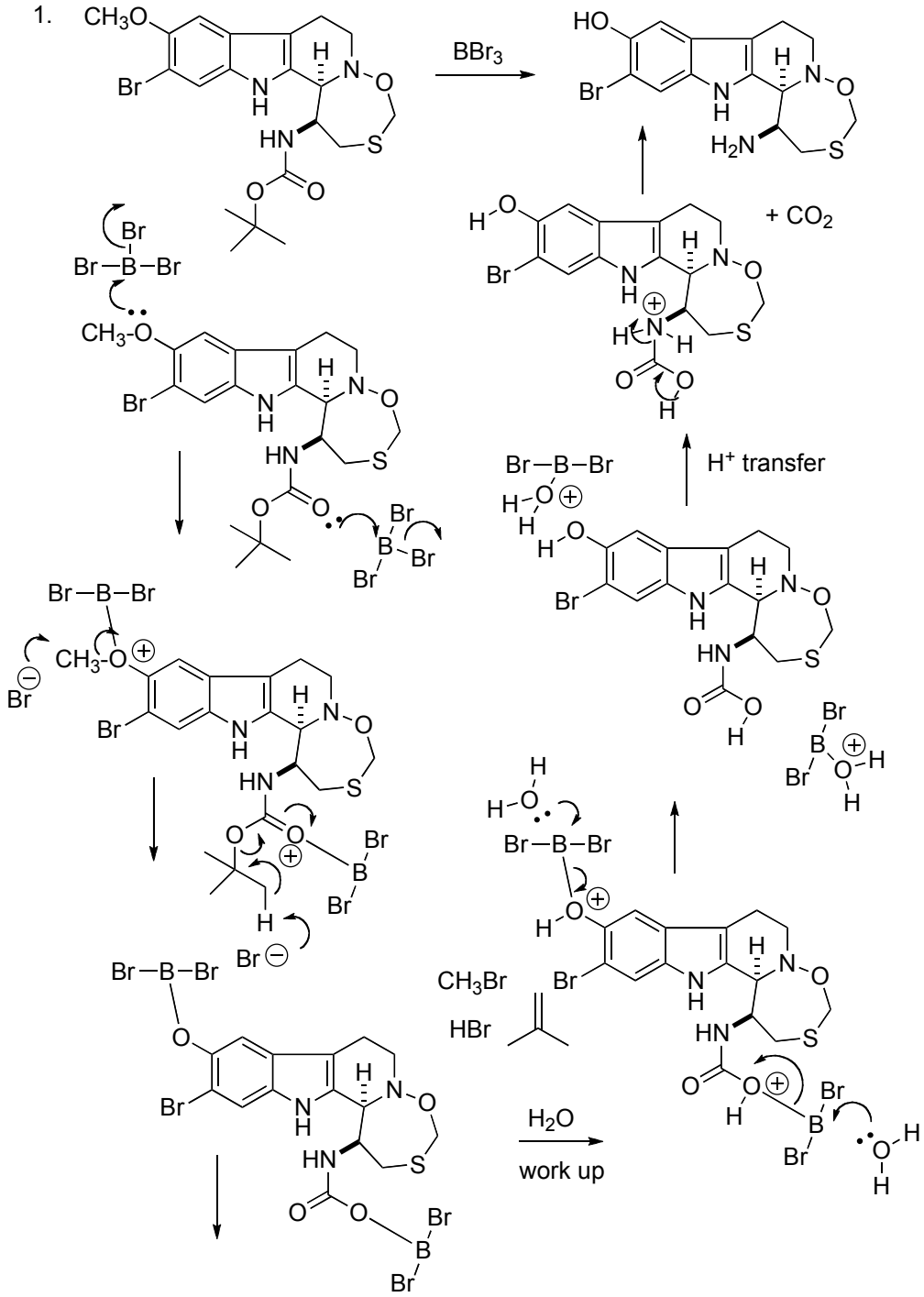
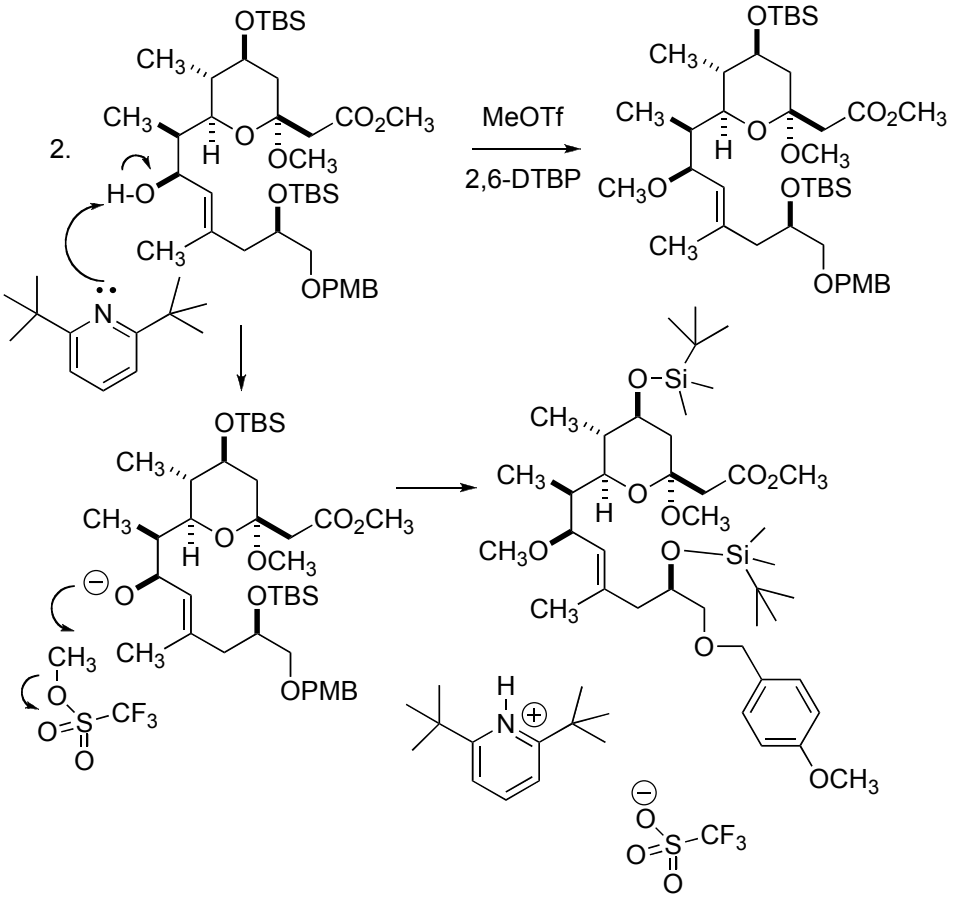
