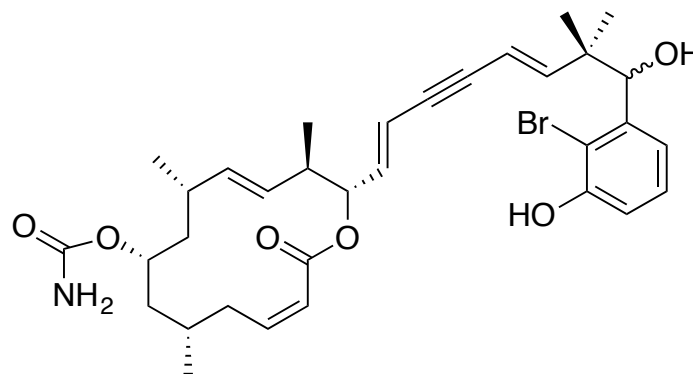


# Total Synthesis and Stereochemical Assignment of Callyspongiolide



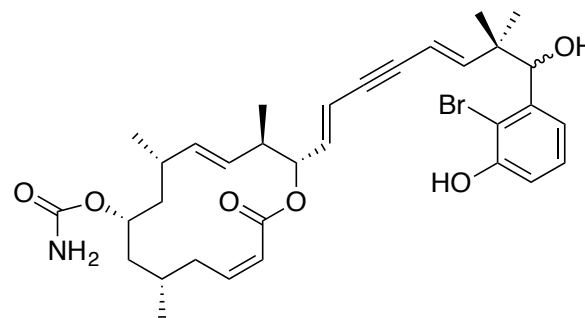
Literature Presentation  
levgeniia Kovalova

16. 06. 2016

Zhou J., Gao B., Xu Zh., Ye T. *J. Am. Chem. Soc.*, **2016**, 138 (22), pp 6948–6951

