Tetrahedron Total Synthesis in the 1980s

(-)-Pentalenolactone E methyl ester, Douglass F. Taber, 1987, 43, 5677-5684.

(-)-Aphidicolin, John E. Mcmurry, 1981, 37, Supplement 1, 319-327.

History of Tetrahedron:
- Founded in 1958 with the help of Sir Robert Robinson and Robert Burns Woodward;
- Weekly peer-reviewed scientific journal;

Notable Events of Tetrahedron in the 1980s:
♦ The Tetrahedron Prize for Creativity in Organic Chemistry (established in 1980):
  1) intended to honour the memory of the founding co-Chairmen of Tetrahedron publications;
  2) prize winners in the 1980s: Albert Eschenmoser (1981); Elias J. Corey (1983);
♦ Most cited paper: Iterative partial equalization of orbital electronegativity-A rapid access to
♦ Authors with most publications: Kenji Mori(89), Jack E. Baldwin(50), Derek H.R. Barton(35)

(-)-emetine, Tozo Fujii, 1980, 36, 1539.

quinolizidine alkaloid


Bischler-Napieralski

a) 180 °C, neat, 80 min
   SM : Pdt = 33 : 67
   83% after three cycles or
b) 10% HCl, reflux, 20 h
   71% (SM : Pdt ratio not given) isomerization at C2

NaOH 96%
R = Et;
R = H;
1) Hg(OAc)₂-EDTA
   1% AcOH, reflux
   41% + oxid. at C₄: 35%
2) Pd/C, quant.

1) Trisyl azide
2) MeOH, hv
3) LiOH

37%

Another synthesis by R. E. Ireland, (JACS 1981, 103, 2446) covered in GM:
1) Herrmann (Robert E. Ireland)
2) Rodriguez (JACS review 1981)

1) 0.03% Sodium tert-pentoxide,
toluene, 220 °C, 60%;
2) LAH, 93%

1) LAH, 95%
2) ethyl vinyl ether,
Hg(OAc)₂, 90%

1) LAH, 95%
2) 4 steps

failed model study:

Mechanism?
**Tetrahedron Total Synthesis in the 1980s**


Prior communication: JACS, 1976, 98, 6723-6724.

For a recent synthesis by Nicolaou, see: JACS, 2012, 134, 17320-17332.


Another synthesis by M. C. Pirrung, (JACS 1981, 103, 82) covered in GM: Rodriguez (JACS review 1981); and Weidner (Triquinanes).
Tetrahedron Total Synthesis in the 1980s

(±)-Modephene and (±)-epimodephene, Leo A. Paquette, 1981, 37, 4431-4435.


For a similar strategy in the synthesis of isoamijiol, see GM by: Horn (Gerald Pattenden).


For the same synthetic strategy used in the synthesis of Ibogamine and other related alkaloids, see GM by: Chu (JOC review 1992).
Aspidosperma alkaloid framework, Mitsutaka Natsume, 1985, 41, 2115-2123.

Aspidosperma alkaloid framework

Aspidosperma alkaloid framework

Aspidosperma alkaloid framework


For recent reports on reverse prenylation at C3 position of indole, see:
1) JACS, 2014, 136, 16756-16759;
2) OL, 2007, 9, 283-286;

(-)-Norpatchoulenol, (-)-hydroxy patchouli alcohol, Kiyoyuki Yamada, 1987, 43, 825-834.

This key step also covered in GM by: Voica (Applications of Mn(III) in Organic Chemistry).
Tetrahedron Total Synthesis in the 1980s

Jinghan Gui

Baran Group Meeting
11/07/15


For a prior synthesis of Dihydroperiphylline by Wasserman, see: JACS 1981, 103, 461; also covered in GM: Rodriguez (JACS review 1981)

Spermidine alkaloids:
- cannabisativine
- anhydrocannabisativine

Required Z, E-dienone conformation for ring closure:

Spermidine alkaloids:
- cannabisativine
- anhydrocannabisativine

N-N H H N O

H OH OH

For its preparation, see JOC, 1980, 45, 1130-1135

Eupolauramine, Yasuo Kikugawa, 1989, 45, 1653-1660.

For a prior synthesis of Dihydroperiphylline by Wasserman, see: JACS 1981, 103, 461; also covered in GM: Rodriguez (JACS review 1981)

For reviews on vinblastine, see:
2) Tohru Fukuyama, Pure Appl. Chem., 2003, 75, 29

(+)-Steganacin

Atropisomerization
