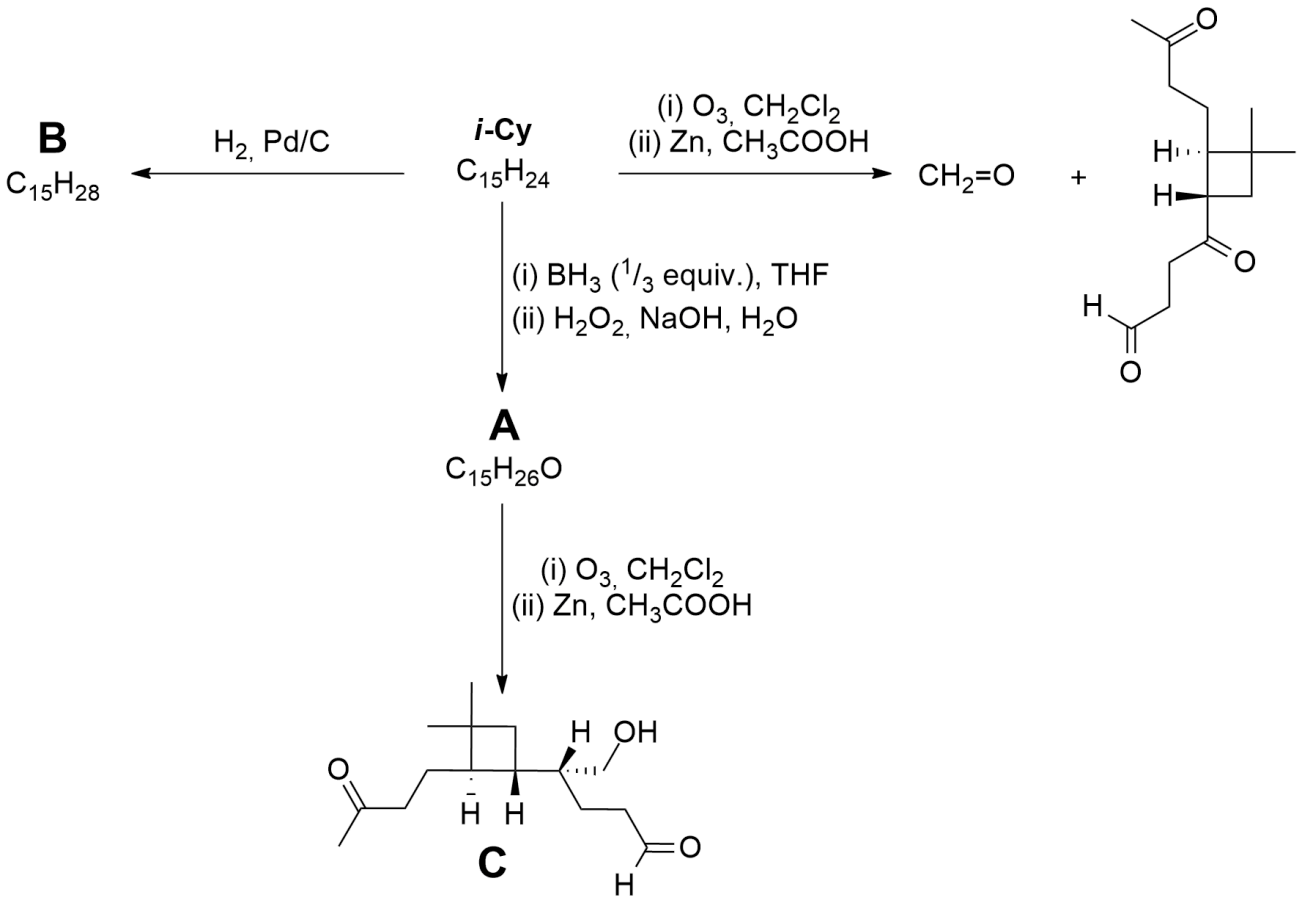
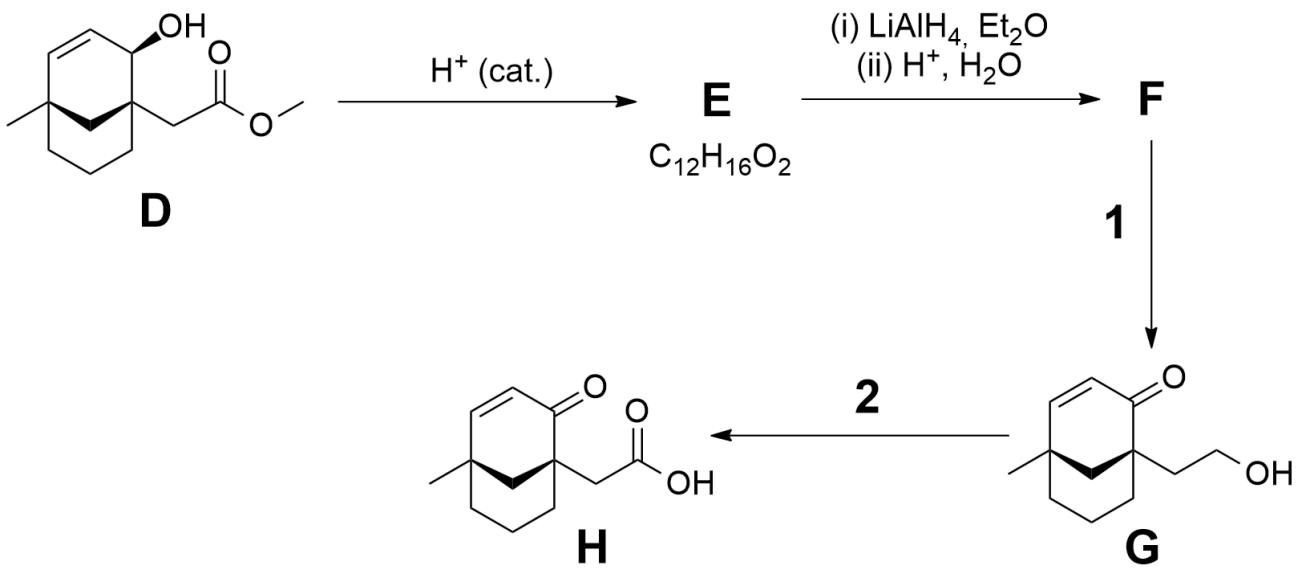
IChO 2025

