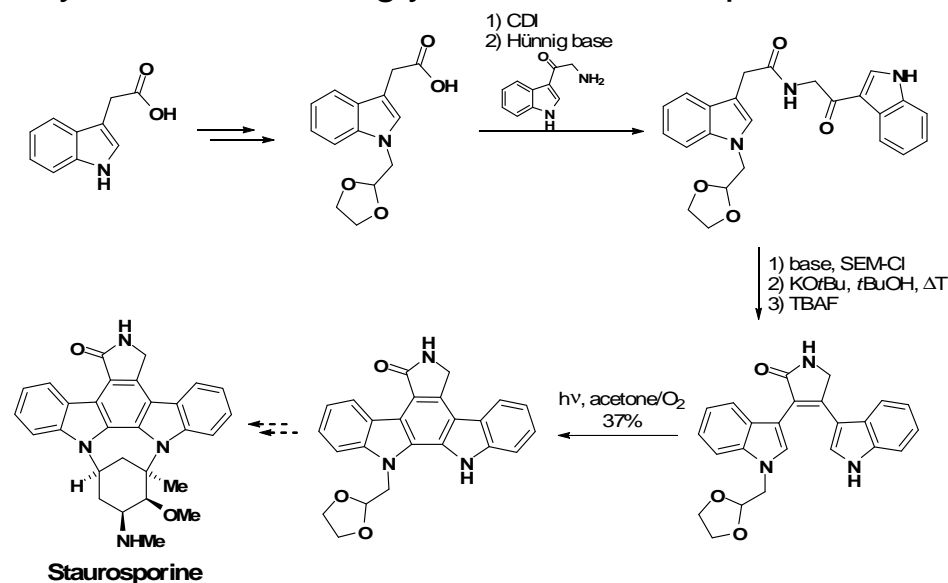


- born 1932 in Danzig (former Germany, now Poland)
- In 1958 he got his PhD for his work on „The Synthesis of Hydroxysparteines“
- Finished his habilitation in 1962
- In 1970 he accepted an offer for a full professorship from the University of Hannover, where he worked and taught till 2000
- Over the years more than 200 diploma and grad students worked in his group
- For his work on Natural Product synthesis he got numerous awards (for example the Emil Fischer Medal), he joined the University of California (Irvine) in 1990 for a guest professorship



Indol Chemistry

Synthesis of the Aglycons of Staurosporine¹

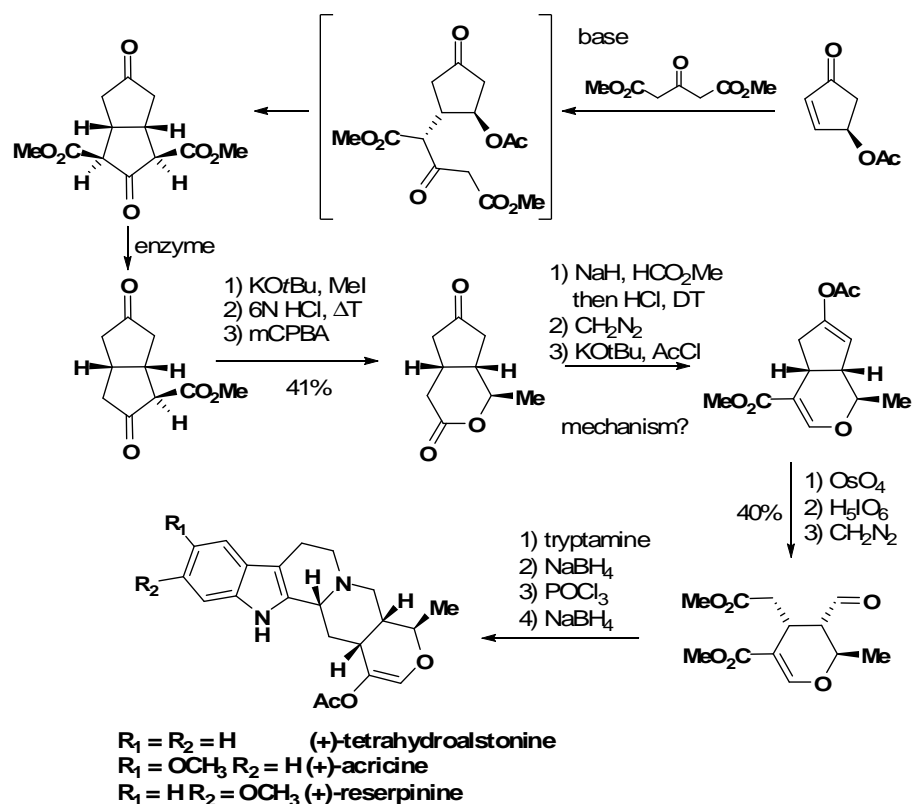


Complete total synthesis of Staurosporine was published by Wood & Stoltz in 1997

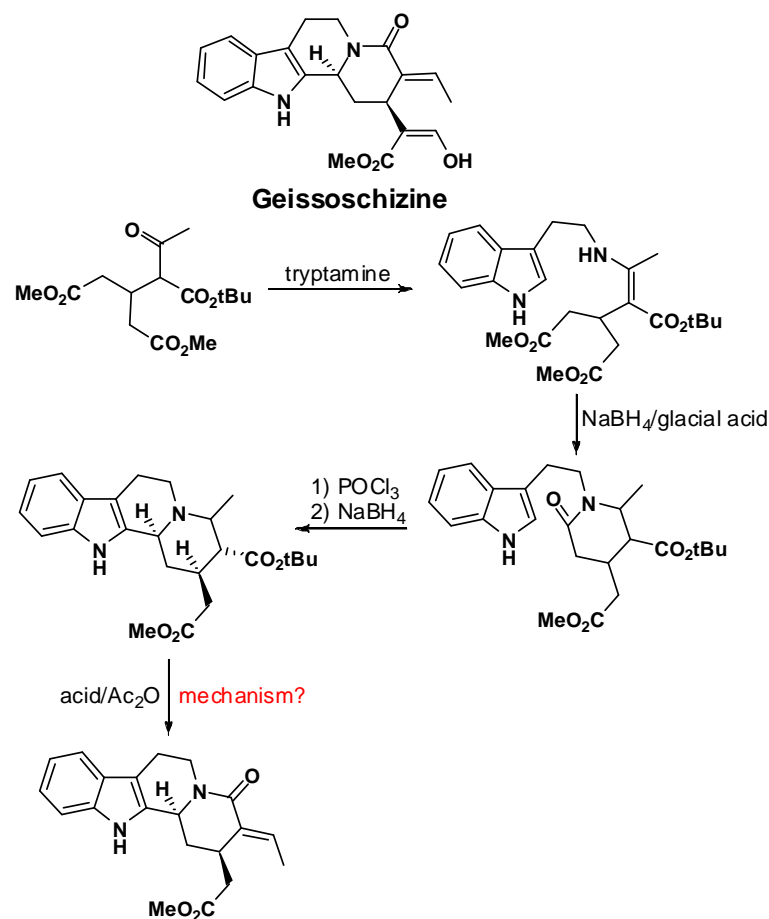
¹ J. Brüning, T. Hache, E. Winterfeldt, *Synthesis* **1994**, 25-27.

