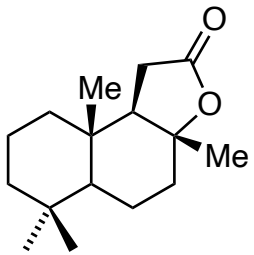
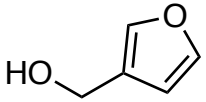
Concise Chemoselective Synthesis of Gedunin

Li, J., Chen, F., Renata, H. *J. Am. Chem. Soc.* **2022**, *144*, 19238-19242.



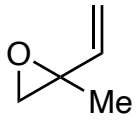
1-4

A



5-8

1) MeLi, TFAA, H_2O_2
2) $SOCl_2$, pyridine
3) O_3, DMS, *then* DBU
4) MERO 1 L437A



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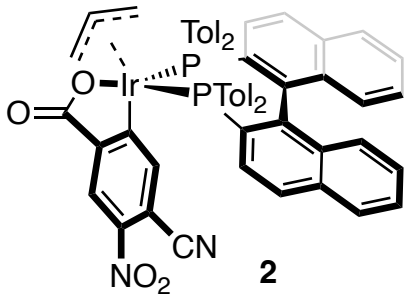


2

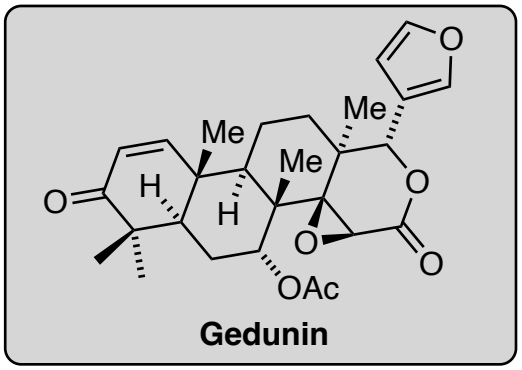
5) **1**, **2** (5 mol%), K_3PO_4

1) Name of starting material?
Sclareolide

4) Hint: Enzymatic regio- and stereoselective functionalization on the C3 position resulting in an IR stretch at 3300-3600 cm^{-1}.

4) What type of enzyme do you think this is?
Cytochrome P_{450}

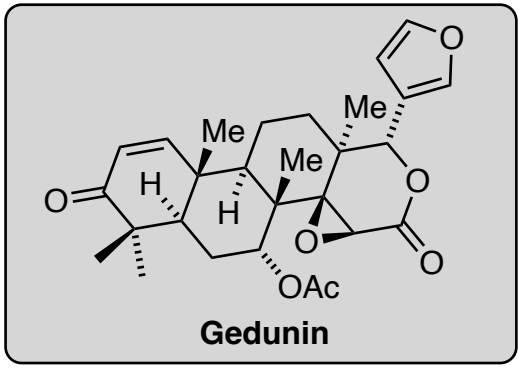
5) Name of reaction? Hint: reaction is diastereo-and enantio-selective
Krische allylation



Gedunin

B

9-17



Gedunin

6) TMSCl, NEt_3, *then* acryloyl chloride, *then* citric acid, MeOH
7) HG-II
8) I_2, PPh_3, imidazole

9) **A**, Zn, CuI, sonication
10) tBuOK, $MePPh_3Br$
11) DMP
12) SeO_2, TBHP
13) $Fe(acac)_3$, $PhSiH_3$
14) LDA, TMSCl
15) $Pd(OAc)_2$, O_2; HF quench
16) Ac_2O, NEt_3
17) *m*CPBA

6) Hint: an *in situ* protection and deprotection occur on the more reactive alcohol.

9) Who came up with these conditions?
Luche

12) Name of reaction?
Riley

12) Hint: 0.5 equiv. of SeO_2

13) Name of reaction?
Giese

14) Hint: 10 equiv. of TMSCl and 4 equiv. of LDA.

15) Name of reaction?
Saegusa oxidation

17) Rationalize the chemo-and diastereo-selectivity observed.
The authors suggest the D-ring selectivity over the a-ring enone was due to sterics. The facial selectivity was justified as the avoidance of undersirable lone pair-lone pair repulsion from the -OAc group. Thus *m*CPBA epoxidizes the beta face.