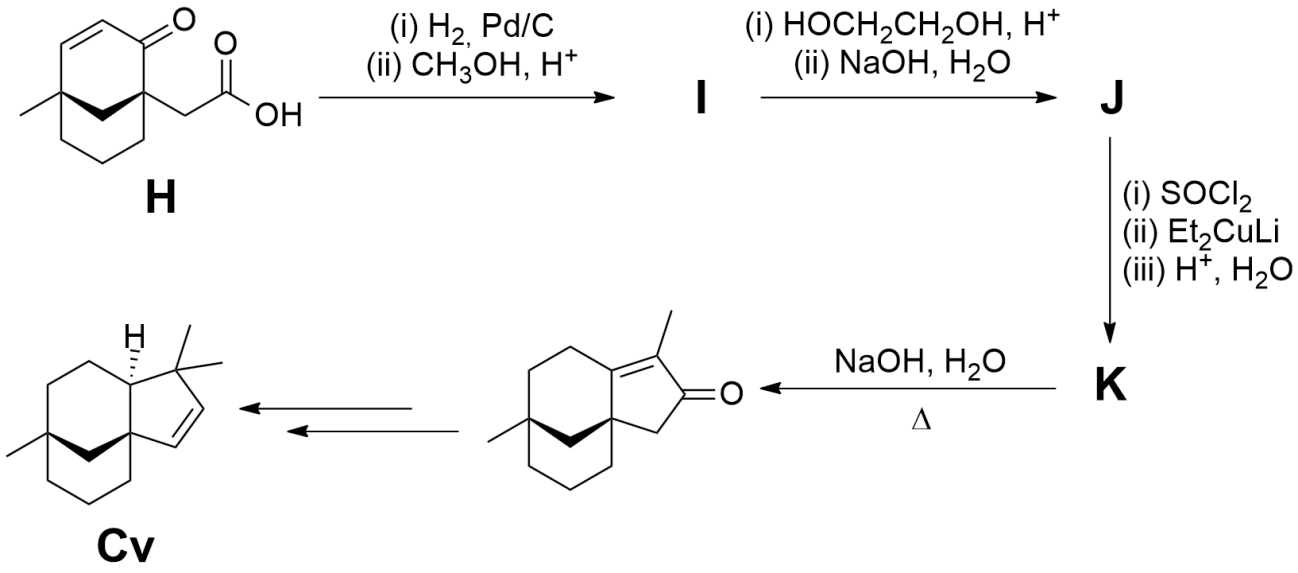
Theory Schemes Booklet

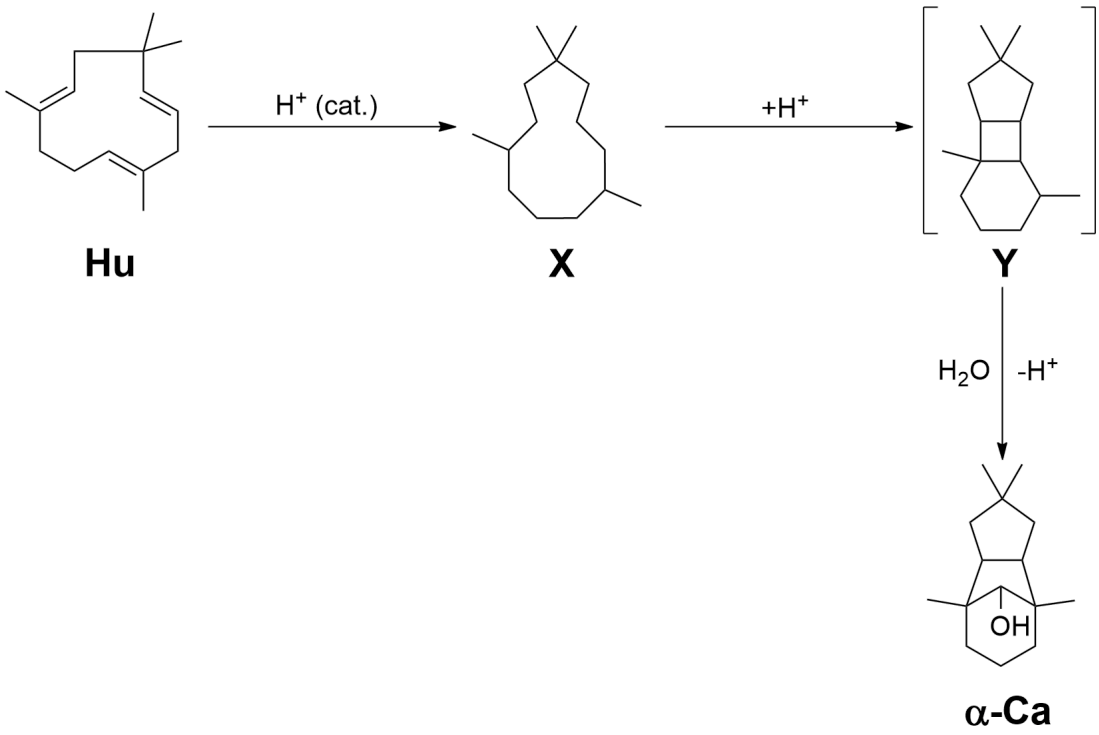
Nothing written in this booklet will be marked.