Indol Chemistry

Enantioselective Synthesis of (+)-Tetrahydroalstonine,
(+)-Acricine and (+)-Reserpine²



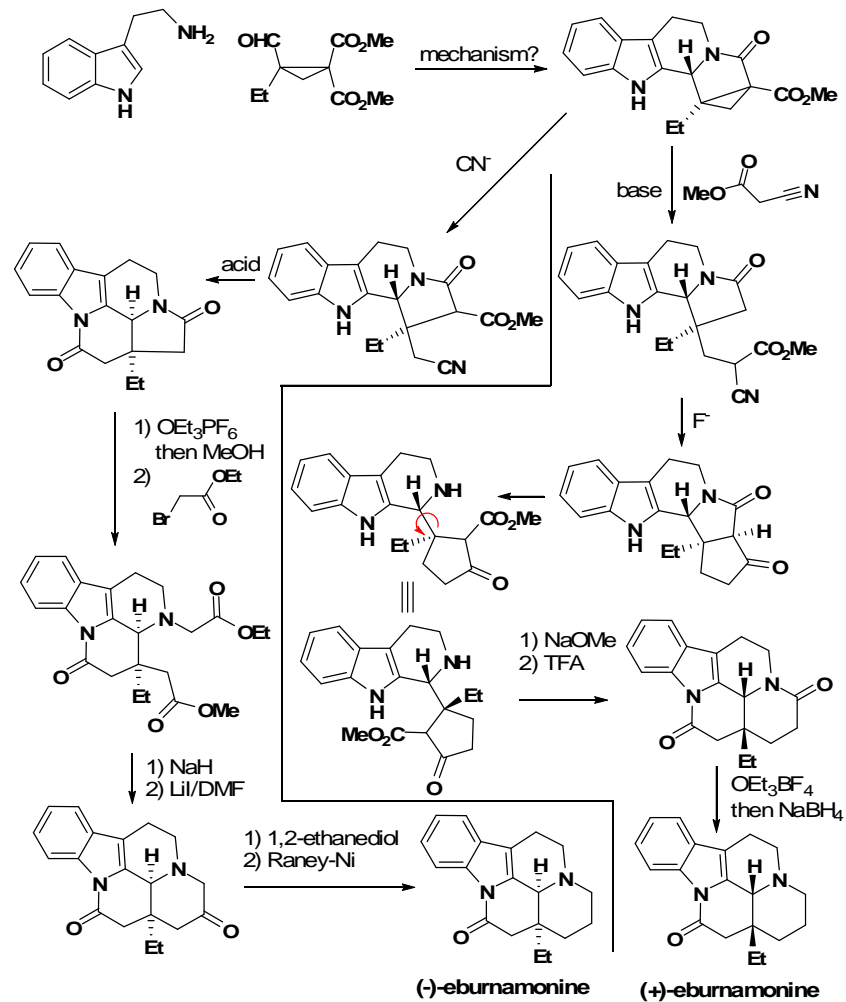
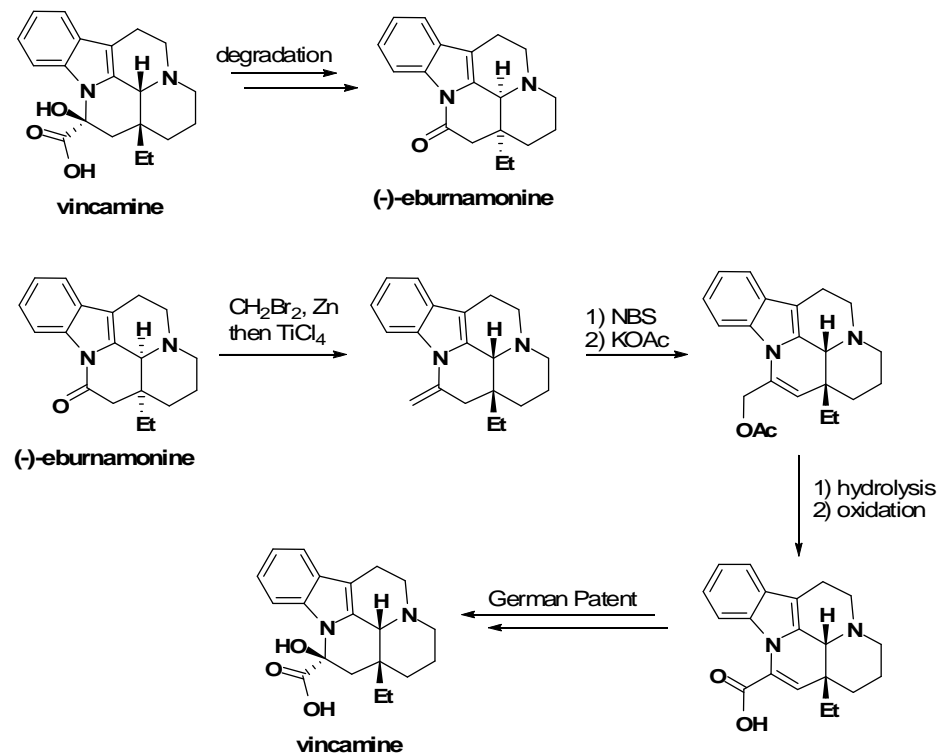
On their way to a Stereoselective Synthesis of
Geissoschizine³



² P. Hölscher, H.-J. Knölker, E. Winterfeldt, *Tetrahedron Lett.* **1990**, 31, 19, 2705-2706.