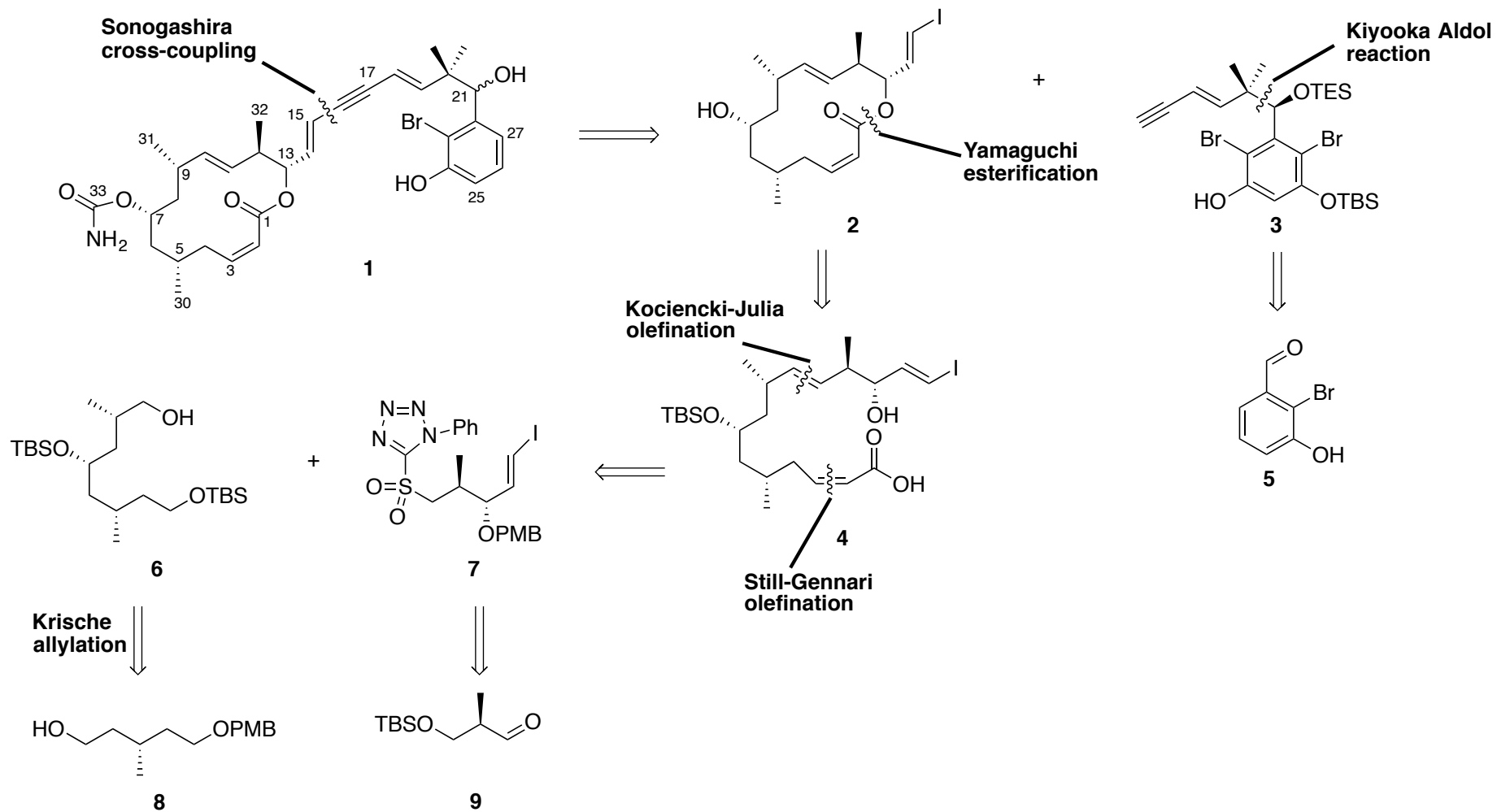
## Isolation and biological activity

**Callysngiolide** was isolated from the marine sponge *Callyspongia* sp. collected in Indonesia.

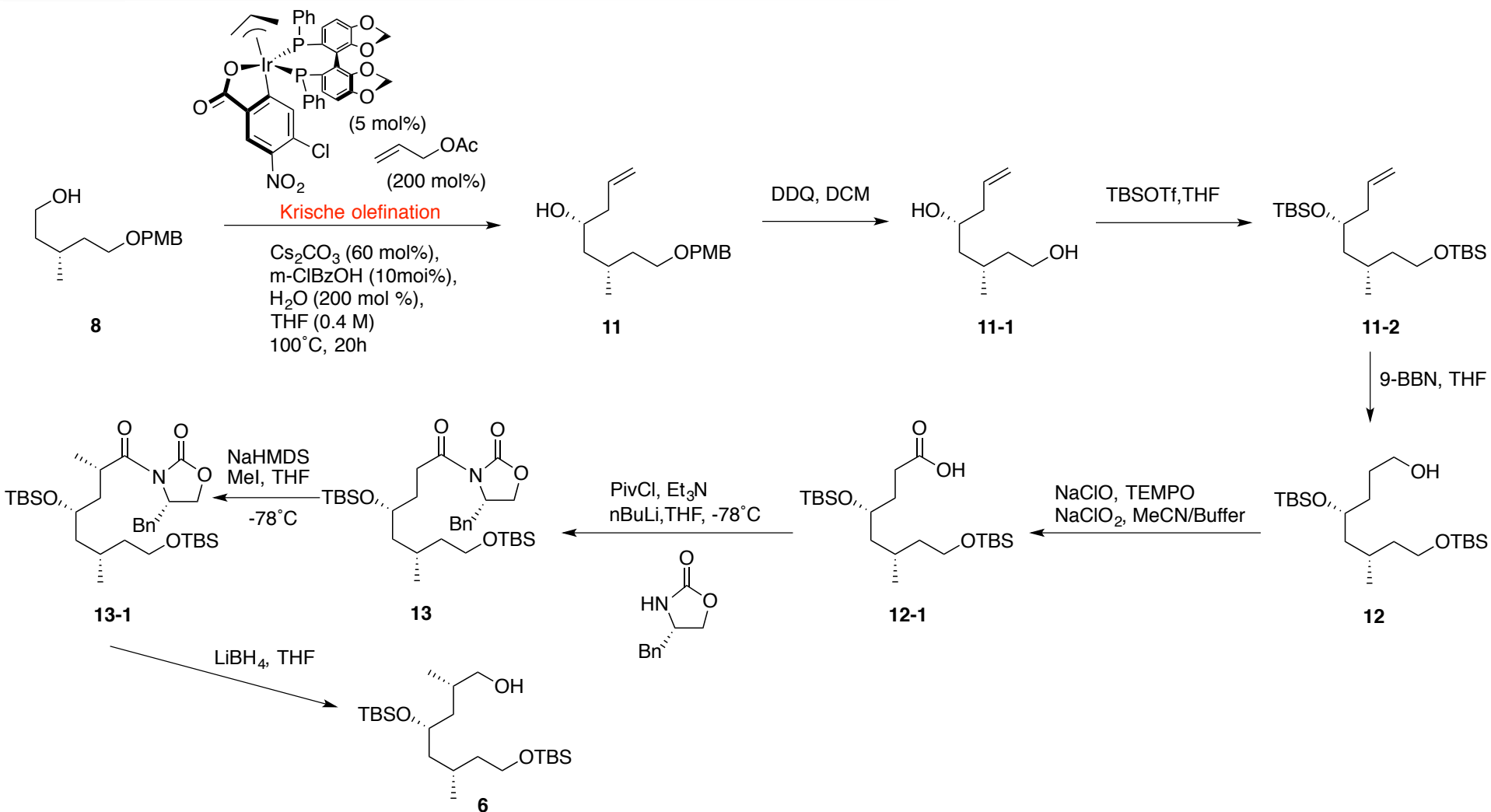


**Callysngiolide** showed strong *in vitro* cytotoxicity against human Jurkat J16 T (IC<sub>50</sub>=70 nM) and Ramos B (IC<sub>50</sub>=60 nM) lymphocytes.

