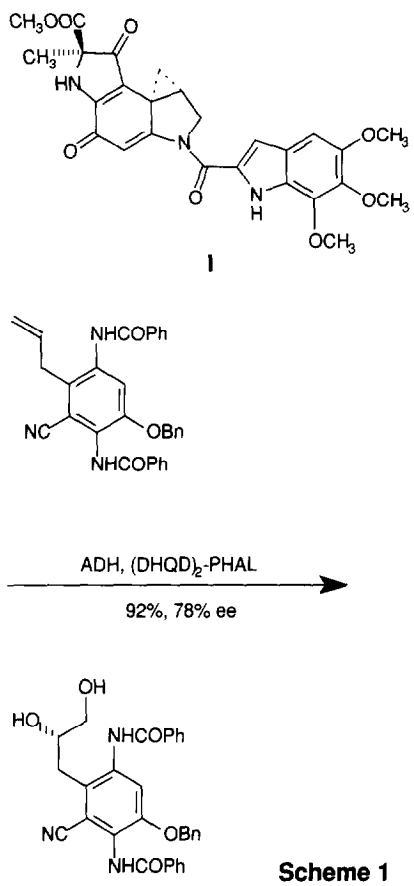
Enantioselective total synthesis of (+)-duocarmycin A

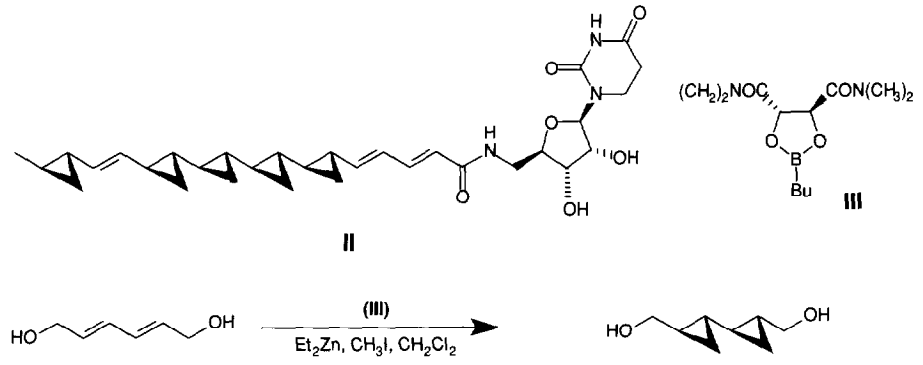
Duocarmycin A **I** is representative of a class of naturally occurring potent antitumour antibiotics that alkylate specific sequences of duplex DNA. Boger, D.L. and coworkers [*J. Am. Chem. Soc.* in press] describe the first enantioselective total synthesis of (+)-duocarmycin A, epi-(+)-duocarmycin A and their unnatural enantiomers. The synthesis also includes the first reported example of a Sharpless asymmetric dihydroxylation reaction, which gives the opposite configuration to that predicted from established models (Scheme 1).



Scheme 1

Total synthesis of antifungal FR-900848

FR-900848 **II** is a potent antifungal nucleoside isolated from *Streptoverticillium fervans* and is selectively active against filamentous fungi, such as *Aspergillus niger*. Barrett, A.G.M. and Kasdorf, K. [*Chem. Commun.* (1996) 325–326] describe the total synthesis of this agent using the asymmetric cyclopropanation methodology recently reported by Charette, A.B. and Juteau, H. [*J. Am. Chem. Soc.* (1994) 116, 2651–2652] (Scheme 2) to control the stereochemistry at the ten stereocentres with the chiral auxillary **III**.



Scheme 2

Selective cleavage of ketals and acetals

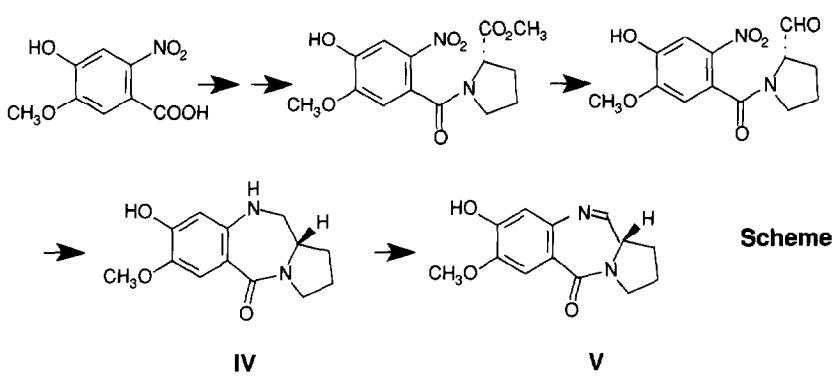
The deprotection of 1,3-dioxolane ketals and acetals is usually accomplished using acid hydrolysis. However, such an approach is problematic for compounds containing acid-sensitive functional groups. Johnstone, C., Kerr, W.J. and Scott, J.S. [*Chem. Commun.* (1996) 341–342] report an alternative approach for the selective cleavage of ketals and acetals under neutral, anhydrous conditions using triphenylphosphine and carbon tetrabromide. Examples demonstrated that this approach may be used to deprotect aromatic, α,β-unsaturated and aliphatic ketals and aromatic and α,β-unsaturated acetals in either dichloromethane or tetrahydrofuran.

Synthesis of pyrrolo [2,1*c*][1,4]benzodiazepie antibiotics

The pyrrolo[2,1-*c*][1,4]benzodiazepine DNA-binding antitumour antibiotics is an important class of agents produced by various *Streptomyces* species and includes anthramycin, tomaymycin and DC-81 **V**. Kamal, A. and Rao, N.V. [*Chem. Commun.* (1996) 385–386] report a new approach to the synthesis of these imine containing pyrrolo[2,1-*c*][1,4]benzodiazepine using the mild oxidation of the cyclic secondary amine **IV** with activated dimethylsulphoxide (Scheme 3). This approach avoids the use of protective and deprotective steps and ensures the stereochemical integrity of the chiral centre at the C-11a position.

Solid-phase synthesis of 2′ and 3′-amino-nucleoside triphosphates

The 2′ and 3′-amino functionalized nucleoside 5′-triphosphates have application as



Scheme 3