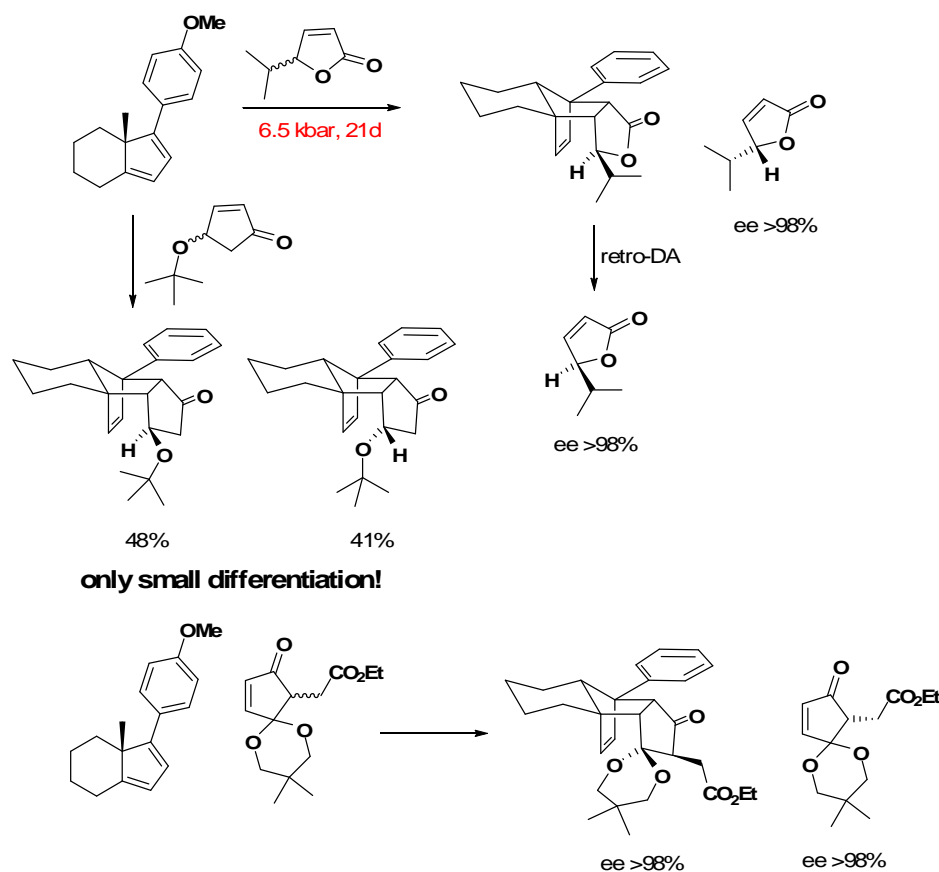
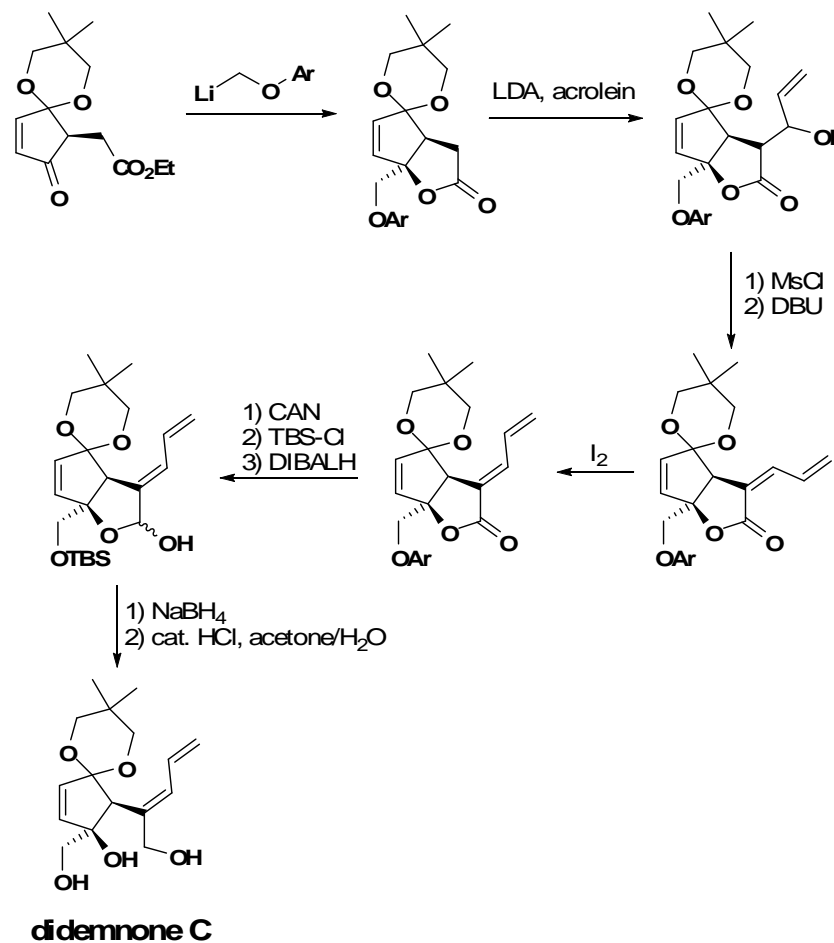
³ W. Benson, E. Winterfeldt, *Angew. Chem.* **1979**, 18, 11, 862-863.

Indol Chemistry

Stereoselective Synthesis of Eburnamonine⁴Stereoselective Synthesis of Vincamine⁴

⁴ K. Hakam, M. Thielmann, T. Thielmann, E. Winterfeldt, *Tetrahedron* **1987**, 43, 9, 2035-2044.

