin-4-yl)-acetic acid (D–Oxac) to the tetramer level are described.

2188 2194

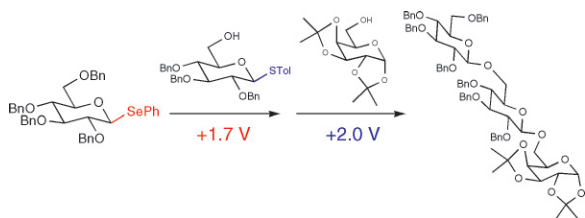


### Selective activation of glycosyl donors utilising electrochemical techniques: a study of the thermodynamic oxidation potentials of a range of chalcoglycosides

Robert R. France, Neil V. Rees, Jay D. Wadhawan, Antony J. Fairbanks and Richard G. Compton

Several chalcoglycosides are investigated electrochemically to determine their formal redox potentials. The oxidations are shown to follow an overall EC-type mechanism.

2195 2202

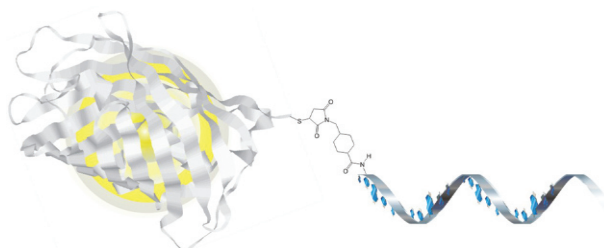


### Selective electrochemical glycosylation by reactivity tuning

Robert R. France, Richard G. Compton, Benjamin G. Davis, Antony J. Fairbanks, Neil V. Rees and Jay D. Wadhawan

The selective electrochemical activation of glycosyl donors by reactivity tuning allows the electrochemically mediated synthesis of trisaccharides.

2203 2206

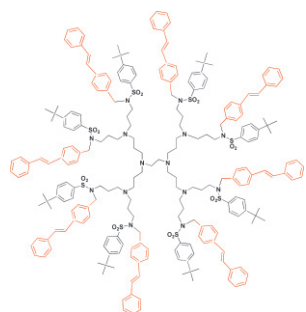


### Synthesis of fluorescent oligonucleotide–EYFP conjugate: Towards supramolecular construction of semisynthetic biomolecular antennae

Florian Kukolka and Christof M. Niemeyer

We synthesized a DNA–EYFP conjugate which could lead to artificial light-harvesting complexes and antenna systems.

2207 2213



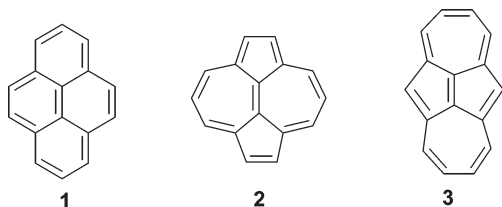
### Photochemical and photophysical properties of a poly(propylene amine) dendrimer functionalised with *E*-stilbene units

Veronica Vicinelli, Paola Ceroni, Mauro Maestri, Mariachiara Lazzari, Vincenzo Balzani, Sang-Kyu Lee, Jeroen van Heyst and Fritz Vögtle

The stilbene units of a second generation poly(propylene amine) dendrimer exhibit photophysical and photochemical properties different from those of an isolated stilbene.



2214 2219

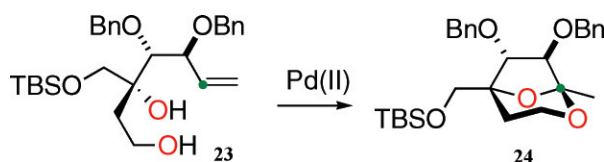


### Electrophilic and oxidative chemistry of pyrene and its non-alternant isomers: theoretical (DFT, GIAO-NMR, NICS) study of protonation carbocations and oxidation dicationic species from pyrene, azupyrene (dicyclopenta[*ef,kl*]heptalene) and dicyclohepta[*ed,gh*]pentalene

Takao Okazaki and Kenneth K. Laali

Mono- and diprotonated carbocations and the two-electron oxidation dicationic species derived from parent pyrene **1** and its nonalternant isomers “azupyrene” (dicyclopenta[*ef,kl*]heptalene; DCPH) **2** and dicyclohepta[*ed,gh*]pentalene (DCHP) **3** were studied by DFT at the B3LYP/6-31G(d) level.

