Total Synthesis of Haterumaimide J

1) Name the starting material.
(S)-epichlorohydrin

3) Name the reaction
Negishi carboalumination

5) Name the reaction - 6:1 syn:anti ratio.
Sharpless dihydroxylation

7) Name the reaction, show a mechanism
B-alkyl Suzuki coupling

8) Draw a 3 dimensional transition state
see last page
9) TBSCI, imidazole
10) O₂, rose bengal, hv, CH₂Cl₂, then TBAF, Mel
11) H₂, Pd/C
12) Ph₃P≡CH₂
13) DIBAL-H

14) 4, Cy₂BOTf, NEt₃, CH₂Cl₂
15) NH₃/MeOH, then NaH, THF
16) HF-pyr

10) What is the role of rose bengal?
   To generate singlet oxygen from triplet oxygen - it's a photosensitizer
Mechanism for Step 7:

Transition state 8:

>20:1 dr dictated by the chlorine atom being in the more preferable equatorial position.