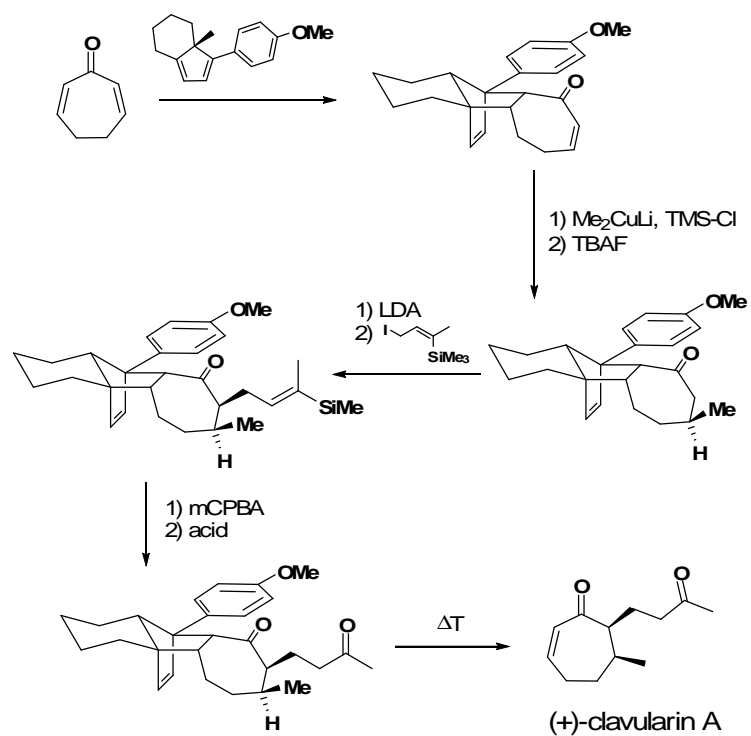
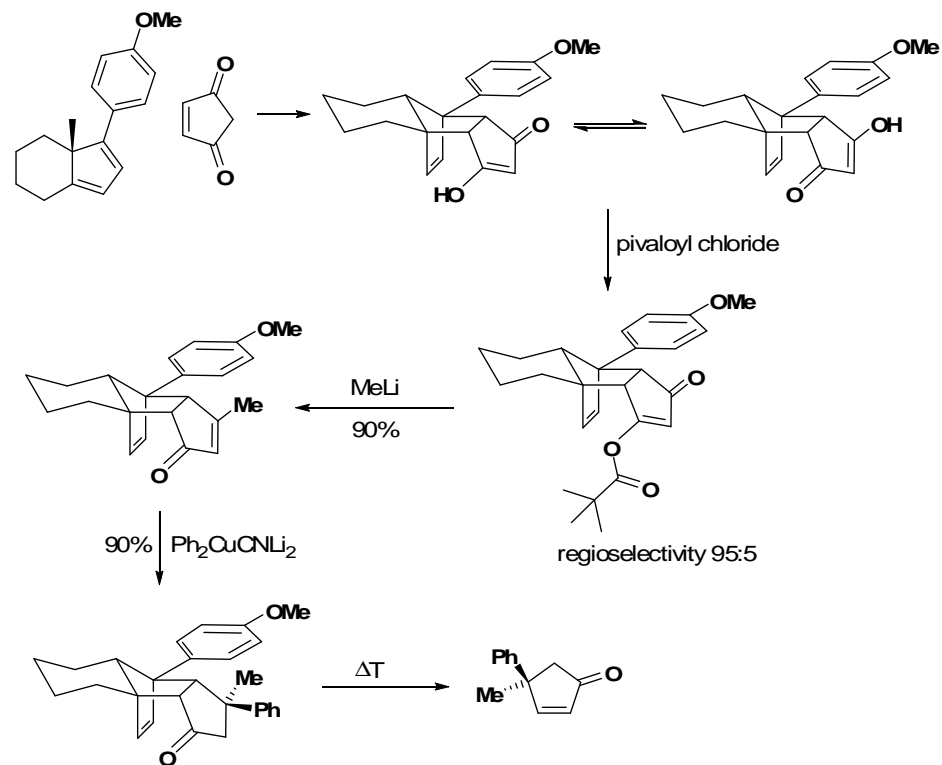
Diels-Alder Chemistry

Discrimination of enantiotopic groups in a DA-reaction⁵Synthesis of Didemnone C⁶

⁵ P. G. Jones, H. Weinmann, E. Winterfeldt, *Angew. Chem. Int. Ed.* **1995**, 34, 4, 448-450.

⁶ M. Göres, E. Winterfeldt, *J. Chem. Soc. Perkin Trans. I* **1994**, 3525-3531.

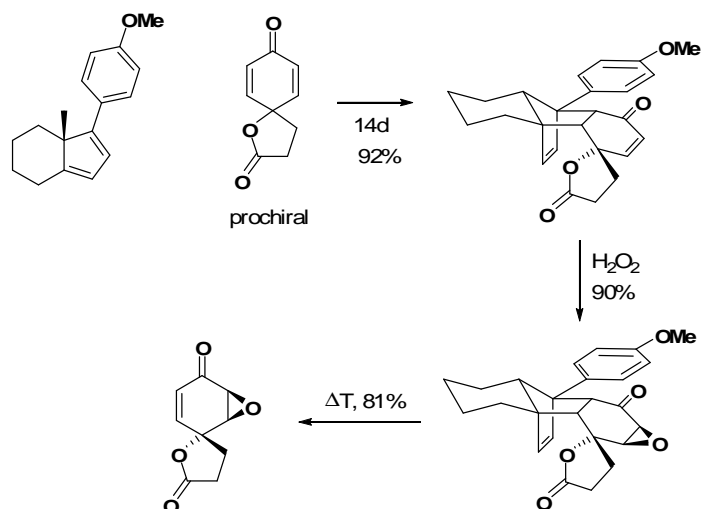
Diels-Alder Chemistry

Enantioselective Synthesis of (+)-Clavularin A⁷Synthesis of enantiopure cyclopentenones⁸