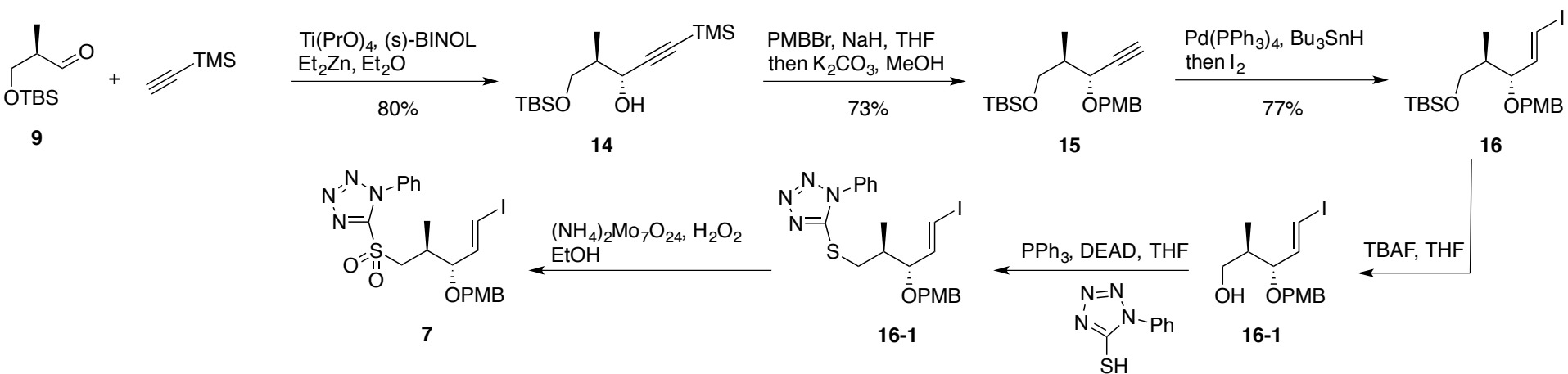
# Retrosynthetic Analysis of Callyspongiolide (1)