Q1

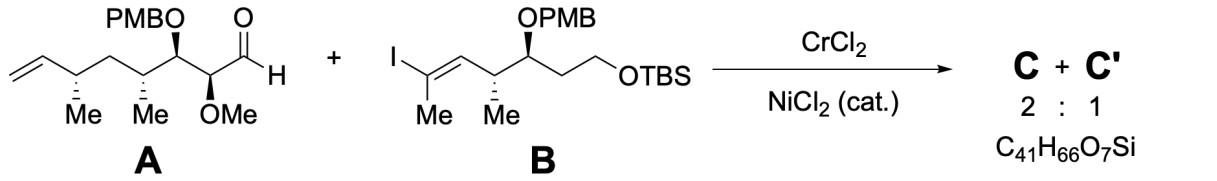

B
C15H28
H2, Pd/C
i-Cy
C15H24
(i) O3, CH2Cl2
(ii) Zn, CH3COOH
CH2=O
+
O
H
H
O
H
O
(i) BH3 (1/3 equiv.), THF
(ii) H2O2, NaOH, H2O
A
C15H26O
(i) O3, CH2Cl2
(ii) Zn, CH3COOH
H
OH
O
H
H
C
O
H

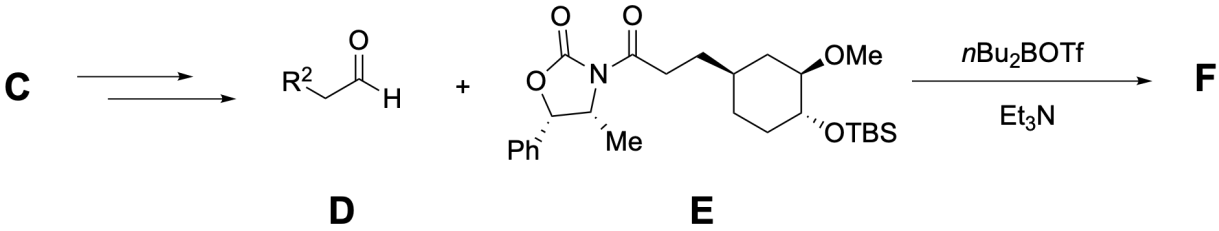

OH
O
O
D
H+ (cat.)
E
C12H16O2
(i) LiAlH4, Et2O
(ii) H+, H2O
F
1
O
OH
G
2
O
O
OH
H

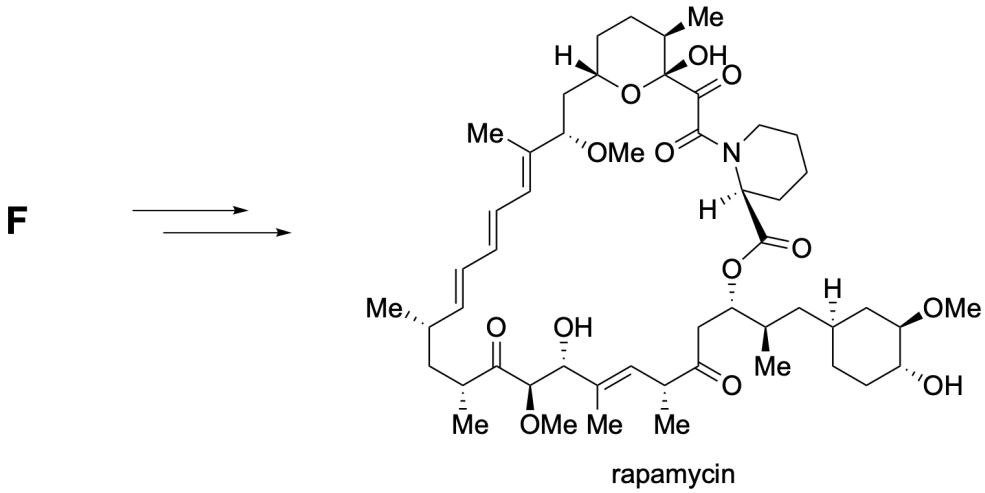

O
O
OH
H
(i) H2, Pd/C
(ii) CH3OH, H+
I
(i) HOCH2CH2OH, H+
(ii) NaOH, H2O
J
(i) SOCl2
(ii) Et2CuLi
(iii) H+, H2O
K
NaOH, H2O
Δ
O
H
Cv