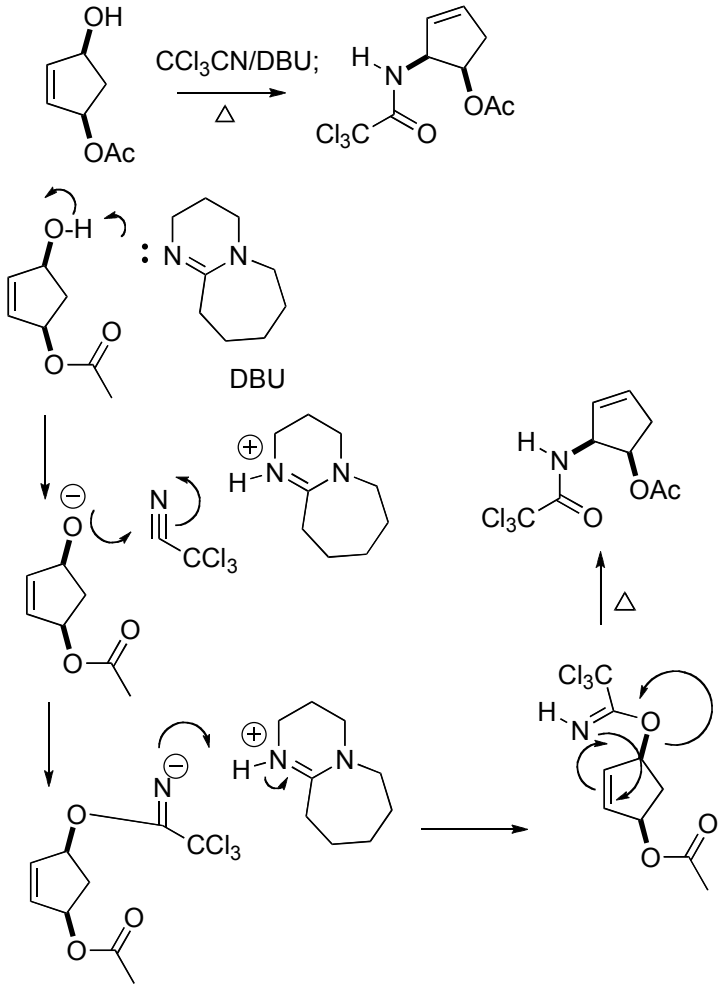
1.