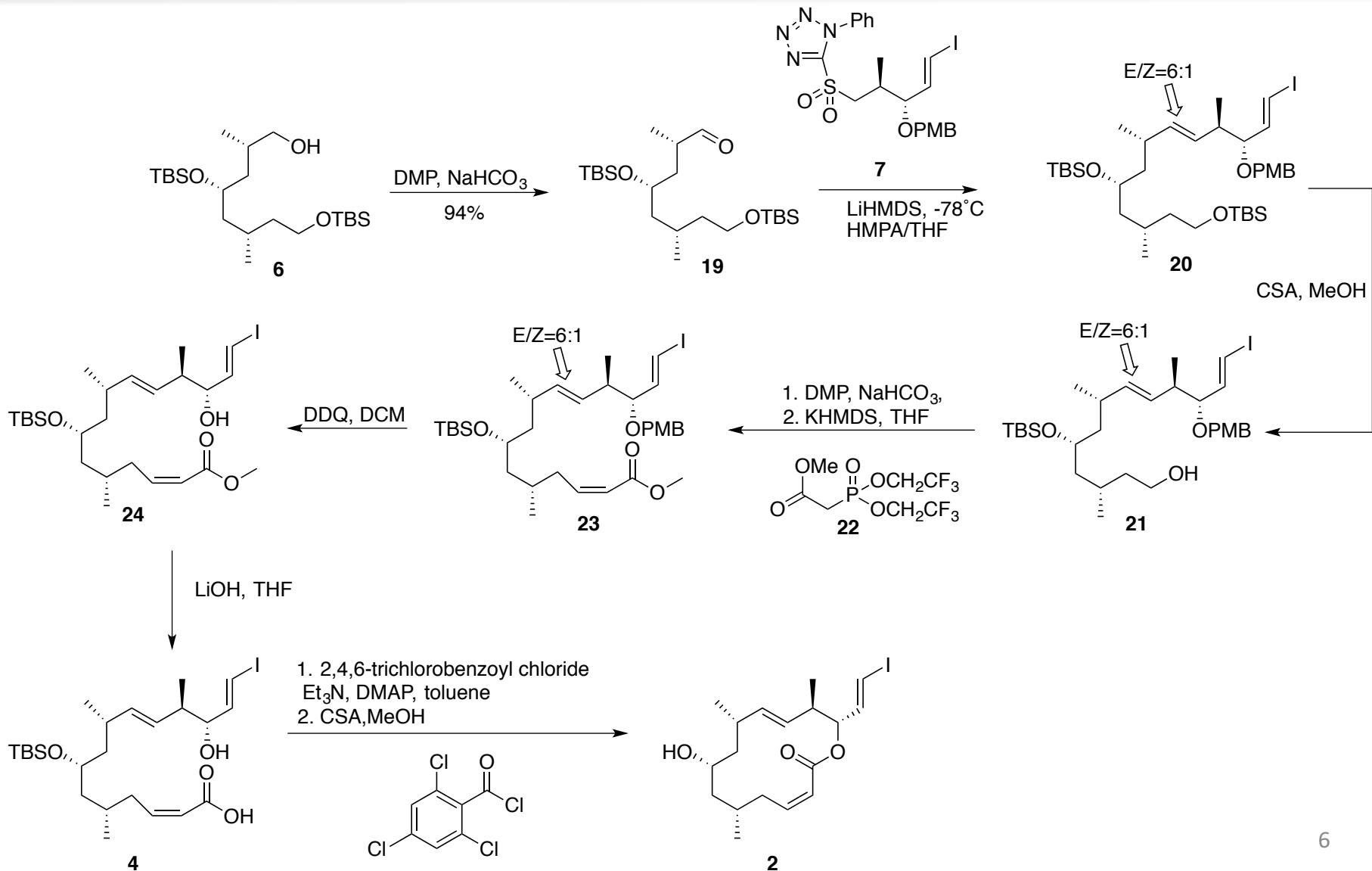
# Synthesis of Fagment 6



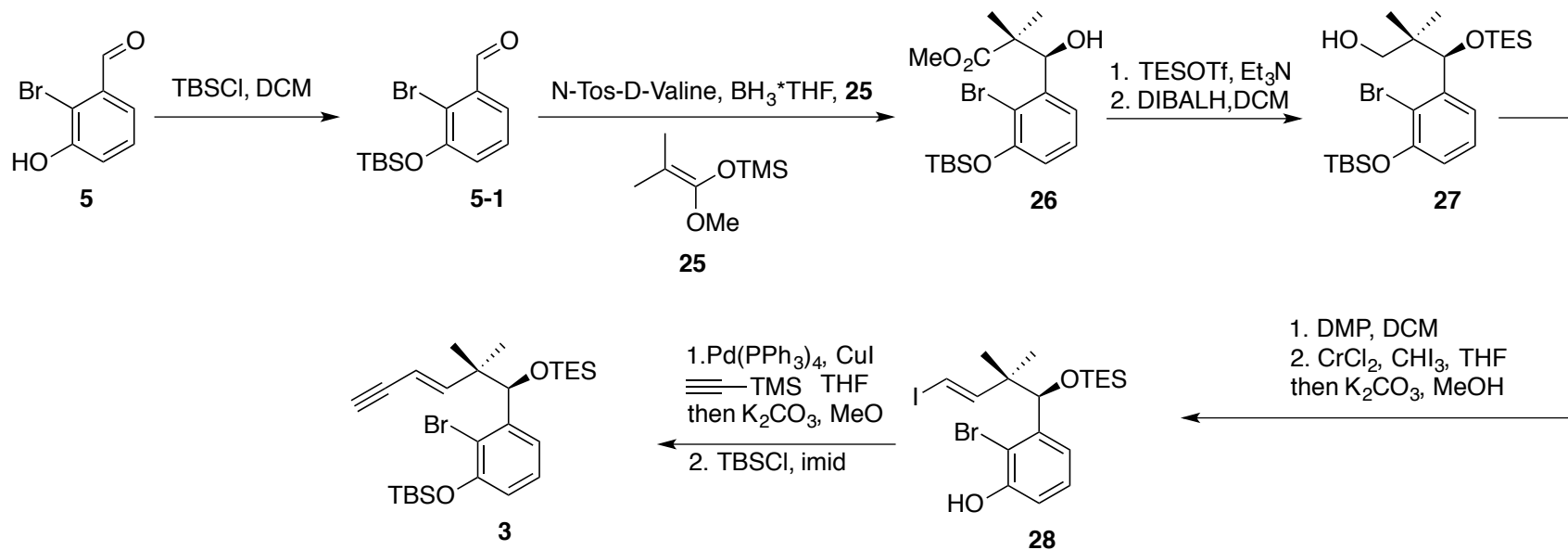
# Synthesis of Fragment 7

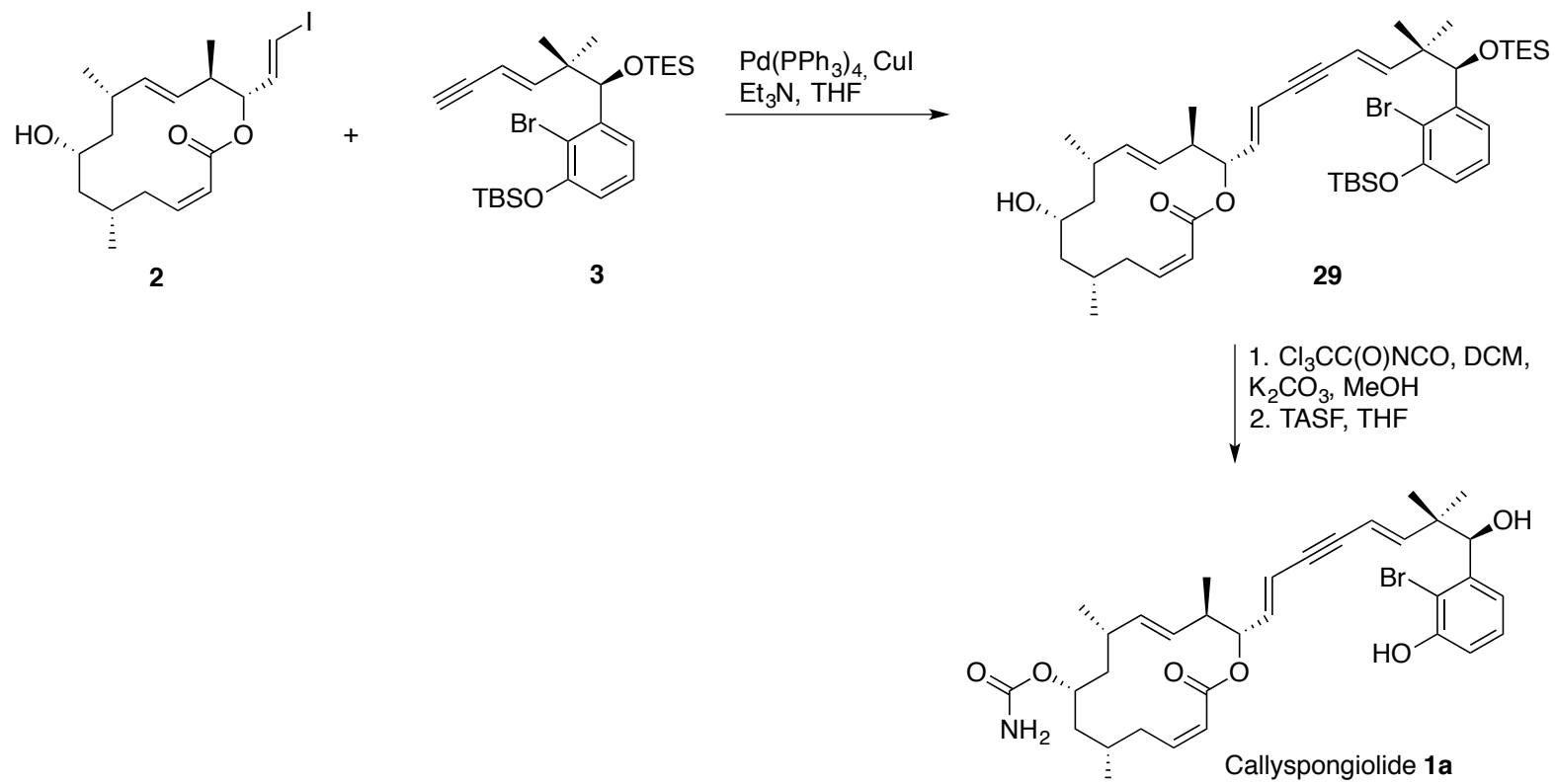