H+ (cat.)
+H+
Hu
X
Y
H2O
-H+
OH
α-Ca

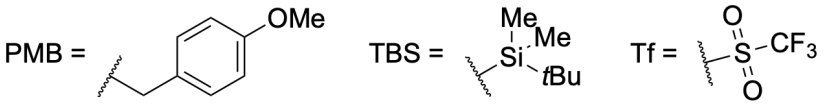
Q2

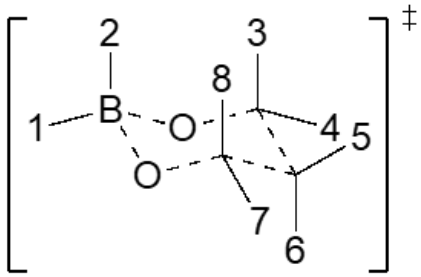


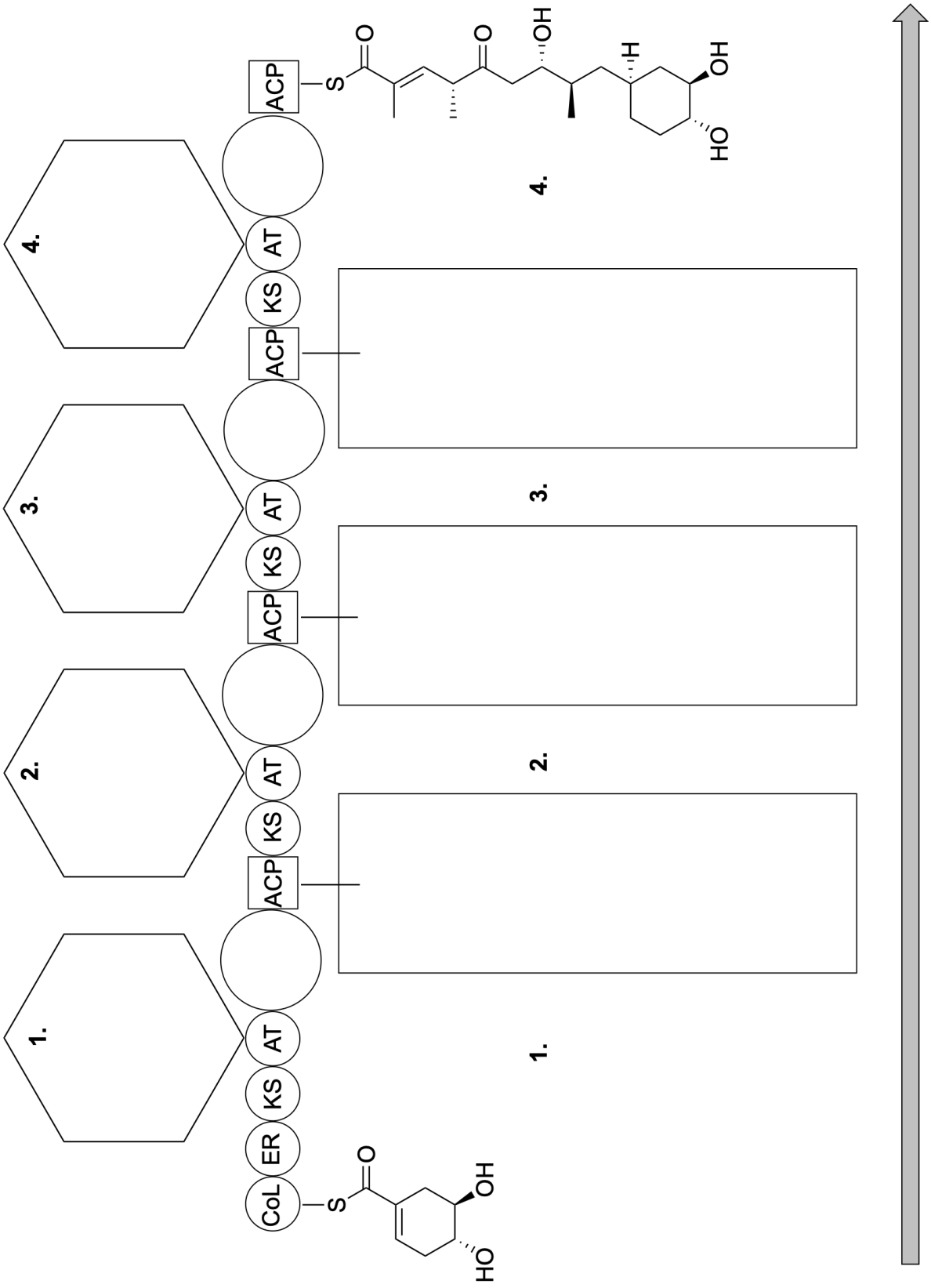


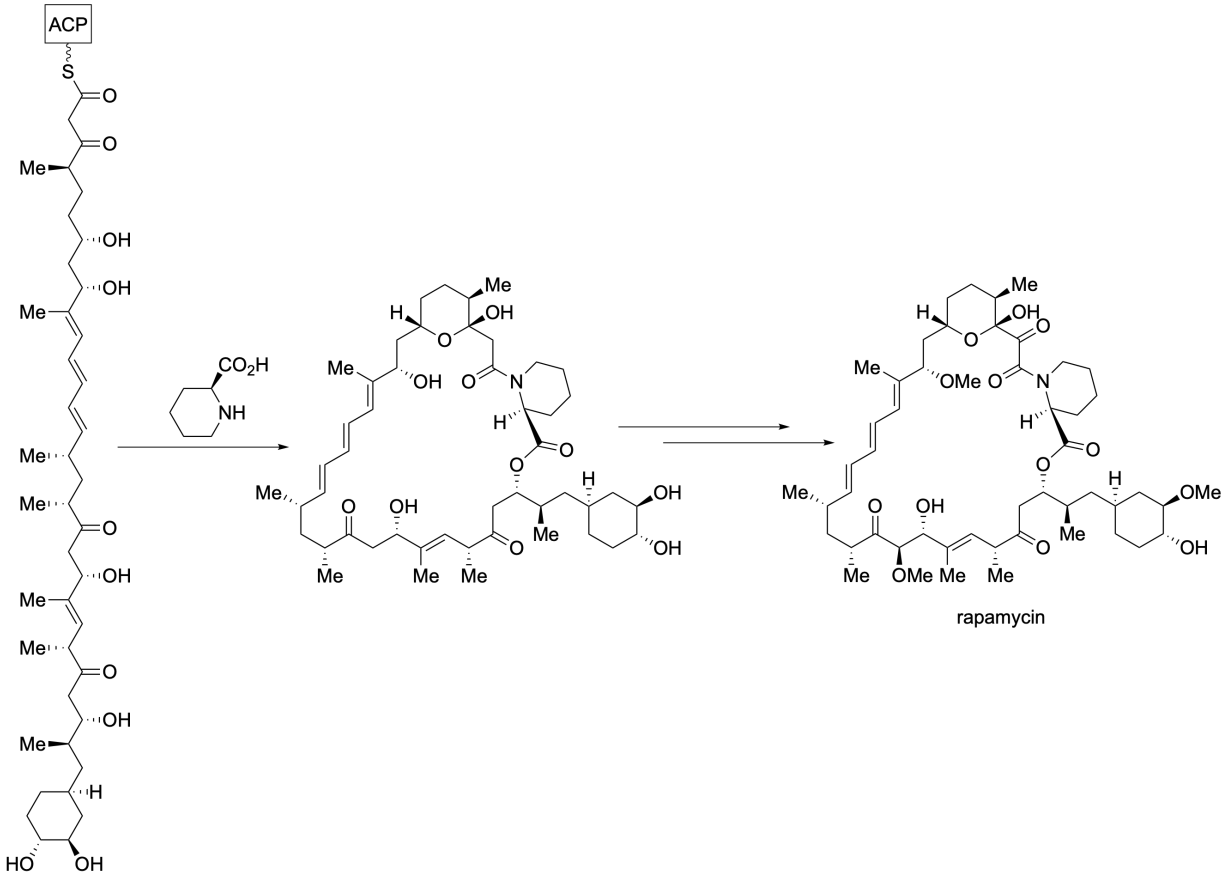


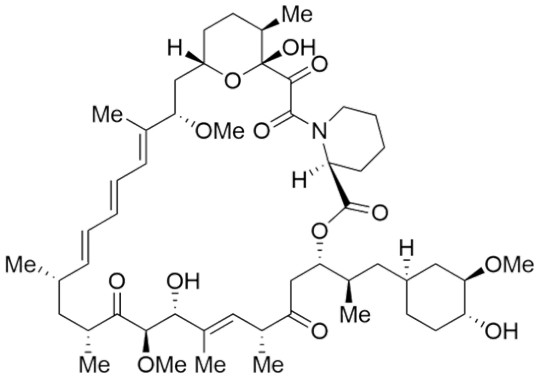
rapamycin

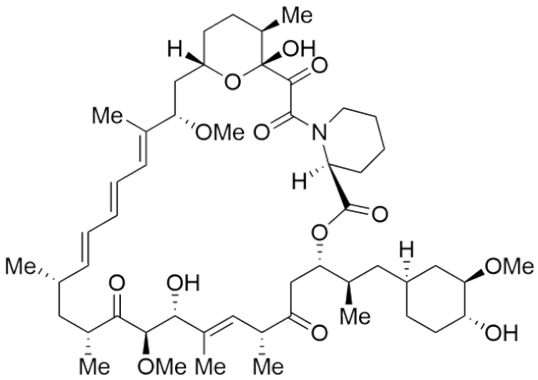


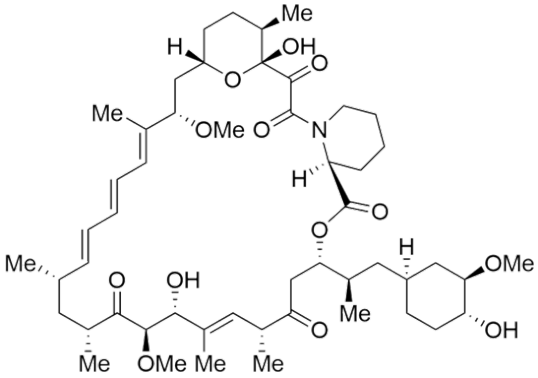



