The Asymmetric Total Synthesis of Fijiolide A

1) TMS—Li
2) RuCl(p-cymene)[(R,R)-Ts-DPEN], i-PrOH

3) X, Cp*Ru(cod)Cl, DCE → Y

**key step.** Please come up with a mechanism. PG = TBDPS

$X + A \xrightarrow{\text{Cp*Ru(cod)Cl, cyclo-metallation}} Y$

4) NCS, CuCl, MeCN, H₂O
5) TBAF, THF
6) TBSOTf, 2,6-lutidine
7) Mo(CO)₆, DMSO, tol, 90 °C

8) OsO₄, (DHQ)₂PHAL, NMO
9) TsCl, DMAP
10) CSA, MeOH

step 4: see Org. Lett. 2010, 12, 1192.

**key step.** What's the name of this reaction? Please come up with a mechanism.


Hint: compound D is a tricyclic compound.

11) CDI, MgCl₂, KO₂C≡CO₂Me
12) NH₄OAc, MeOH
13) ((R)-DM-Segphos)Ru(OAc)₂, H₂ (30 atm), AcOH, MeOH

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Step 19: Please come up with a transition state that explains the selectivity of this transformation. How is this type of selectivity called?
key step. Please explain the selectivity of this transformation. Attack in α-position of the aminosugar due to sterical hinderance of the i-Pr groups.