# Synthesis of Macrolactone 2

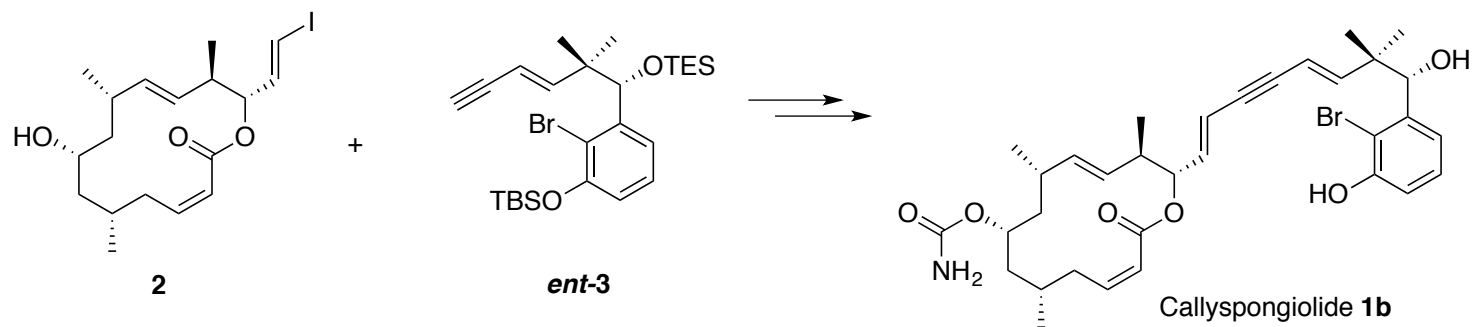


# Synthesis of Fragment 3

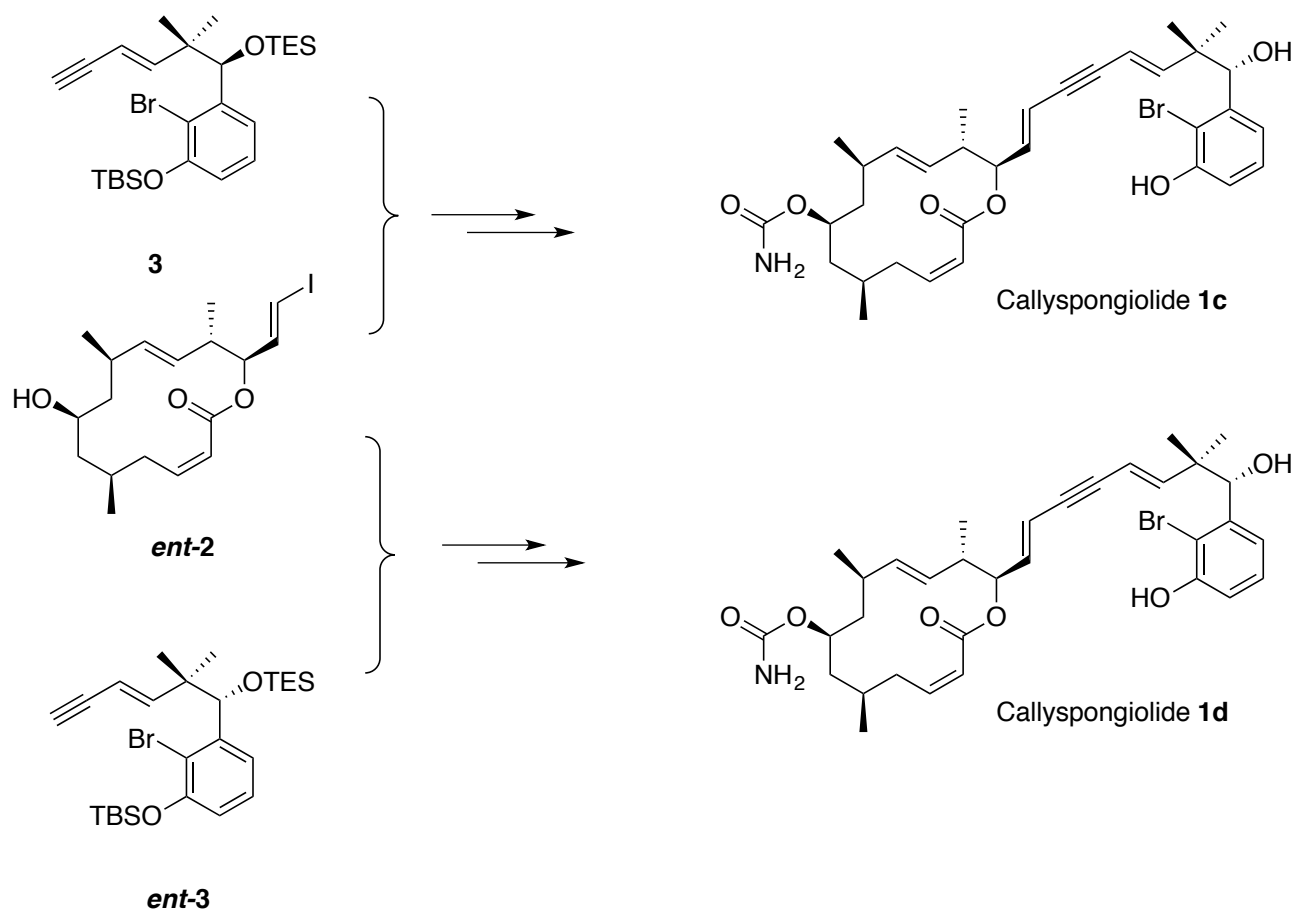


Synthesis of Callyspongiolide **1a**



Synthesis of Callyspongiolide **1b**

(synthetic procedure as for **3**, but using L- instead of D-valine)