ACP
S
O
O
OH
H
OH
HO
4.
4.
AT
KS
ACP
3.
3.
AT
KS
ACP
2.
2.
AT
KS
ACP
1.
1.
AT
KS
ER
CoL
S
O
OH
HO

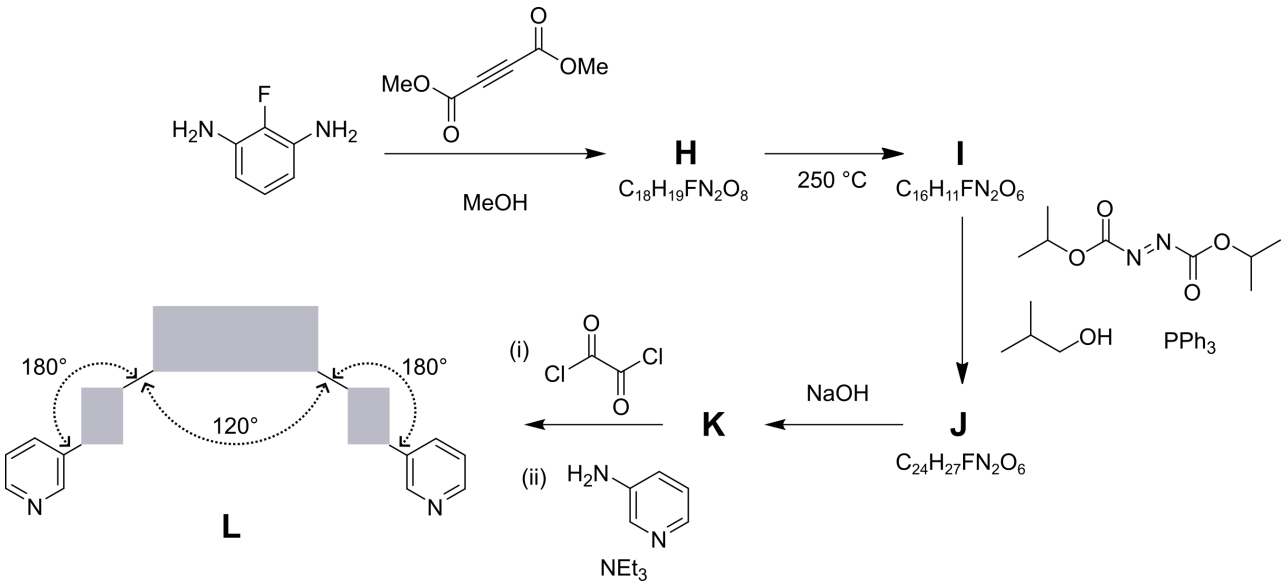

ACP
S
O
O
Me
OH
OH
Me
Me
Me
O
OH
Me
Me
O
OH
Me
Me
O
OH
Me
H
HO
OH
CO2H
NH
Me
H
OH
O
Me
OH
O
N
H
O
O
Me
O
OH
Me
Me
Me
H
OH
OH
Me
H
OH
O
Me
OMe
O
N
H
O
O
Me
O
OH
Me
Me
OMe
Me
Me
H
OMe
OH
rapamycin