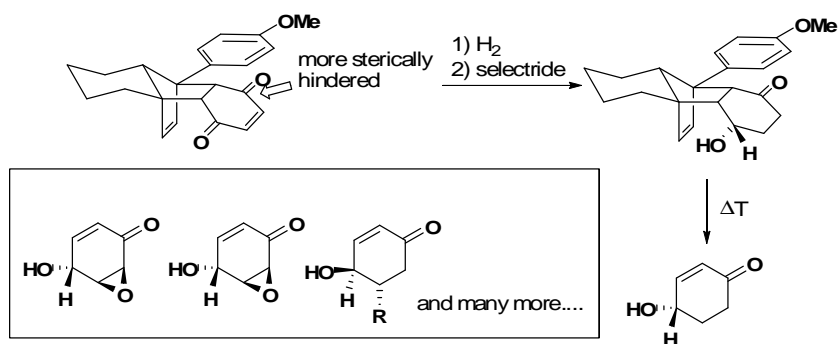
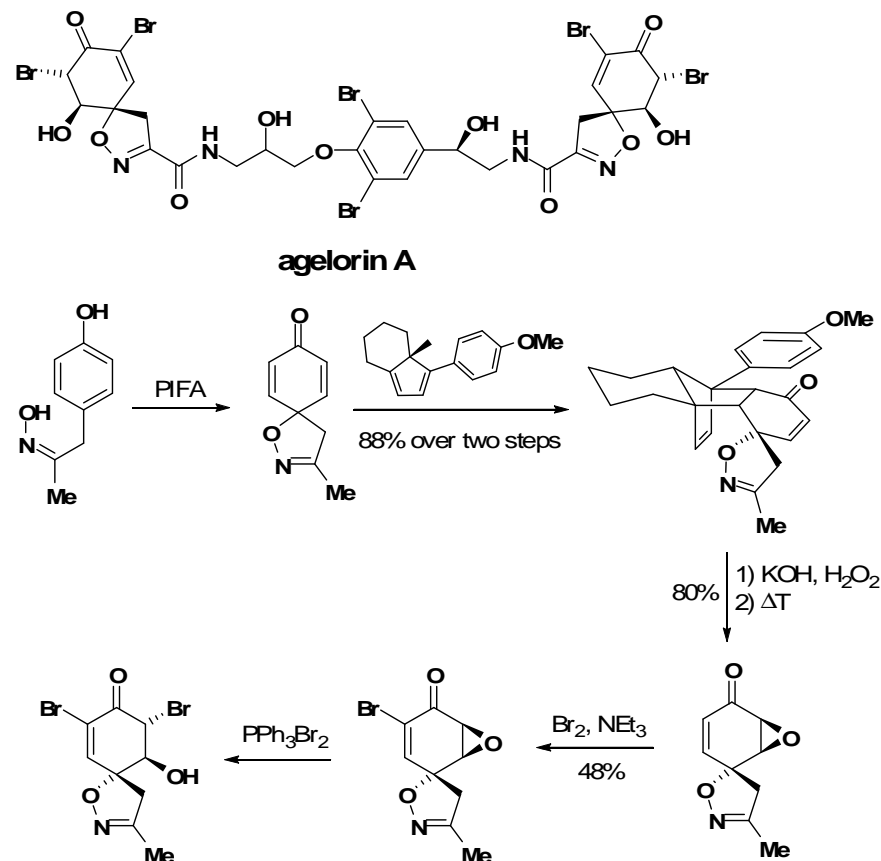
⁷ H. Weinmann, E. Winterfeldt, *Synthesis* **1995**, 1097-1101.

⁸ P. Riviere, A. Mauvais, E. Winterfeldt, *Tetrahedron Asymmetry* **1994**, 5, 9, 1831-1846.