Synthesis of Callyspongiolide **1c** and its Epimer **1d**

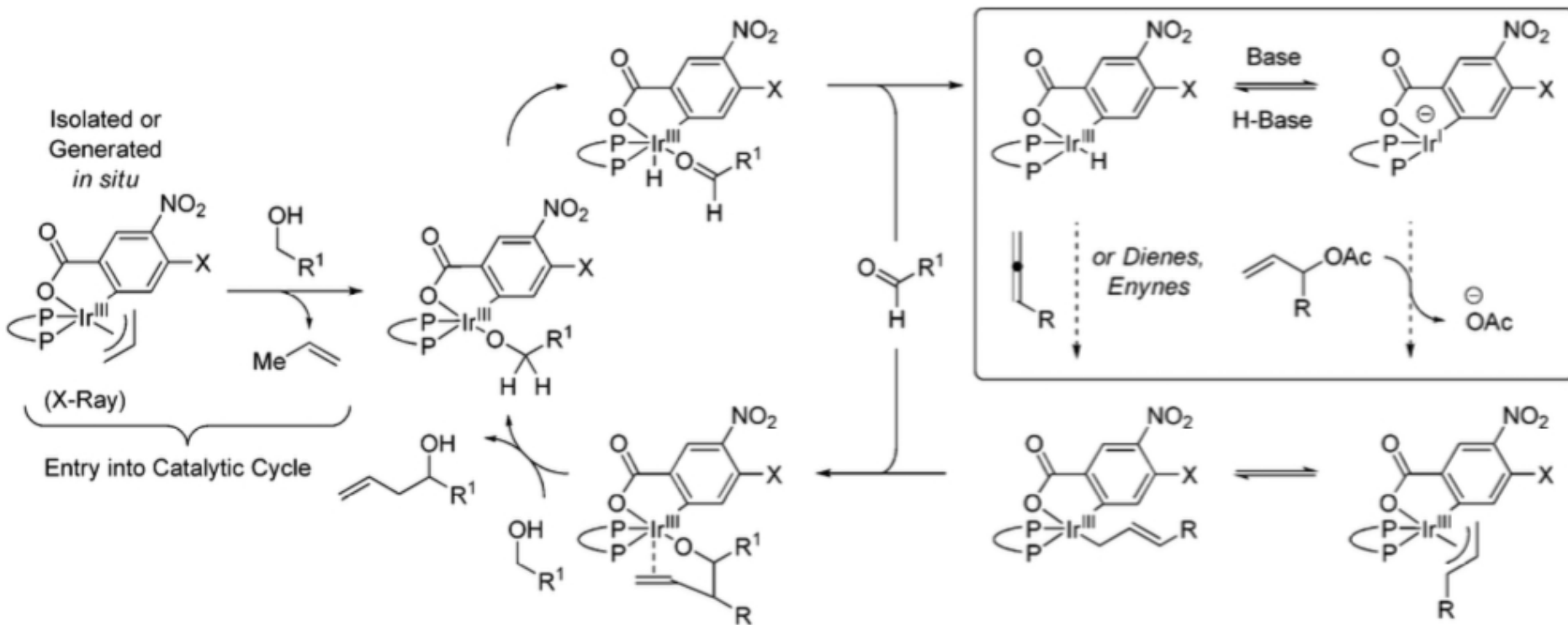
## Conclusion

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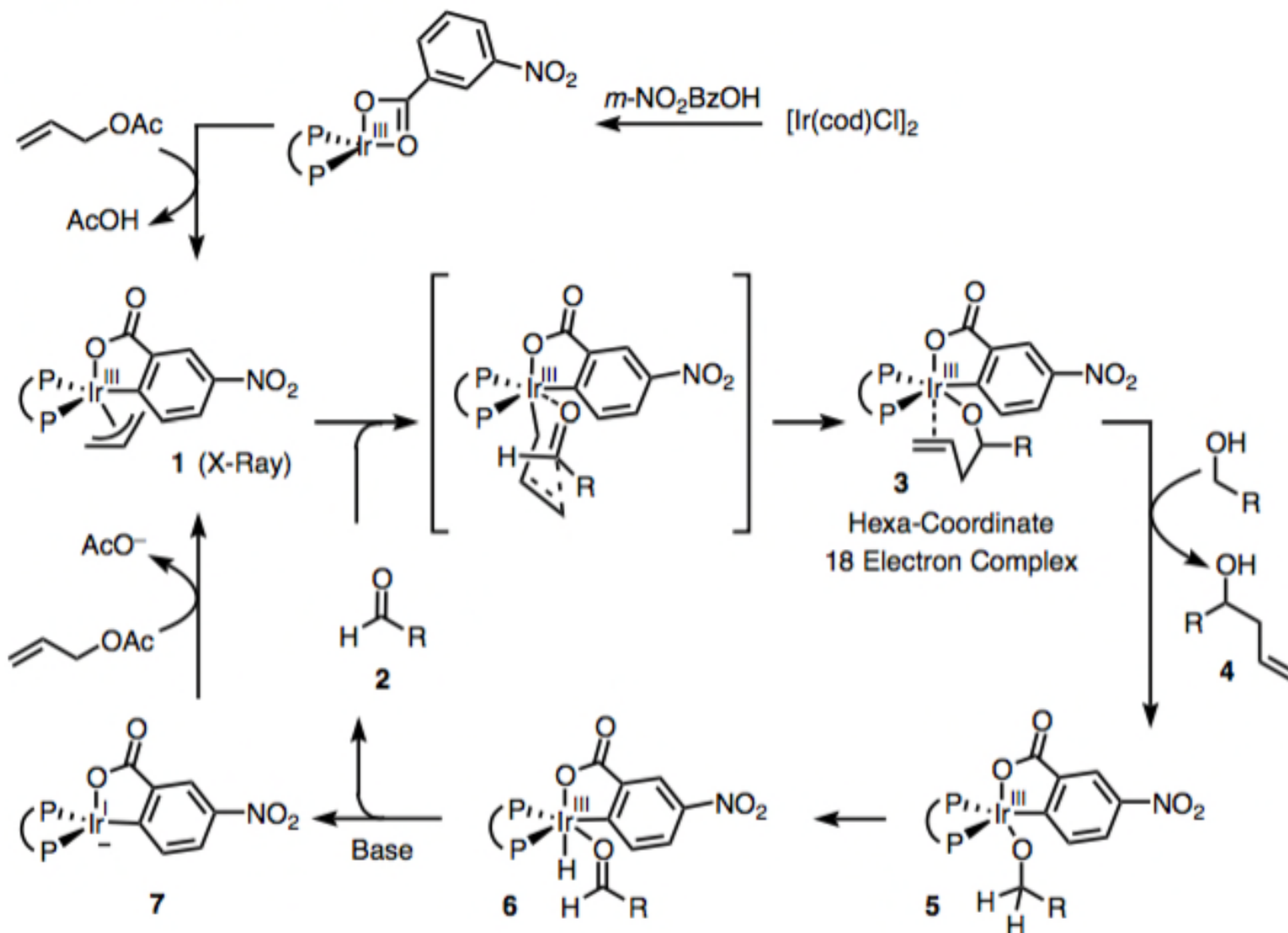
- First total synthesis of Callyspongiolide and three additional stereoisomers had made.
- Established the relative stereochemistry as well as the absolute configuration of the natural product.
- Evaluation of biological activity against different types of cancer cells displayed inhibitory activities.