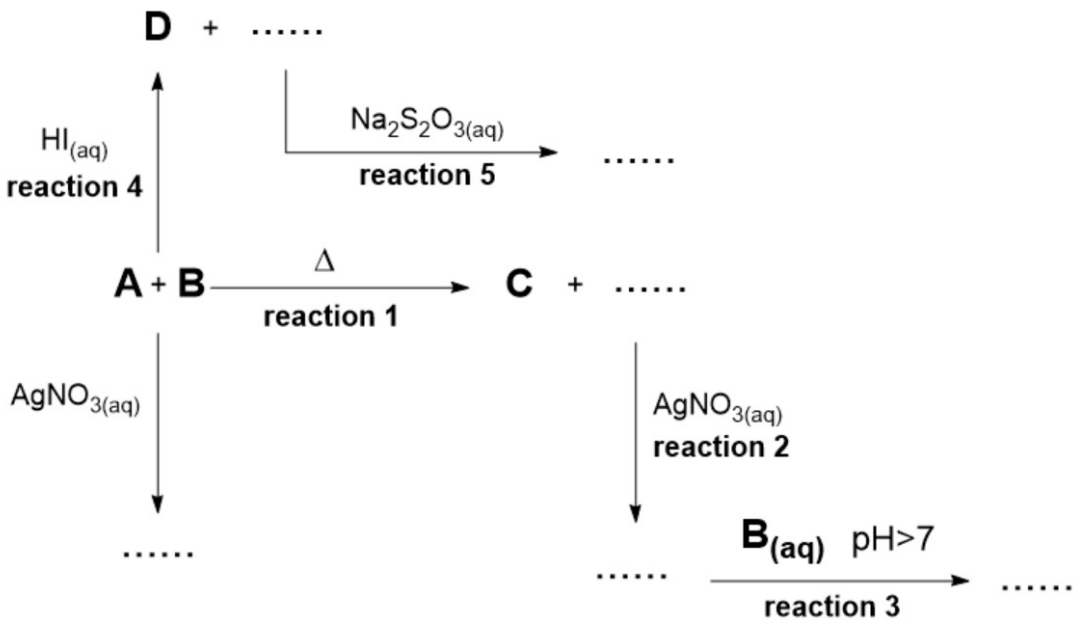




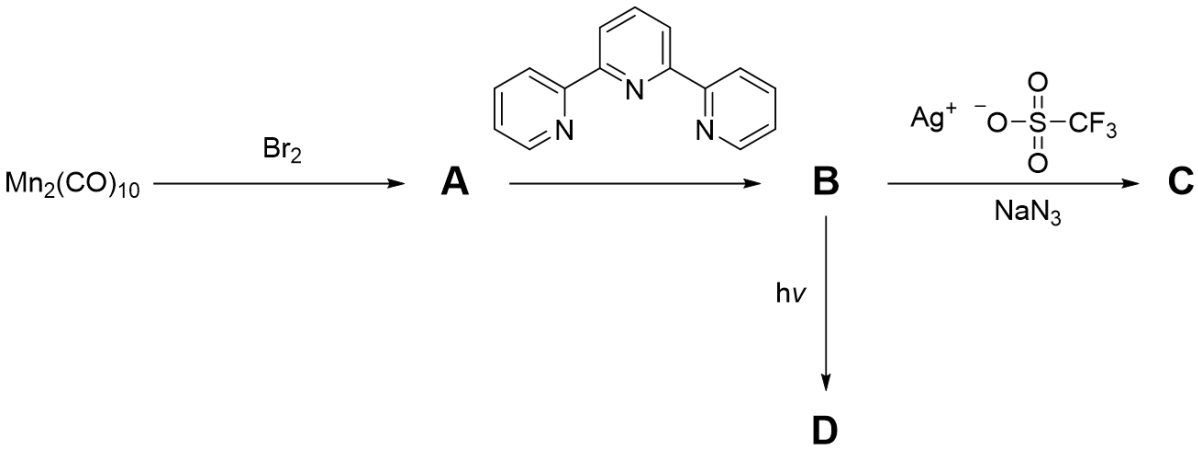
Q3


F
H2N
NH2
MeO
O
OMe
O
MeOH
H
C18H19FN2O8
250 °C
I
C16H11FN2O6
O
O
N
N
O
O
OH
PPh3
J
C24H27FN2O6
NaOH
K
(i)
Cl
Cl
O
O
(ii)
H2N
N
NEt3
180°
180°
120°
N
N
L

