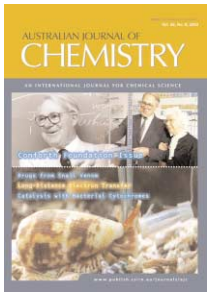
10.1071/CHv54n8toc

Volume 56, Number 8, 2003, xxix



The lower cover shows venom being extracted from *Conus striatus*, a source of drug leads as reported by Alewood et al. (p. 769).

AUSTRALIAN JOURNAL OF CHEMISTRY

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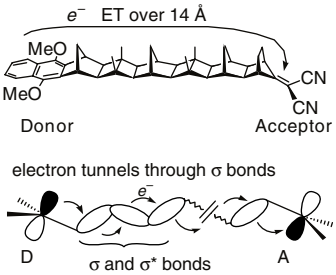
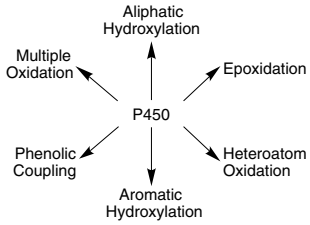
Guest Editorial

On marking the opening of the Cornforth Foundation for Chemistry this issue of *Australian Journal of Chemistry* includes a collection of papers presented at the launch symposium.

Reviews

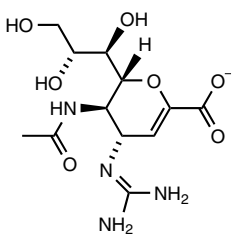


The role of the superexchange mechanism (through-bond coupling) in mediating long-range electron transfer (ET) processes is reviewed. It is shown that superexchange profoundly facilitates ET, even through saturated hydrocarbon bridges in covalently linked donor–bridge–acceptor systems (shown). Strategies are also presented for prolonging the lifetimes of charge-separated states resulting from photoinduced charge separation in these systems.



The cytochromes P450 form a very large family of oxidative haemoproteins, all containing a haem cofactor linked to the peptide backbone of the protein. This cofactor allows the enzyme to activate molecular oxygen to produce a high valent iron-oxo species, which acts as a powerful oxidant and enables these enzymes to carry out an array of oxidative transformations. The various types of transformation catalyzed by bacterial P450s are discussed.

Current Chemistry



Medicines such as Zanamivir (structure shown), which are directed against protein targets where the underlying mutation frequency is large enough to ensure a continuous population of variants, should have the capacity to minimize the emergence of drug-resistant strains. On the basis of current data, the principle is presented here, that medicines which most closely mimic natural ligands might be best at suppressing resistance.

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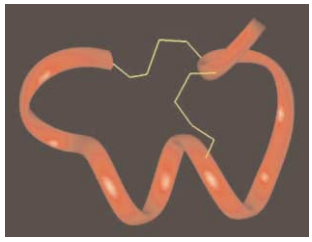
Marine Toxins as Sources of Drug Leads

Paul Alewood, Gene Hopping, Chris Armishaw

Aust. J. Chem. **2003**, *56*, 769–774.



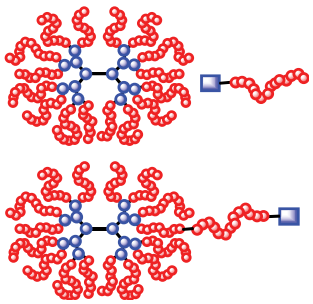
Conotoxins, a class of marine peptides rich in disulfide bonds, contain many of the structural elements present in larger proteins, such as α-helices and β-turns. In addition, these natural products are remarkably stable and exhibit exceptional receptor selectivity. These properties make them ideal candidates for drug development.

Rapid Communications

Evaluating the Effect of Termination by Chain–Chain Coupling in Living Free-Radical Polymerizations

Jeffrey Pyun, Ian Rees, Jean M. J. Fréchet, Craig J. Hawker

Aust. J. Chem. **2003**, *56*, 775–782.



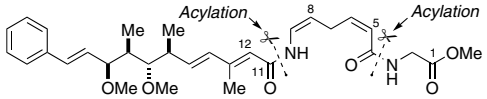
Termination reactions in living free-radical polymerizations are of primary importance, as even minor amounts of chain–chain coupling can impact the living nature of the process. A general procedure is described for evaluating the extent of termination by elucidating the level of incorporation of pyrene units, which are a direct result of termination by inter-chain radical coupling.

Total Synthesis of (+)-Crocacin A

John T. Feutrill, Mark A. Rizzacasa

Aust. J. Chem. **2003**, *56*, 783–785.

(+)-Crocacin A (1), a novel electron-transport inhibitor, is an unusual linear dipeptide, which contains a reactive *N*-acyl enamine or enamide functionality. The first total synthesis of crocacin A is described here, in which the key step involved the construction of the enamide by *N*-acylation of a diencarbamate anion.