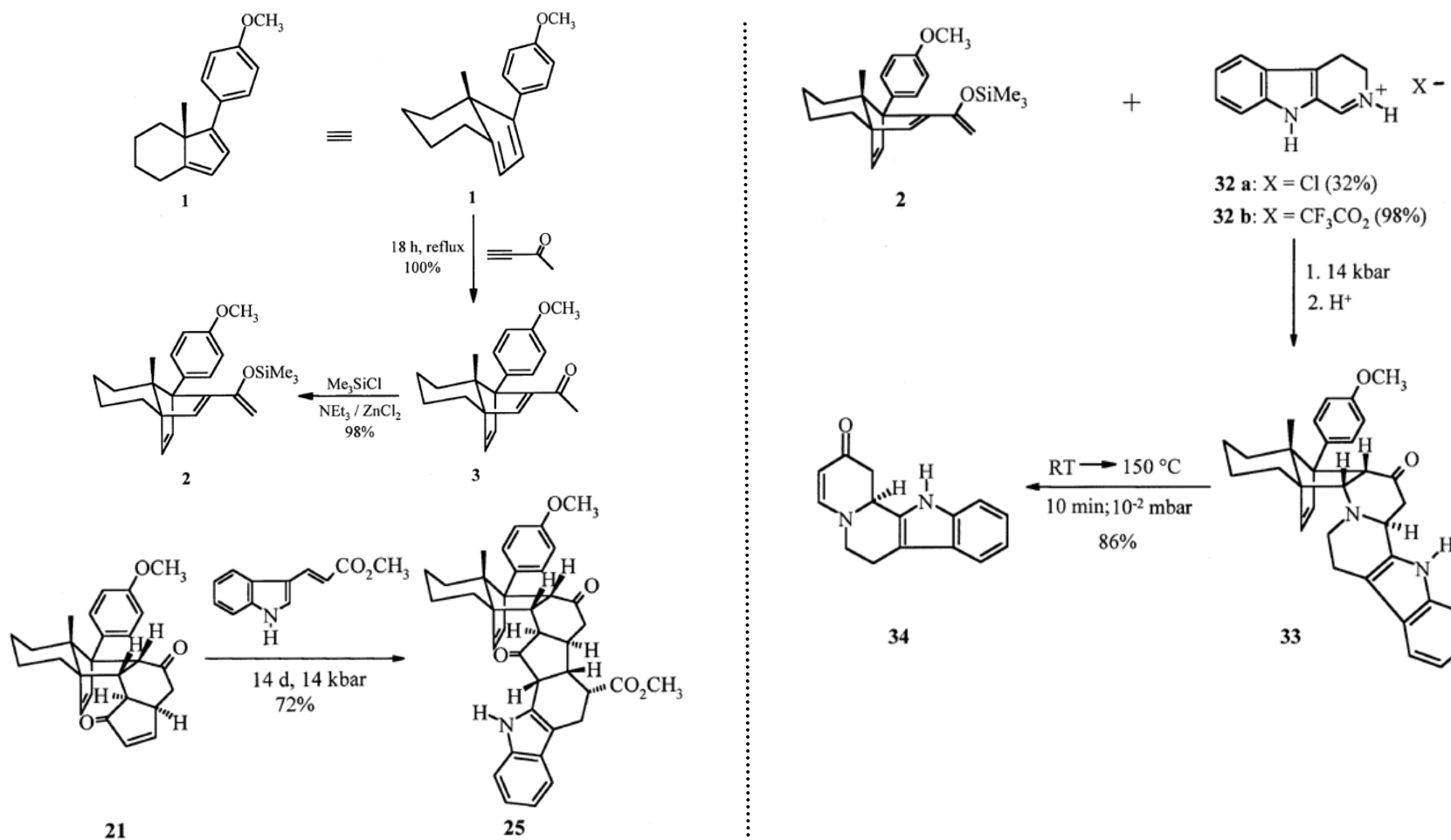
Diels-Alder Chemistry

Synthesis of enantiopure cyclohexenones⁹

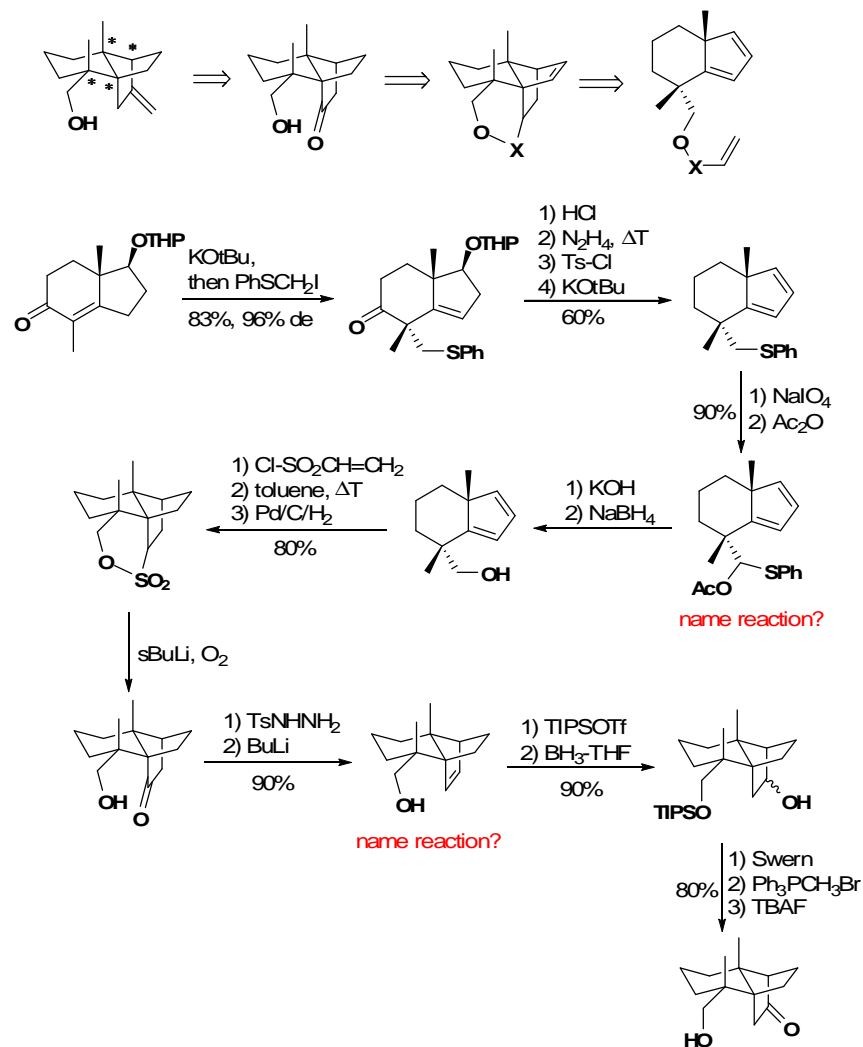
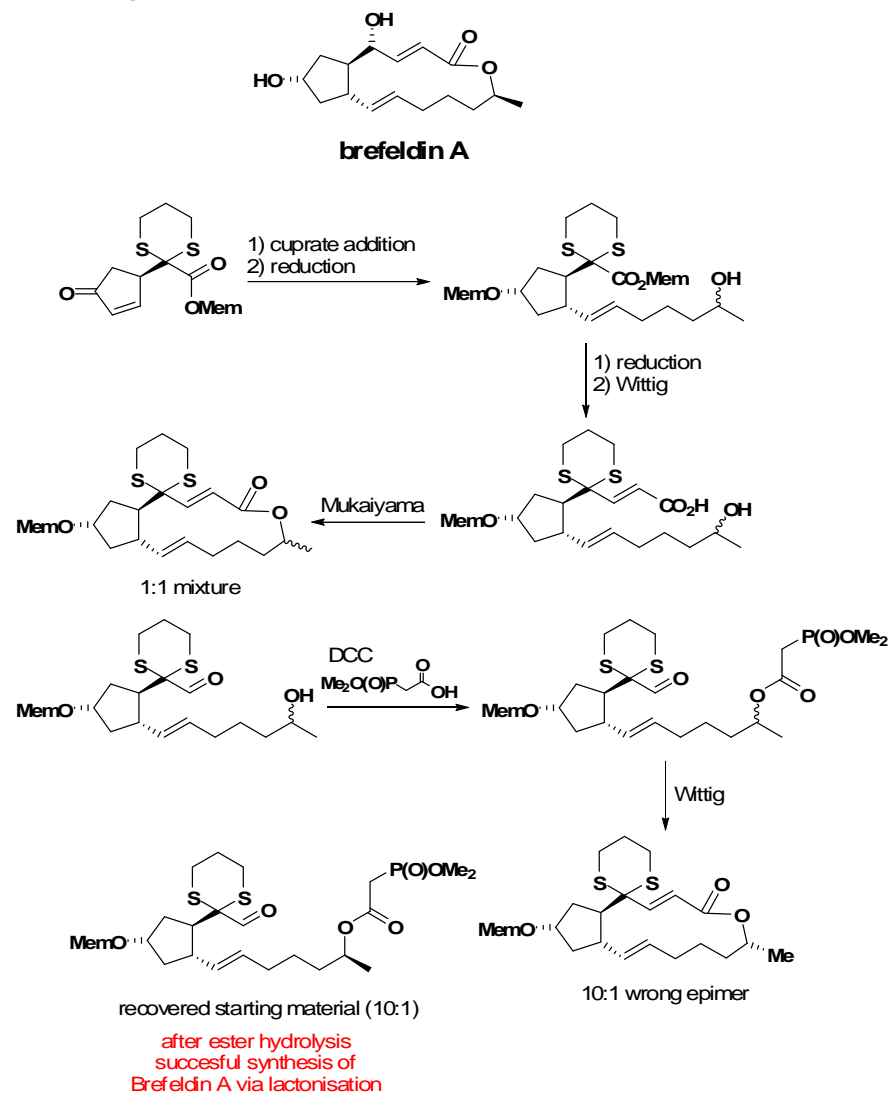
enantiopure cyclohexenones from simple benzoquinone

Application for the Synthesis of complex cyclohexenones¹⁰⁹ I. Gerstenberger, M. Hansen, A. Mauvais, R. Wartchow, E. Winterfeldt, *Eur. J. Org. Chem.* **1998**, 643-650.¹⁰ W. Beil, P. G. Jones, F. Nerenz, E. Winterfeldt, *Tetrahedron* **1998**, 54, 7273-7292.