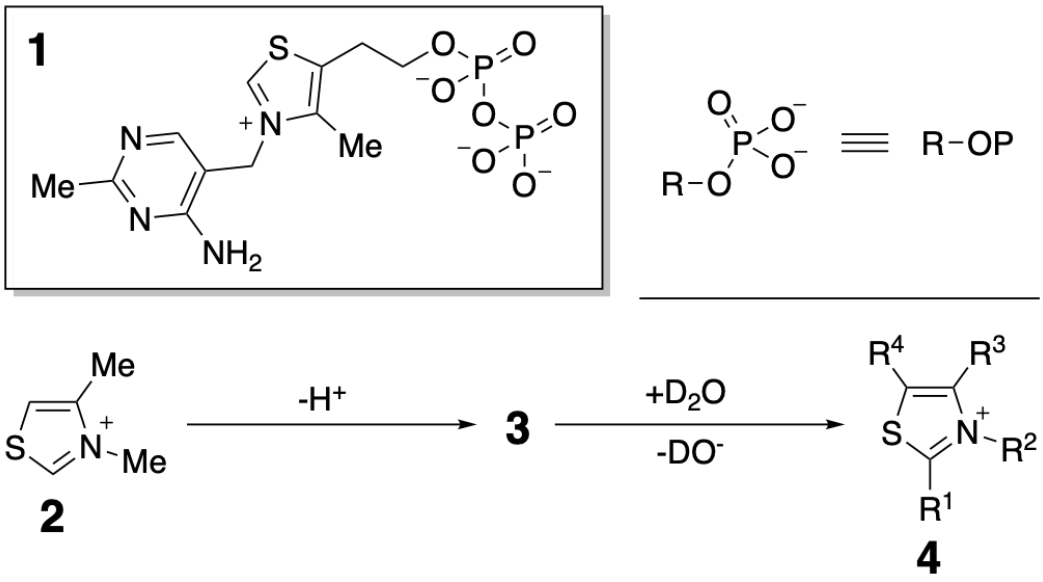
Q4

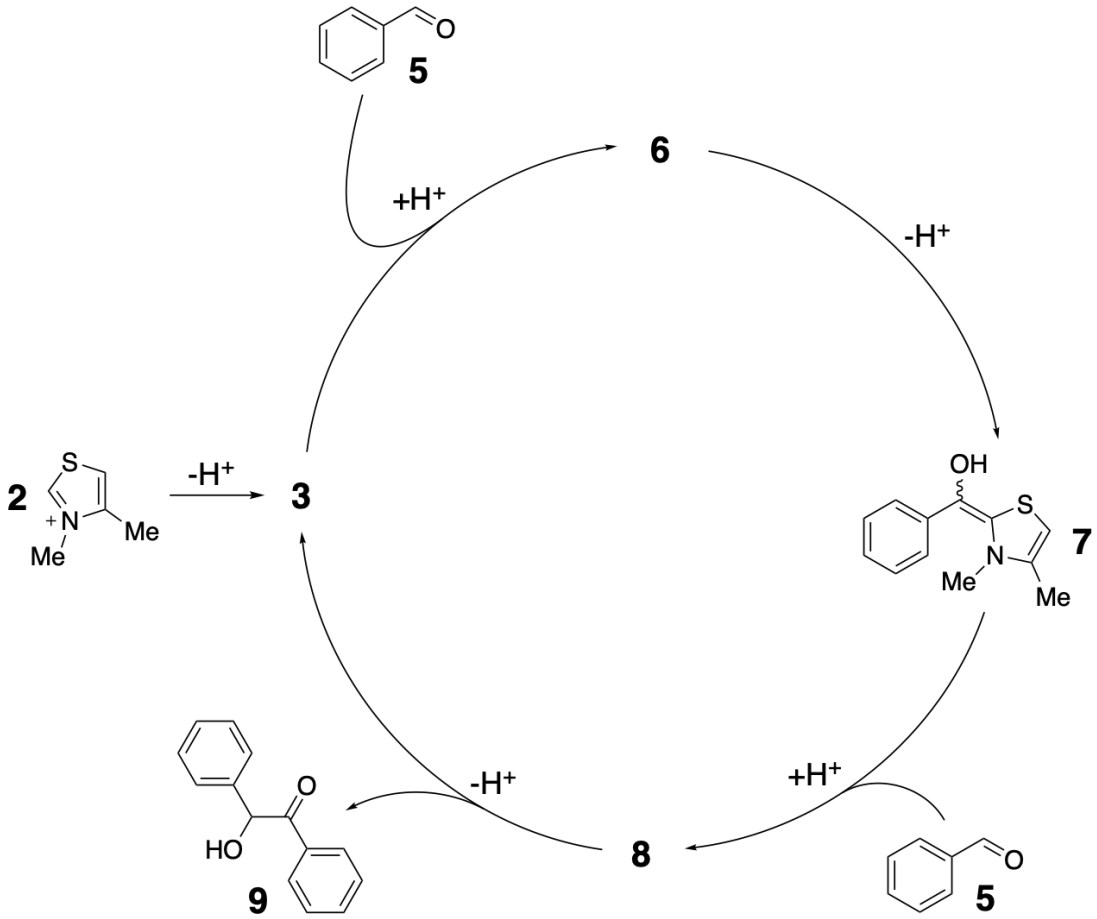

D + ...
$Na_2S_2O_{3(aq)}$
reaction 5
.....
$HI_{(aq)}$
reaction 4
A + B
Δ
reaction 1
C + ...
$AgNO_{3(aq)}$
$AgNO_{3(aq)}$
reaction 2
.....
.....
$B_{(aq)}$ pH>7
reaction 3
.....