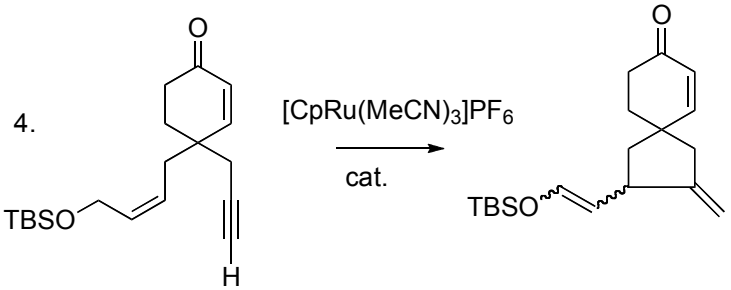


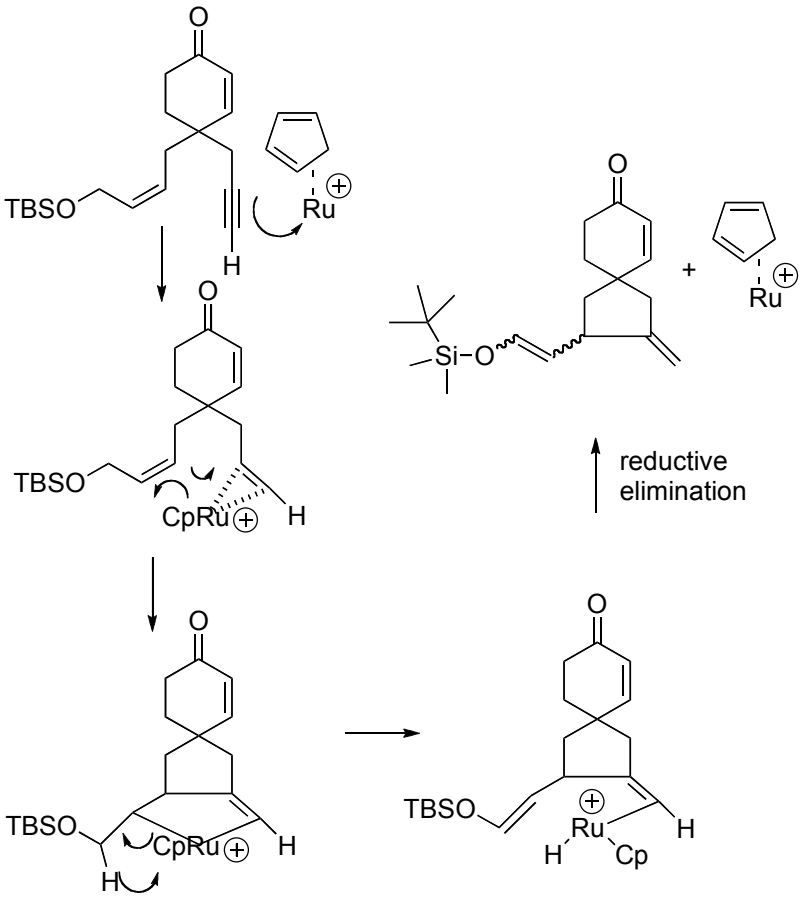

2.
MeOTf
2,6-DTBP
OTBS
CH3
CO2CH3
OCH3
H
H-O
OPMB
N
CH3O
O-Si
O
S
CF3

3.