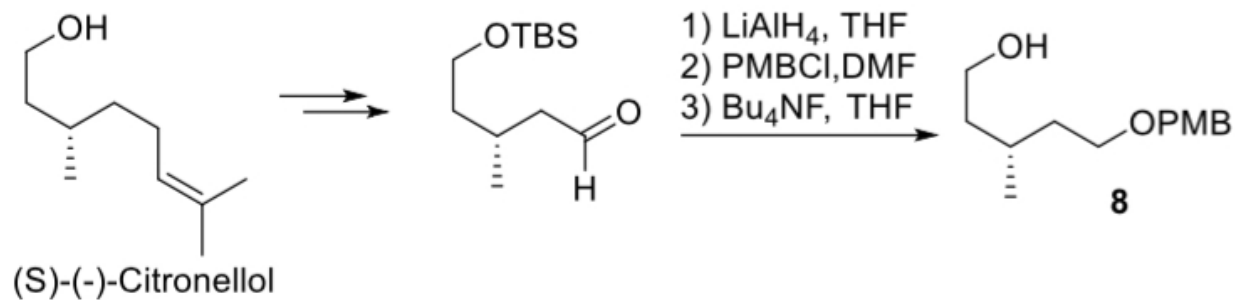
Thank you for your attention!

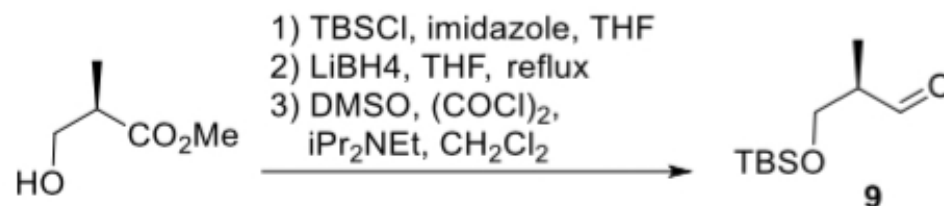
## Krische allylation



## Proposed Catalytic Cycle:



Preparation of the known alcohol **8**

Preparation of the known aldehyde **9**

Kirkham, J. E. D.; Lee, V.; Baldwin, J. E. *Chem. Commun.* **2006**, 27, 2863.

## Kiyooka aldol reaction

**Scheme 2.** Proposed Mechanism for the Kiyooka Aldol Reaction