PROBLEM 12

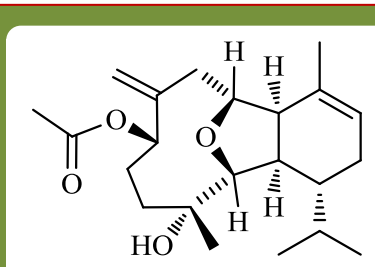
[SUPPL Problem 12 # 1]

Arabic compound numbers in TAPSOC,
Roman numerals in Supplementary material

In Perspective

This relatively simple problem from the mechanistic standpoint, depending on how you approach it, touches upon long standing efforts to gain access to a series of marine diterpenes, the eunicellins, isolated from corals of the Far East [1].

Among the 60 strong metabolites of this kind, (-)-7-deacetoxyalcyonin (**I**) is produced by Cladiella corals in 0.6% dry weight. This is a large amount for a single complex metabolite and calls for a considerable expenditure of biochemical energy. It seems logical that this compound should provide an ecologically advantageous service to Cladiella: several mollusks and fish species include corals in their diets so **I** may as well deter them. These compounds have entered the anti-tumor arena more recently [2].



I

(-)-7-deacetoxyalcyonin

FIGURE SP12.1

On the other hand, these eunicellin based diterpenoids are effective inhibitors of prostate cancerous cells. Given that prostate cancer is one of the most prevailing male

cancers the world over, efforts in this direction are bound to have a tremendous impact in people's health.

As there is an obvious structural relationship between **2** (TAPSOC) and **I** (here), the reaction above, developed at professor Mark Elliott at Cardiff University in the UK, is a key step in acquiring the peculiar stereochemistry of the four asymmetric centers of the tricyclic scaffold of eunicellins in just one pot operation. For mechanism design this demands consideration of the stereochemical control.

REFERENCES

[1] MacMillan DWC, Overman LE. J. Am. Chem. Soc. 1995;117:10391-10392

[2] Hassan HM, Alnagar AY, Khanfar MA, Sallam AA, Mohammed R, Shaala LA, Youssef DTA, Hifnawy MS, El Sayed KA. Eur. J. Med. Chem. 2011;46:1122-1130.