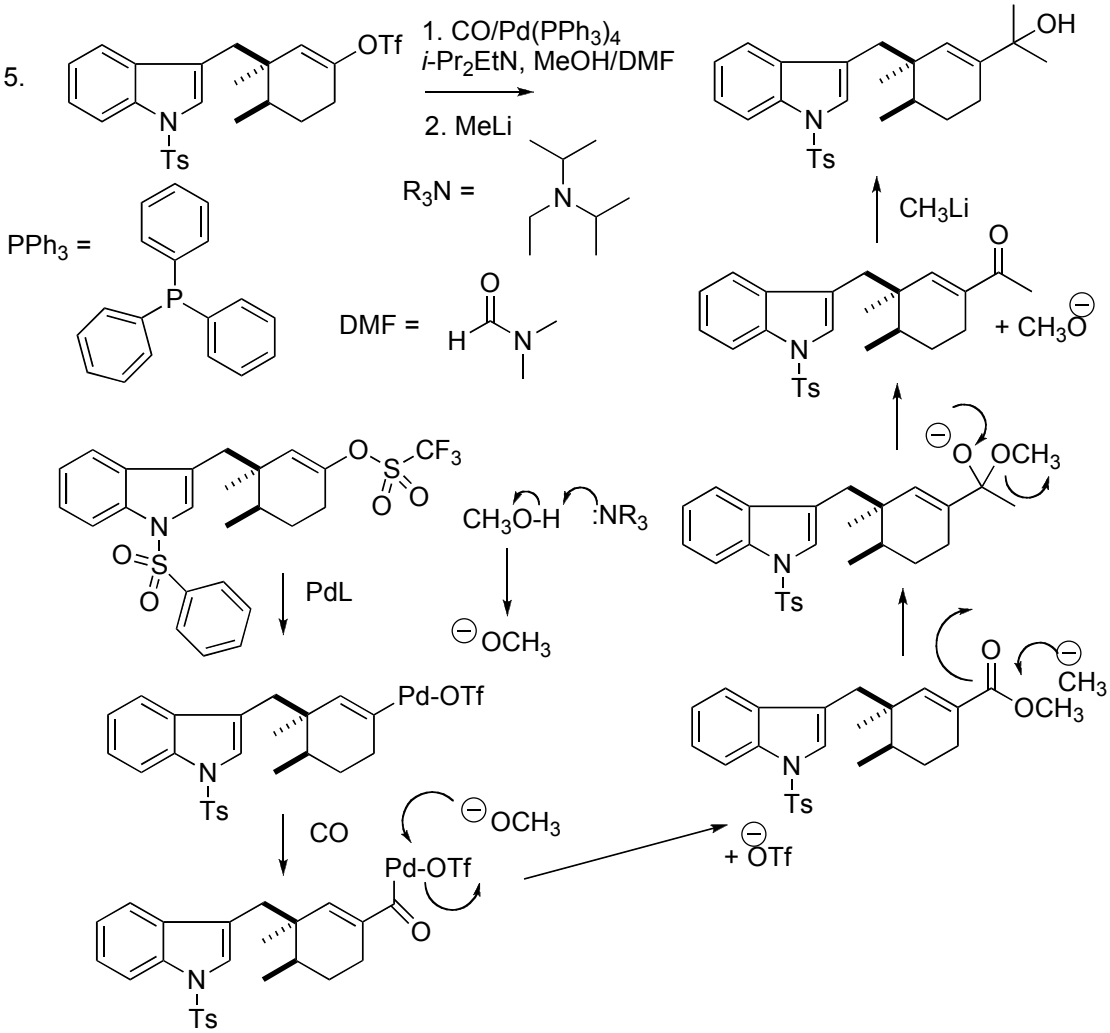

OH
OAc
CCl3CN/DBU;
△
H
N
OAc
Cl3C
O
O-H
N
N
O
O
DBU
H
N
N
N
CCl3
O
O
O
O
H
N
OAc
Cl3C
O
△
Cl3C
H
N
O
H
N
N
N
CCl3
O
O
O
O

4.


O
TBSO
H
[CpRu(MeCN)3]PF6
cat.
O
TBSO


O
TBSO
Ru
H
O
TBSO
CpRu
H
O
TBSO
CpRu
H
H
O
TBSO
Ru
H
H
Cp
O
Si–O
+
Ru
reductive
elimination

5.


OTf
1. CO/Pd(PPh3)4
i-Pr2EtN, MeOH/DMF
2. MeLi
OH
N
Ts
R3N =
PPh3 =
P
DMF =
H
O
CH3Li
+ CH3O
CF3
CH3O-H
:NR3
OCH3
PdL
Pd-OTf
CO
+ OTf
CH3