2220 2228

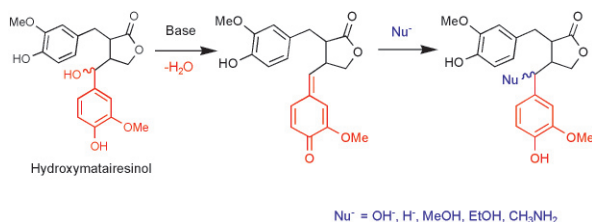


### Enantioselective synthesis of the dioxabicyclo[3.2.1]octane core of the zaragozic acids *via* intramolecular Wacker-type cyclisation reactions

Patrick Perlmutter, Walailak Selajerern and Filisaty Vounatsos

The synthesis of bicyclo[3.2.1]octanes *via* Wacker-type ring closure of alkenediols has been extended to a highly functionalised carbohydrate-derived system.

2229 2235

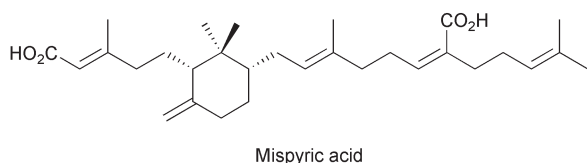


### Reactions of the natural lignan hydroxymatairesinol in basic and acidic nucleophilic media: formation and reactivity of a quinone methide intermediate

Patrik C. Eklund, Fredrik J. Sundell, Annika I. Smeds and Rainer E. Sjöholm

The natural lignan hydroxymatairesinol forms a quinone methide intermediate, which subsequently undergoes nucleophilic addition by nucleophiles in basic media.

2236 2244

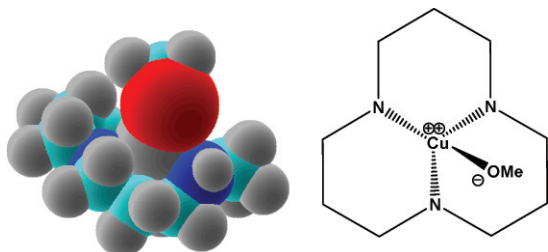


### Triterpenoid total synthesis. Synthesis and absolute configuration of mispyric acid

Yusuke Imamura, Hirosato Takikawa, Mitsuru Sasaki and Kenji Mori

The first synthesis of the enantiomers of mispyric acid, an inhibitor of DNA polymerase  $\beta$ , is described.

2245 2248

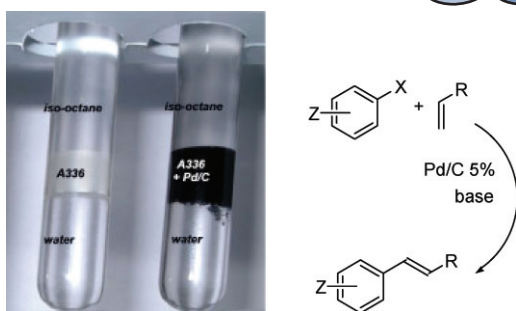


### Cu(II)-Mediated decomposition of phosphorothionate P=S pesticides. Billion-fold acceleration of the methanolysis of fenitrothion promoted by a simple Cu(II)-ligand system

Alexei A. Neverov and R. Stan Brown

Active form of the  $\text{Cu}^{2+}$ - $\text{OCH}_3$ -1,5,9-triazacyclododecane catalyst that provides  $10^9$ -fold acceleration of the methanolysis of fenitrothion.

2249 2252

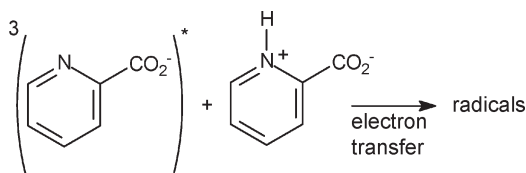


### Heck reaction catalyzed by Pd/C, in a triphasic—organic/Aliquat 336/aqueous—solvent system

Alvise Perosa, Pietro Tundo, Maurizio Selva, Sergei Zinovyev and Alberto Testa

A triphasic solvent system promotes reactivity and selectivity of Pd/C for the Heck reaction, and keeps products—catalyst—byproducts separate.

2253 2261



### Photochemistry of the three carboxypyridines in water: a pH dependent reaction

Florence Rollet, Claire Richard, Jean-François Pilichowski and Bettina Aboab

The photochemistry of carboxypyridines involves the triplet excited state that reacts with the starting molecule *via* an electron transfer.

2262

Philip C. Bulman Page, Steven M. Allin, Suzanne J. Maddocks, and Mark R. J. Elsegood

### New ligands for asymmetric diethylzinc additions to aromatic aldehydes, demonstrating substrate-dependent nonlinear effects