Diels-Alder Chemistry

Enantiopure polycycles by sequential cycloadditions¹¹

¹¹ M. Wolter, C. Borm, E. Merten, R. Wartchow, E. Winterfeldt, *Eur. J. Org. Chem.* **2001**, 4051-4060.

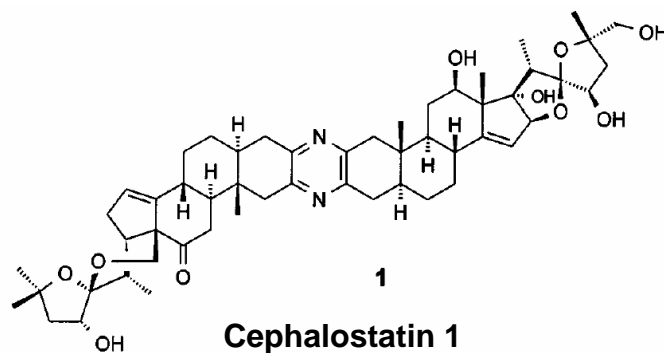
Enantioselective Synthesis of (-)-Myltaylenol¹²Investigations of the Brefeldin A cyclization¹³

¹² S. Doye, T. Hotopp, R. Wartchow, E. Winterfeldt, *Chem. Eur. J.* **1998**, 1480-1488.

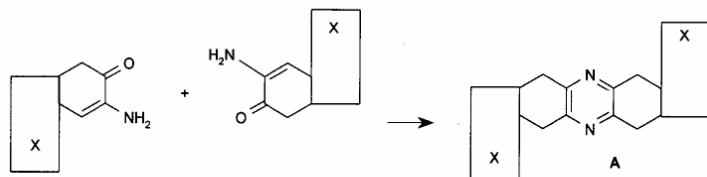
¹³ P. Raddatz, E. Winterfeldt, *Angew. Chem. Int. Ed.* **1981**, 286-287.

Synthesis of Cephalostatin Analogues¹⁴

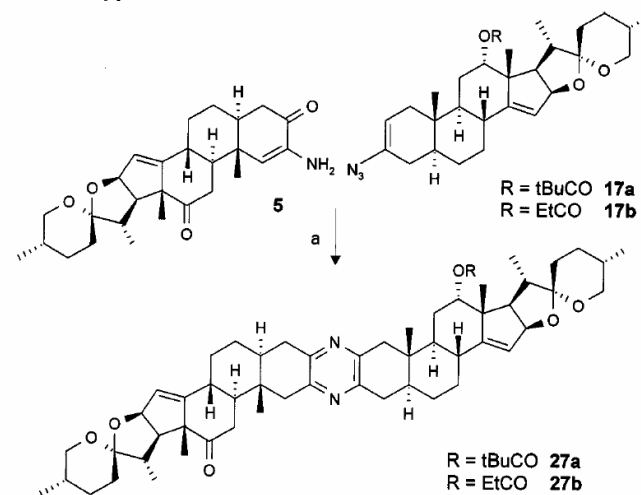
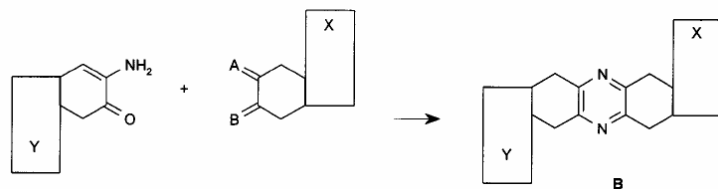
- isolated by Pettit out of the marine worm *Cephalodiscus gilchristi*
- strong cytostatic activity (400x stronger than Taxol)
- Limited bioavailability (139 mg out of 166 kg worm)



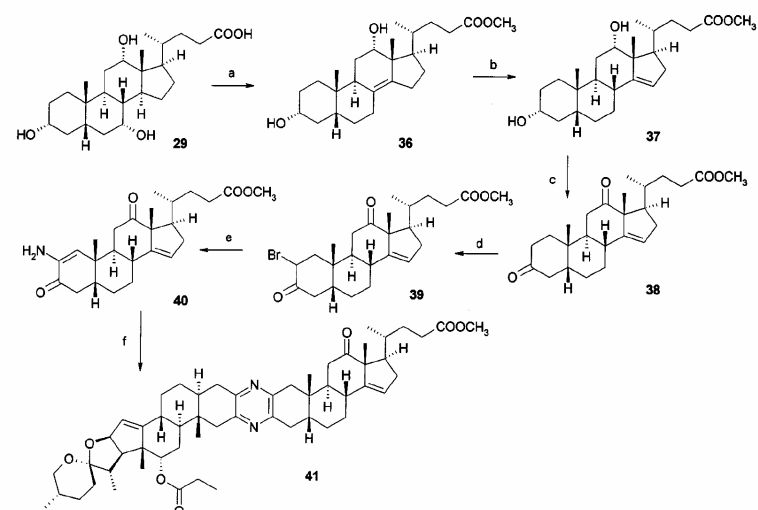
Symmetrical route: e.g. condensation of enaminoketones - regioselective but not substrate specific



