Synthesis of Streptolydigin, a Potent Bacterial RNA Polymerase Inhibitor
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1) Please explain the selectivity.

![Chemical Structures and Reactions](Image)

2) What is the name of this reaction? Explain the selectivity with a model. Do you know alternative reaction conditions resulting in the same selectivity? How could you obtain the opposite selectivity?

- **Evans Tishchenko reduction**
  - Conditions: Me₄NBH(OAc)₃
  - Alternative anti reduction:
    - **Evans–Saksena reduction**
      - Conditions: Me₄NBH(OAc)₃
    - **Narasaka–Prasad reduction**
      - Conditions: Bu₂BOMe, NaBH₄

- **Attack according to Fuerst–Plattner rule**
8) MeNHOMe • HCl, i-PrMgCl
9) MeLi
10) TsOH
11) LDBB
12) DMP
13) Ph$_3$P(Me)CO$_2$Et, PhMe, Δ
14) DIBAL-H
15) TIPS-Cl, imidazole, DMAP
16) LAH
17) Tf$_2$O, py, then DBU
18) TBAF
19) DMP

How could you access 1 from X?

1) Ad-mix (β, MeSO$_2$NH$_2$
2) Me$_2$C(O)Me$_2$, PPTS
3) Tf$_2$O, py, then DBU
4) KOH, MeOH

60% over 4 steps

What is the structure of LDBB?

LDBB

Freeman's reagent

Hint: Step 16 is a selective monodepotation
How would you prepare F?

20) TEMPO, PIDA
21) TFA, basic alumina

Hint: A cyclization takes place
20) TEMPO, PIDA
21) TFA, basic alumina

22) 2, MeOH
23) 3, CF$_3$CO$_2$Ag, 5Å MS

Name at least one alternative method to synthesize α-amino acids.
Strecker reaction, asymmetric variants available
Schöllkopf method
Sharpless aminohydroxylation

Key step: please provide a mechanism
Mechanism of step 24

Dieckmann cyclization + imide opening

Horner–Wadsworth–Emmons olefination

streptolydigin