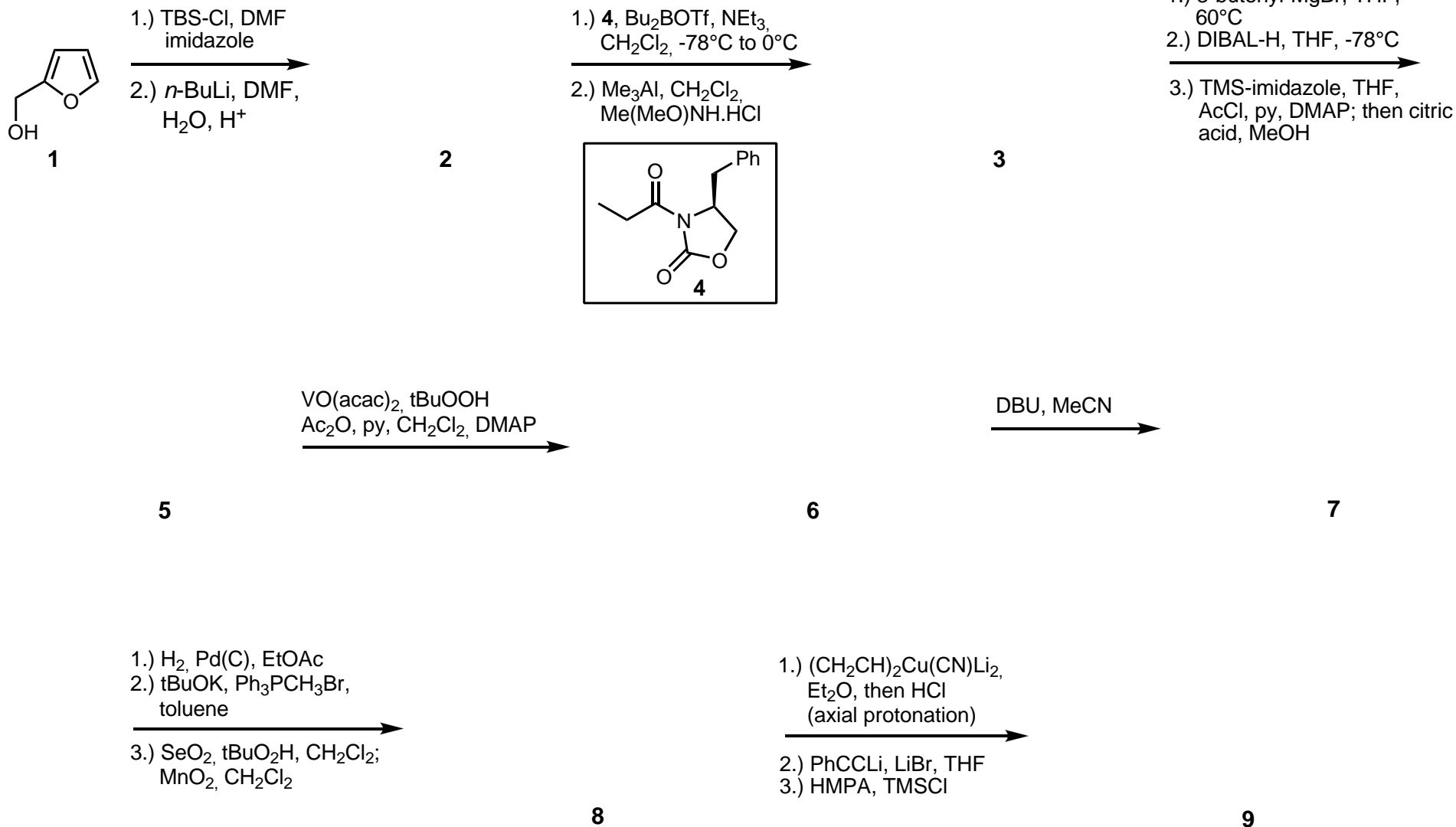


# Total Synthesis of Phorbol

Denksport Rita Fürst  
28.05.2009



1.)  $\text{Cp}_2\text{ZrCl}_2$ , *n*BuLi,  
THF; HOAc



10

PCC,  $\text{CH}_2\text{Cl}_2$ ,  
NaOAc



11

1.) LDA, THF,  $-78^\circ\text{C}$ , TMS-Cl  
2.) PhSCl,  $\text{CH}_2\text{Cl}_2$ ,  $-78^\circ\text{C}$   
3.)  $\text{Pb}(\text{OAc})_4$ , PhH  
4.) *m*-CPBA,  $\text{CH}_2\text{Cl}_2$



5.)  $\text{P}(\text{OEt})_3$ , PhH  
6.)  $\text{Ph}_2\text{S}=\text{C}(\text{CH}_3)_2$ ,  $\text{CH}_2\text{Cl}_2$

12

1.) HF (49%), MeCN,  $0^\circ\text{C}$   
2.)  $\text{O}_3$ ,  $\text{CH}_2\text{Cl}_2$ , MeOH,  $-78^\circ\text{C}$   
( $\text{NH}_2$ )<sub>2</sub>C=S



3.)  $\text{Tf}_2\text{O}$ , py,  $\text{CH}_2\text{Cl}_2$ ,  $0^\circ\text{C}$   
4.)  $n\text{Bu}_4\text{NI}$ , MeCN

13

Zn, EtOH,  $80^\circ\text{C}$



14

1.)  $\text{SeO}_2$ , *t*BuOOH,  $\text{CH}_2\text{Cl}_2$   
2.)  $\text{SOCl}_2$ , py, Et<sub>2</sub>O,  $0^\circ\text{C}$



3.) KOAc, 18-crown-6, AgOAc  
MeCN

15

1.) NaBH(OAc)<sub>3</sub>, THF  
2.) Ac<sub>2</sub>O, DMAP, py  
CH<sub>2</sub>Cl<sub>2</sub>



1.) MSTFA, DMAP, DABCO  
MeCN, 100°C  
2.) NBS, THF

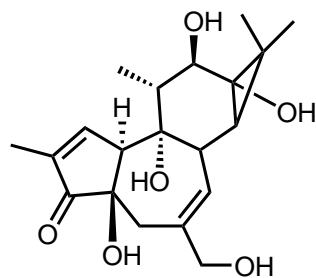
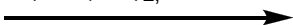


3.) Li<sub>2</sub>CO<sub>3</sub>, LiBr, DMF, 130°C

**16**

**17**

1.) TBAF, THF, -20°C  
2.) Ba(OH)<sub>2</sub>, MeOH



Phorbol

**18**

MSTFA=N-Methyl-N-trimethylsilyl trifluoroacetamid