Total Synthesis of the Euphorbia Diterpenoid Pepluacetal

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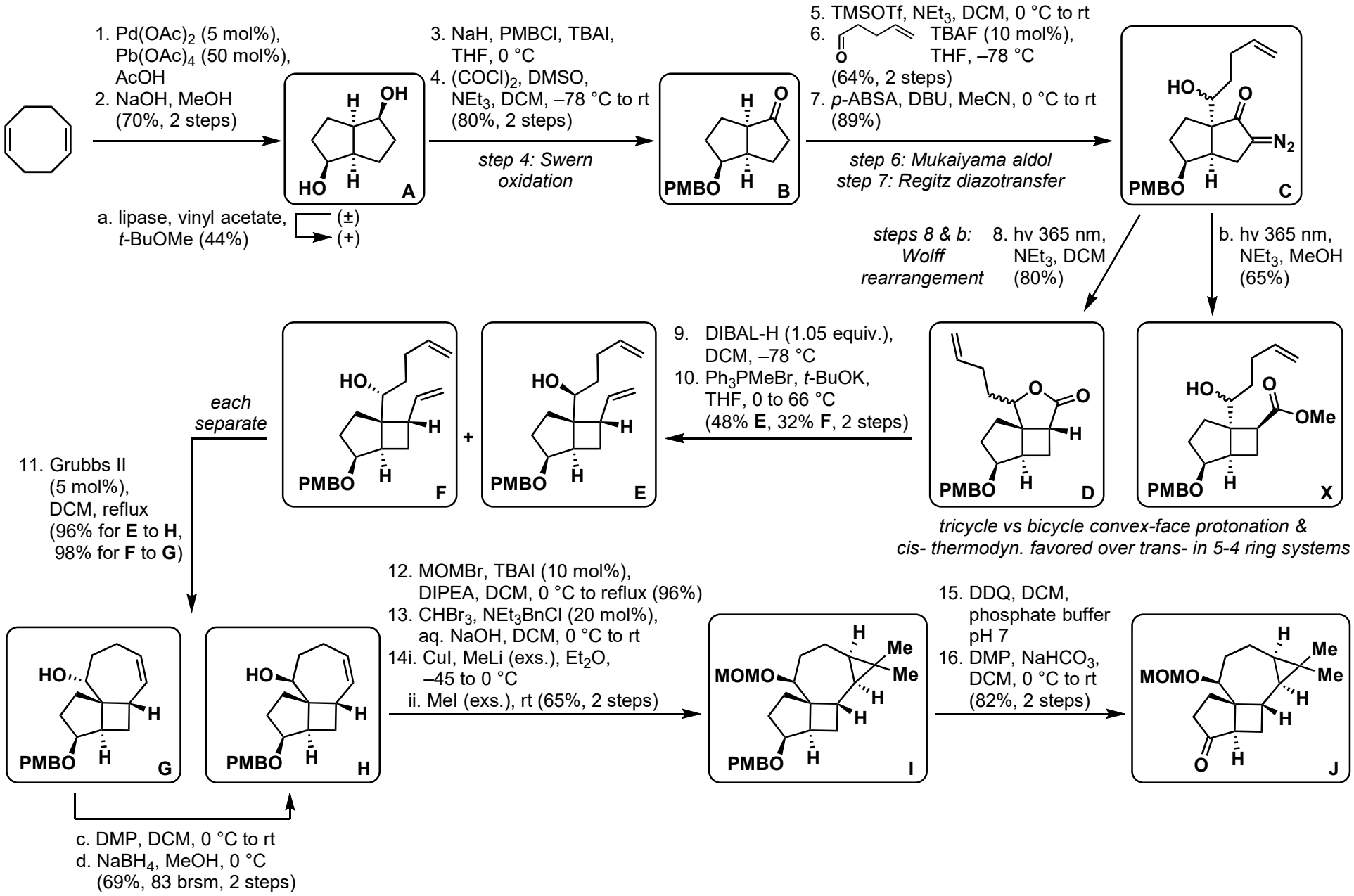
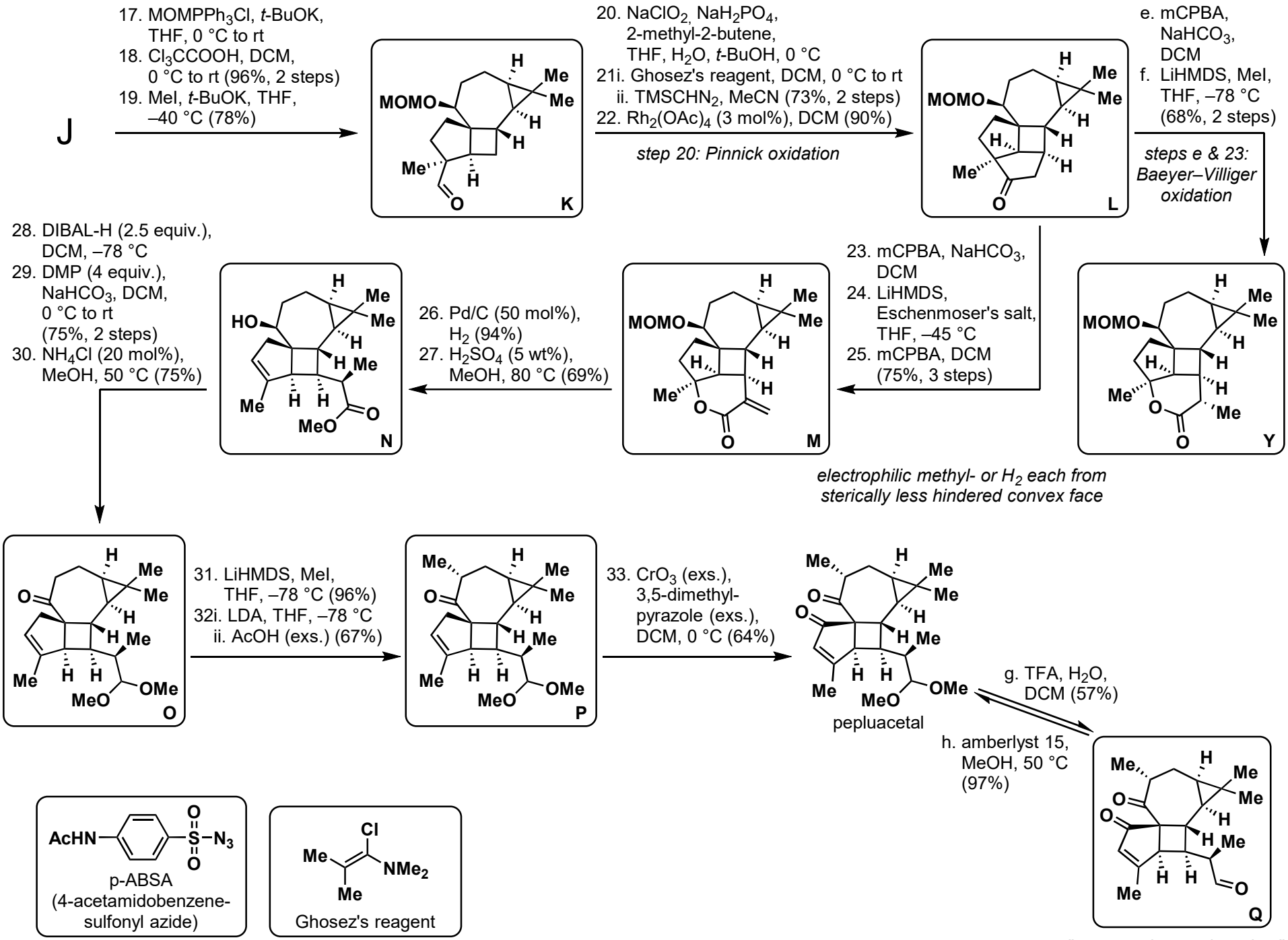
Angew. Chem. Int. Ed. **2024**, e202400943. 10.1002/anie.202400943




J
17. MOMPPh3Cl, t-BuOK, THF, 0 °C to rt
18. Cl3CCOOH, DCM, 0 °C to rt (96%, 2 steps)
19. MeI, t-BuOK, THF, –40 °C (78%)
K
20. NaClO2, NaH2PO4, 2-methyl-2-butene, THF, H2O, t-BuOH, 0 °C
21i. Ghosez's reagent, DCM, 0 °C to rt
ii. TMSCHN2, MeCN (73%, 2 steps)
22. Rh2(OAc)4 (3 mol%), DCM (90%)
step 20: Pinnick oxidation
L
e. mCPBA, NaHCO3, DCM
f. LiHMDS, MeI, THF, –78 °C (68%, 2 steps)
steps e & 23: Baeyer–Villiger oxidation
Y
23. mCPBA, NaHCO3, DCM
24. LiHMDS, Eschenmoser's salt, THF, –45 °C
25. mCPBA, DCM (75%, 3 steps)
M
26. Pd/C (50 mol%), H2 (94%)
27. H2SO4 (5 wt%), MeOH, 80 °C (69%)
N
28. DIBAL-H (2.5 equiv.), DCM, –78 °C
29. DMP (4 equiv.), NaHCO3, DCM, 0 °C to rt (75%, 2 steps)
30. NH4Cl (20 mol%), MeOH, 50 °C (75%)
electrophilic methyl- or H2 each from sterically less hindered convex face
O
31. LiHMDS, MeI, THF, –78 °C (96%)
32i. LDA, THF, –78 °C
ii. AcOH (exs.) (67%)
P
33. CrO3 (exs.), 3,5-dimethyl-pyrazole (exs.), DCM, 0 °C (64%)
pepluacetal
g. TFA, H2O, DCM (57%)
h. amberlyst 15, MeOH, 50 °C (97%)
Q
"presumed natural product"
p-ABSA (4-acetamidobenzene-sulfonyl azide)
Ghosez's reagent