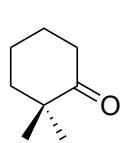


# Total Synthesis of (-)-Oridonin

L. Kong, F. Su, H. Yu, Z. Jiang, Y. Lu, T. Luo, *J. Am. Chem. Soc.* 2019, 141, 20048-20052

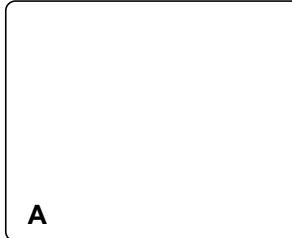
Gademann Group  
Josep Mas-Roselló  
11.10.22



1)  $\text{PBr}_3$ , DMF  
2)  $\text{NaH}_2\text{PO}_4$ ,  $\text{H}_2\text{O}_2$ ,  $\text{NaClO}_2$ (aq.)  
3)  $\text{K}_2\text{CO}_3$ , MeI

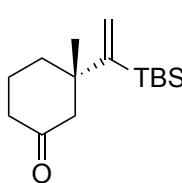
1) **60%**, 2-3) **67%**

Mechanism of 1), names 1) and 2)



4)  $\text{CrO}_3$ , AcOH  
5) (S)-CBS,  $\text{BH}_3\text{-SMe}_2$   
(2 eq. needed), THF,  $-40^\circ\text{C}$   
6) NaH (>2 eq.), BnBr (>2 eq.)

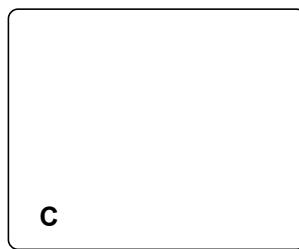
4) **45%**, 5) **85%**, >**98% ee**;  
6) **67%**



7) ICl, HFIP,  $40^\circ\text{C}$   
8)  $\text{Pd}(\text{MeCN})_2\text{Cl}_2$  cat.,  
 $\text{TMS}-\text{CH}_2-\text{ZnBr}$

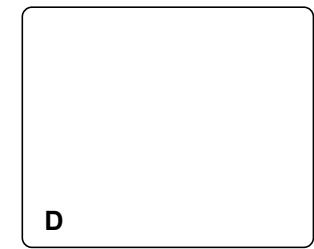
7) **73%**, 8) **76%**

Mechanism of 7), name of 8)



9) NaHMDS, Comins' reagent  
10)  $\text{Pd}(\text{OAc})_2$  cat.,  $\text{PPh}_3$  cat.  
 $\text{CO}$ ,  $\text{Et}_3\text{N}$ ,  $\text{MeOH}$ ,  
11) n-BuLi, MeNHOME  
12) DIBAL-H, THF,  $-78^\circ\text{C}$

9-10) **63%**, 11-12) **70%**



13)  $t\text{BuLi}$ ; then **D**  
14) PDC  
15)  $\text{EtAlCl}_2$

**13-14) 61%**

Stereochemistry & names  
for cascade 15)

**E**

16) TPP,  $\text{O}_2$ ;  
then  $\text{Ac}_2\text{O}$ , pyr

**15-16) 43%**

**F**

17)  $\text{RhCl}(\text{PPh}_3)_3$   
 $\text{PhCH}_3$ , reflux  
18) vinyl-lithium  
19) *m*CPBA (1 eq.)  
20) NBS

17) **67%**, 18-19) **70%**  
20) **89%**

**G**

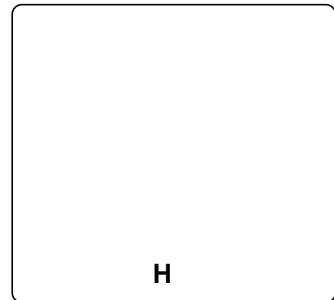
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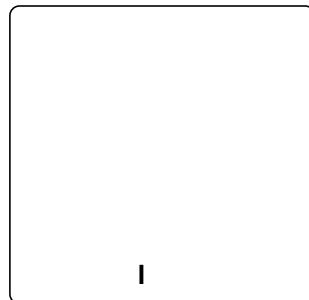
21)  $\text{RuCl}_3$ ,  $\text{NaO}_4$ ;  
then DBU  
22)  $\text{OsO}_4$  cat., NMO  
23)  $\text{EtAlCl}_2$

21-22) 70%, 23) 57%



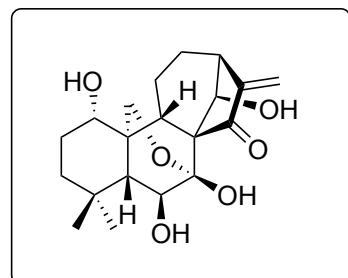
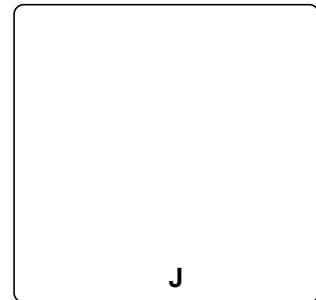
24)  $\text{LiAlH}_4$   
3 eq. needed  
25)  $\text{NaO}_4$

24-25) 69%

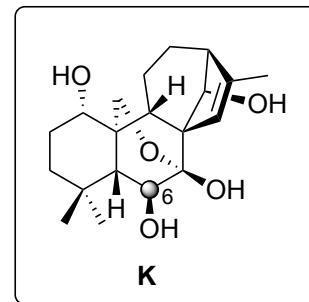


26) PTSA,  
 $\text{Me}_2\text{C}(\text{OMe})_2$ ;  
then DMP

66%



Conditions?



27) DIBAL-H;  
then Red-Al;  
then HCl

56% (+21% C6-epi-K)