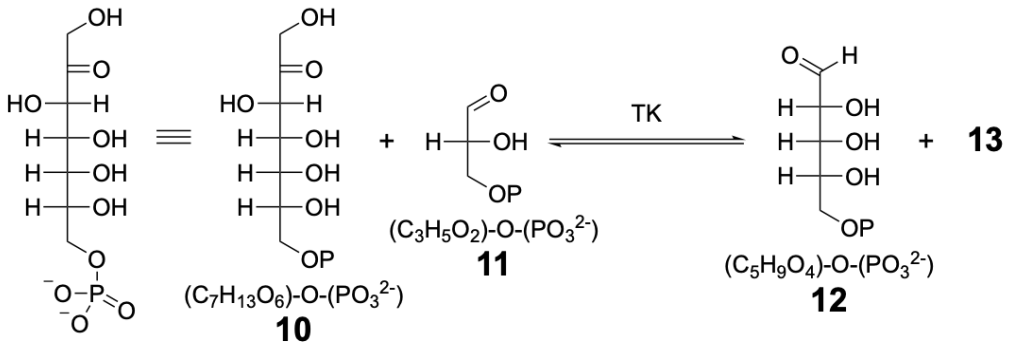
Q8

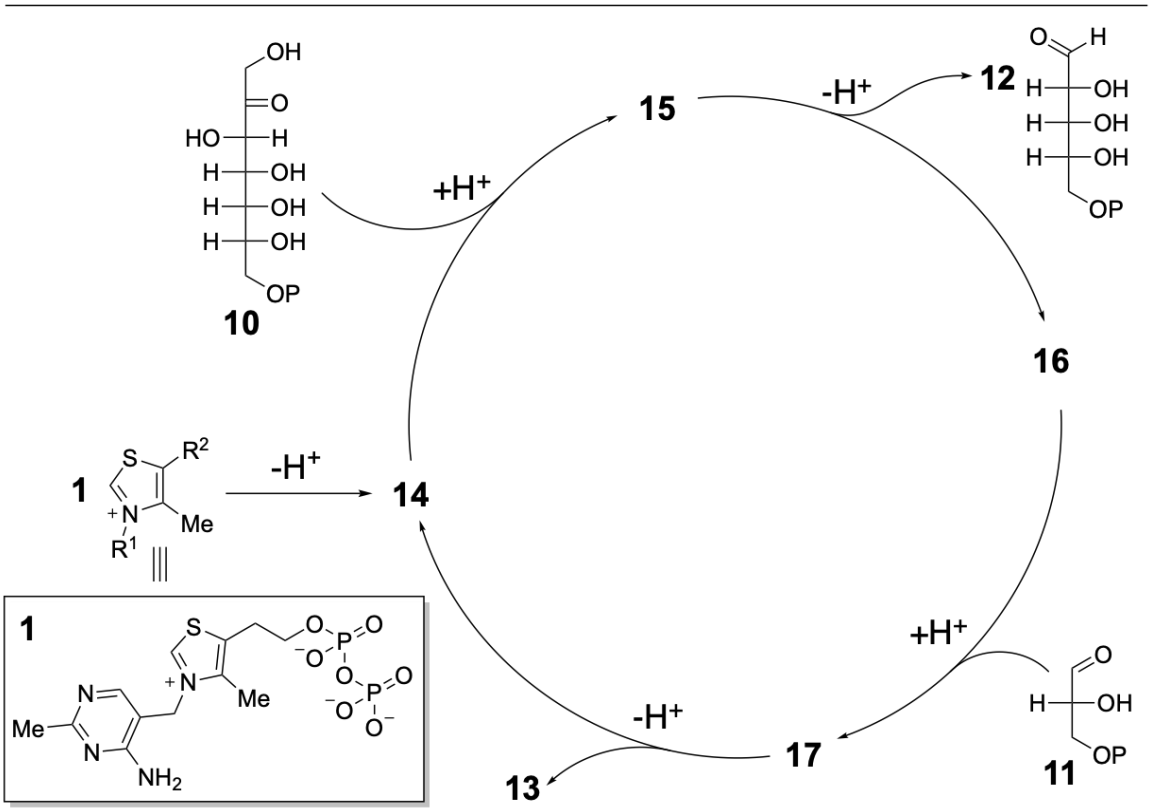


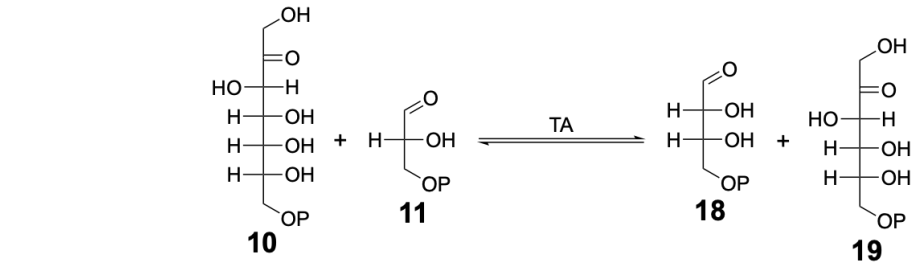
Q9

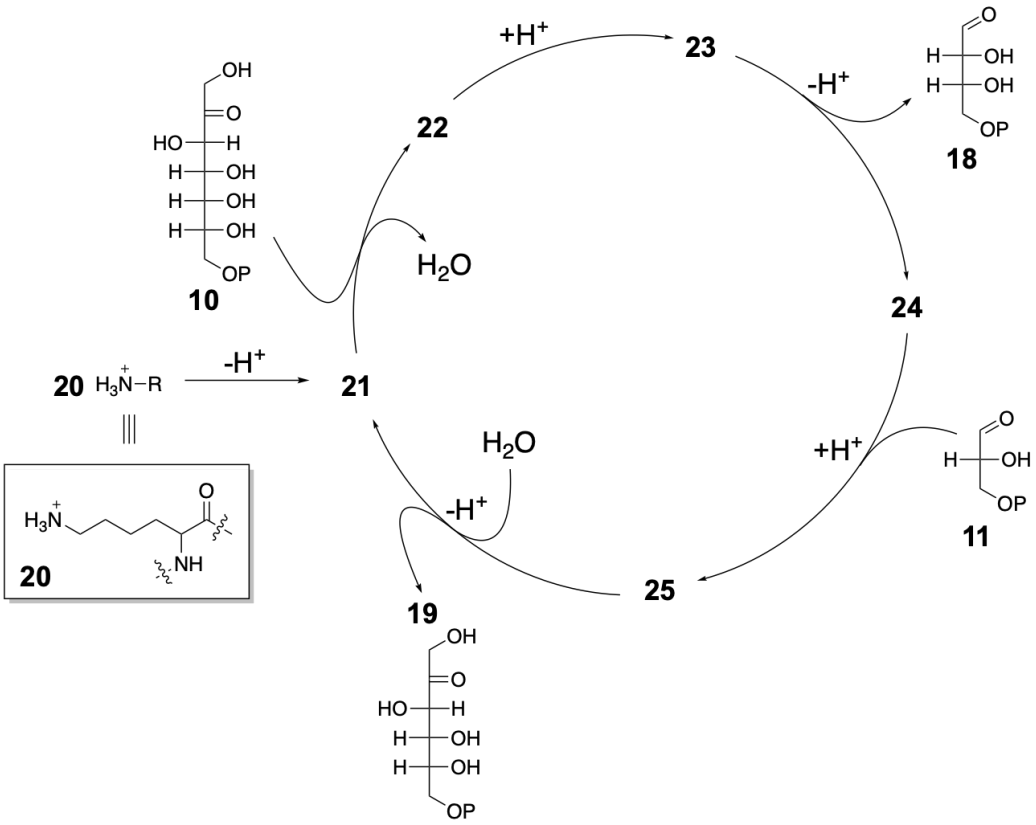

1
S
N
Me
N
NH2
O
P
O
O
P
O
O
O
O
P
O
O
R–O
≡
R–OP
Me
S
N
Me
2
-H+
3
+D2O
-DO-
R4
R3
S
N
R2
R1
4

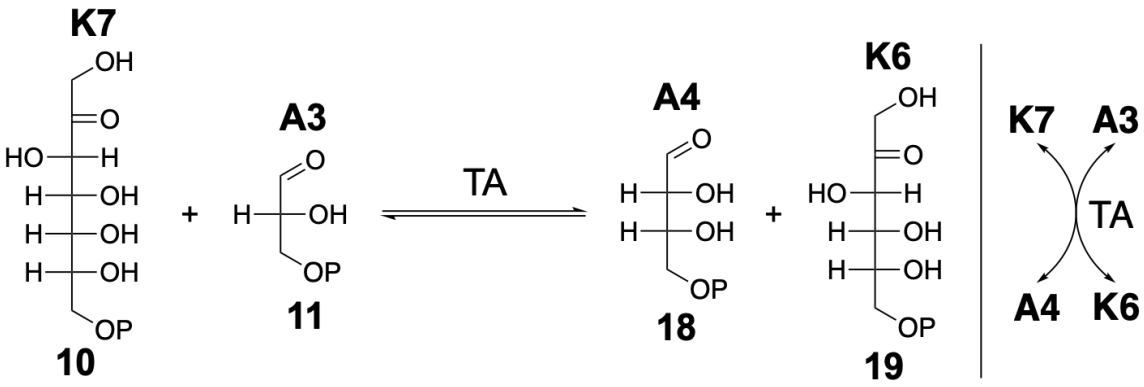

5
6
+H+
-H+
OH
S
N
Me
Me
7
+H+
5
8
-H+
HO
O
9
2
S
+N
Me
Me
-H+
3


TK
+
13
(C7H13O6)-O-(PO32-)
10
(C3H5O2)-O-(PO32-)
11
(C5H9O4)-O-(PO32-)
12


10
+H+
15
-H+
12
16
1
-H+
14
+H+
11
17
-H+
13


OH
O
HO
H
OH
OP
10
11
18
19
TA


+H+
23
-H+
22
24
H2O
-H+
20
21
+H+
H2O
-H+
25
19
10
18
11
20


K7
OH
O
HO
H
H
OH
H
OH
H
OH
OP
10
+
A3
O
H
OH
OP
11
TA
A4
O
H
OH
H
OH
OP
18
+
K6
OH
O
HO
H
H
OH
H
OH
OP
19
K7
A3
TA
A4
K6