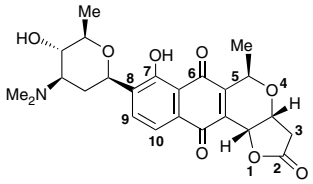


Full Papers

***C*-Glycosylation of Oxygenated Naphthols with 3-Dimethylamino-2,3,6-trideoxy-L-arabino-hexopyranose and 3-Azido-2,3,6-trideoxy-D-arabino-hexopyranose**

Margaret A. Brimble, Roger M. Davey, Malcolm D. McLeod, Maureen Murphy

Aust. J. Chem. **2003**, *56*, 787–794.

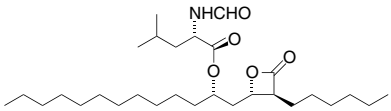


Medermycin (shown) is a unique member of the pyranonaphthoquinone family of antibiotics in that it contains a β-*C*-glycoside linkage to the amino sugar, D-angolosamine. In synthetic efforts towards medermycin, detailed studies are reported on the direct *C*-glycosylation of oxygenated naphthols with azido and dimethylamino glycosyl donors, the products of which can then be further elaborated to give medermycin and its analogues.

The Total Synthesis of (−)-Tetrahydrolipstatin

Jennifer A. Bodkin, Edward J. Humphries, Malcolm D. McLeod

Aust. J. Chem. **2003**, *56*, 795–803.



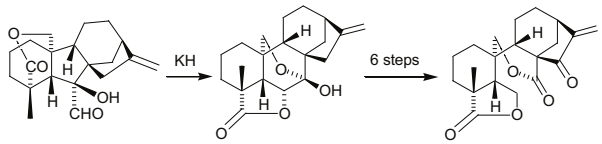
Tetrahydrolipstatin is a potent pancreatic lipase inhibitor used clinically as an anti-obesity drug. The synthesis reported here uses a stereocontrolled bromolactonization reaction of an acyclic precursor, followed by radical debrominization, to construct the strained lactone ring of the target.

Conversion of Gibberellic Acid into the B-Ring *seco*-Kaurenoid, Longirabdolactone

George Adamson, Lewis N. Mander

Aust. J. Chem. **2003**, *56*, 805–809.

The base-catalyzed rearrangement of the 6α-hydroxy derivative of gibberellin GA15 aldehyde results in ring-expansion of the five-membered B-ring and transformation into an *ent*-kaurene derivative. Further manipulation affords access to the highly functionalized B-ring *seco*-kaurenoid bioactive secondary metabolites from the genus *Rabdosia*. The methodology is illustrated by the synthesis of longirabdolactone.

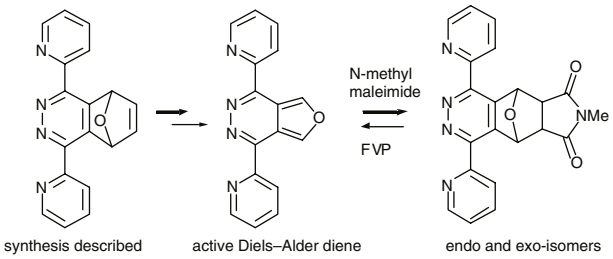


Preparation of the First Isobenzofuran Containing Two Ring Nitrogens: A New Diels–Alder Diene for the Synthesis of Molecular Scaffolds Containing One or More End-Fused 3,6-Di(2-pyridyl)pyridazine Ligands

Ronald N. Warrener, Douglas N. Butler, Davor Margetic

Aust. J. Chem. **2003**, *56*, 811–817.

The syntheses of the first isobenzofuran with two ring nitrogen atoms, 4,7-di(2-pyridyl)-5,6-diazaisobenzofuran, is described, as is its propensity to react as a Diels–Alder diene used to attach the 3,6-di(2-pyridyl)pyrazine ligand onto rigid scaffolds.

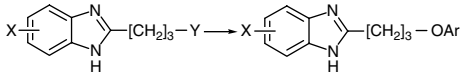


Nitrogen versus Oxygen Group Protection in Hydroxypropylbenzimidazoles

Sutharsiny Indusegaram, Andrew G. Katsifis, Damon D. Ridley, Simone C. Vonwiller

Aust. J. Chem. **2003**, *56*, 819–827.

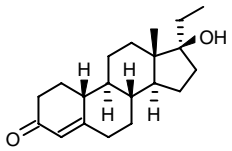
In order to convert 1′*H*-benzimidazol-2′-ylpropanols to aryl ethers via Mitsunobu coupling, it is necessary to protect the benzimidazole nitrogen atom in the starting alcohol. Selective protection was achieved through *N*-benzyl derivatives, but direct protection of the nitrogen atom was complicated by either selective reactions at the oxygen atom or formation of bis-protected products.



Equine Metabolites of Norethandrolone: Synthesis of a Series of 19-Nor-17α-pregnanediols and 19-Nor-17α-pregnanetriols

Andrew R. McKinney, Damon D. Ridley, Peter Turner

Aust. J. Chem. **2003**, *56*, 829–838.



The structures of some major equine urinary metabolites of the synthetic anobolic steroid norethandrolone (shown) have been confirmed by the synthesis of a range of 19-nor-17α-pregnanediols and triols. The synthetic methodologies employed are discussed, particularly with respect to controlling stereoselectivity and optimization. The results of the synthesis allow identification of significant metabolic pathways affecting norethandrolone in the horse.

Author Index