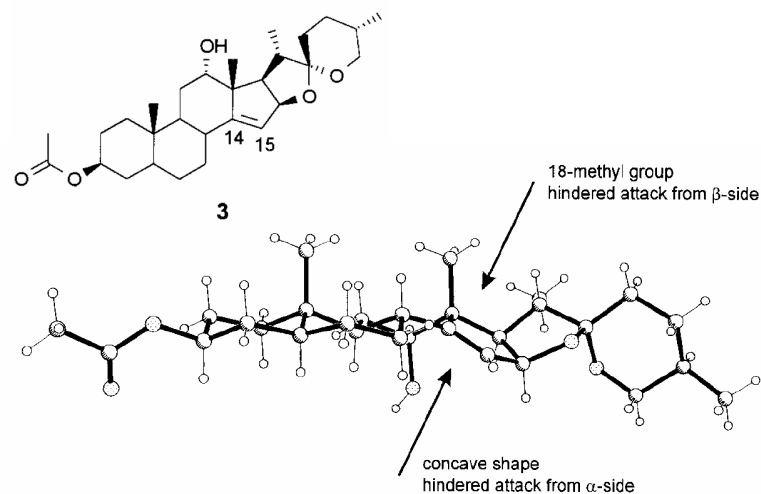
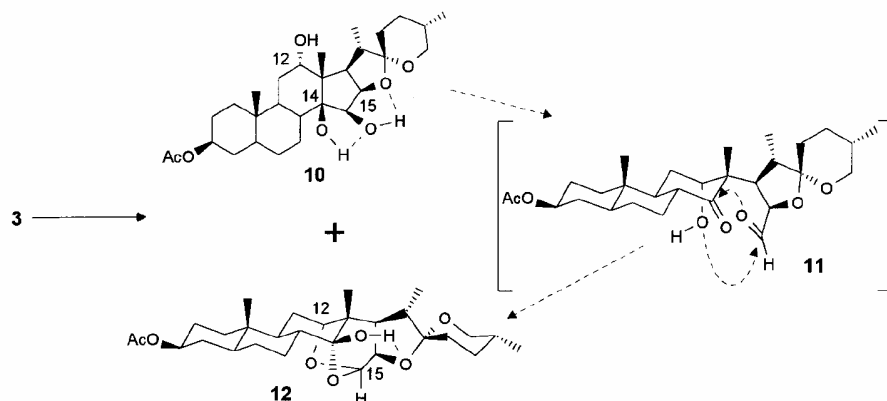
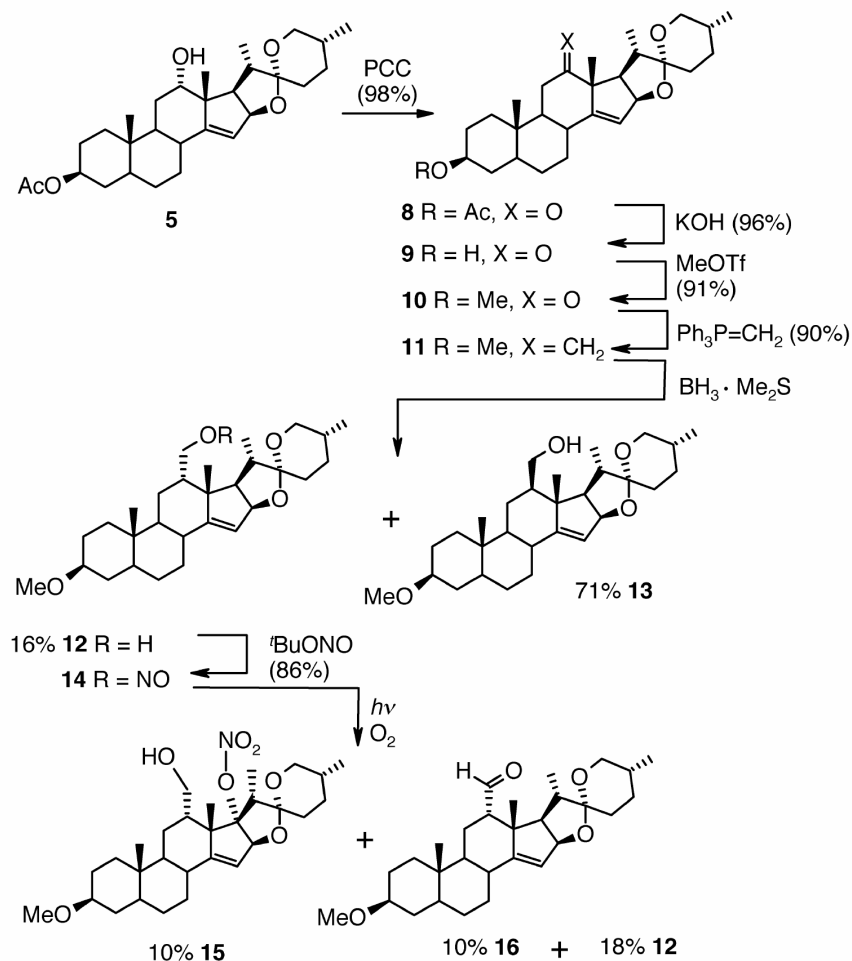
Non-symmetrical route: regioselective and substrate specific



Scheme 20



a) i. ZnCl_2 , acetone, 70°C , 3 h, 75%; ii. Amberlyst 15, methanol, r.t., 12 h, 99%. - b) HCl , chloroform, -78°C , 2 h, 55%. - c) PCC, silica gel, NaOAc , dichloromethane, r.t., 4 h, 81%. - d) PhSeBr , ethyl acetate, r.t., 9 d, 29% based on recovered starting material (50%). - e) NaN_3 , NaI , DMF, 65°C , 2 h, 81%. - f) PPTs, 3-Å molecular sieves, dioxane, reflux, 2.5 h, 30%.

Synthesis of Cephalostatin Analogues^{15,16}Figure 1. X-Ray structure of homoallylic alcohol **3**¹⁰ showing the hindered environment of the double bond.Scheme 2. Reaction of homoallylic alcohol **3** with ruthenium tetroxide: Conditions A: RuCl_3 (1 equiv), NaIO_4 (2.4 equiv), ethyl acetate/acetonitrile/water 4:4:1, 0°C, 10 h, 47% of **10** and 27% of **12**; conditions B: RuCl_3 (1 equiv), NaIO_4 (2.4 equiv), ethyl acetate/acetonitrile/water 4:4:1, 25°C, 21 h, 41% of **12**.Controlled oxidation of C_{17} ¹⁵ R. Jautelat, A. Müller-Farnow, E. Winterfeldt, *Chem. Eur. J.* **1999**, 1226-1233.¹⁶ S. Bäsler, A. Brunck, R. Jautelat, E. Winterfeldt, *Helv. Chim. Acta* **2000**, 1854-1880.