10-Step Asymmetric Total Synthesis and Stereochemical Elucidation of (+)-Dragmacidin D

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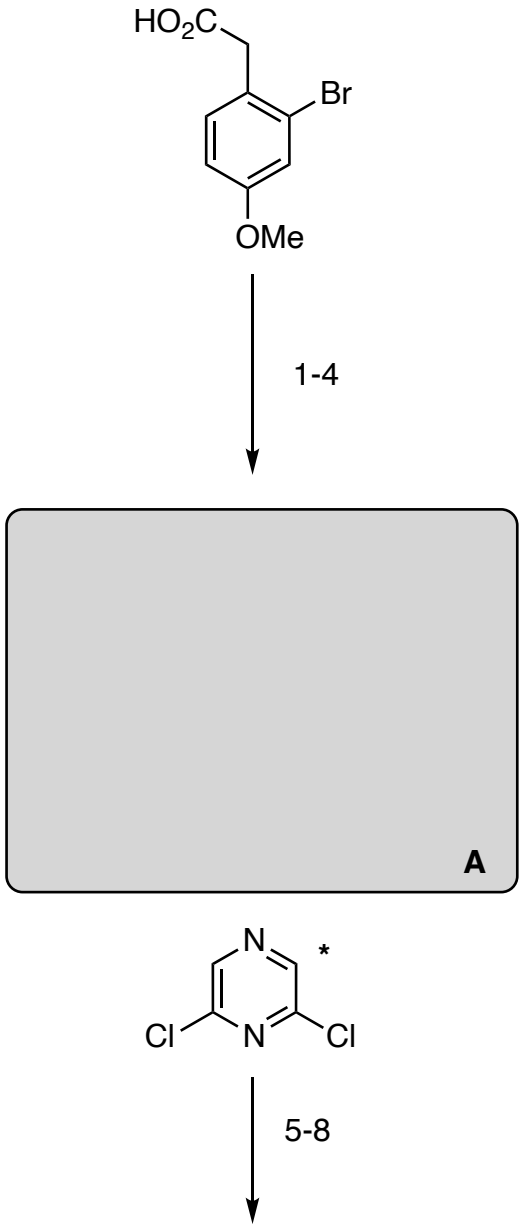
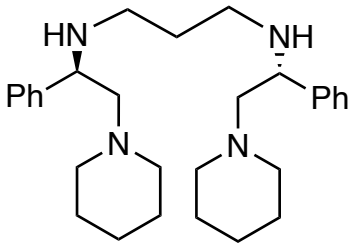
Angew. Chem., Int. Ed. **2015**, *54*, 9971–9975.



1) **1**, LiN(*t*Bu)SiMe$_3$, CH$_3$I
2) **2**, **3**, pyridine, DMAP
3) Cu(NO$_3$)$_2$ Ac$_2$O
4) NH$_2$NH$_2$, Pd/C



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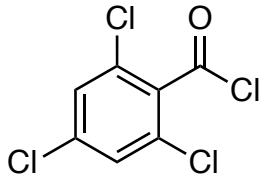

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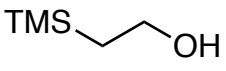
5)* NaI, HI, H$_2$O
6) KOH *t*BuOH
7) TBSCl, NEt$_3$
8) **4**, PdCl$_2$(PPh$_3$)$_2$ CuI, NEt$_3$



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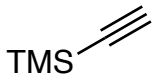

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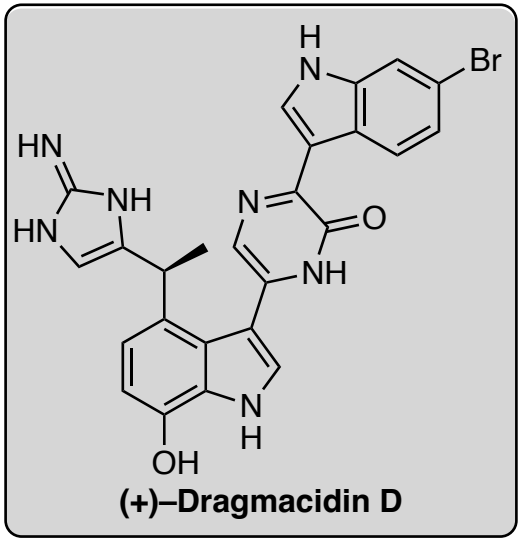
1) Name of reaction?
Zakarian Alkylation

2) Name of reaction?
Yamaguchi Esterification

3) Hint: Theoretical
IR Stretch at 1573 and 1383 cm^{-1}

5) Name of Starting Material?
2,6-dichloropyrazine

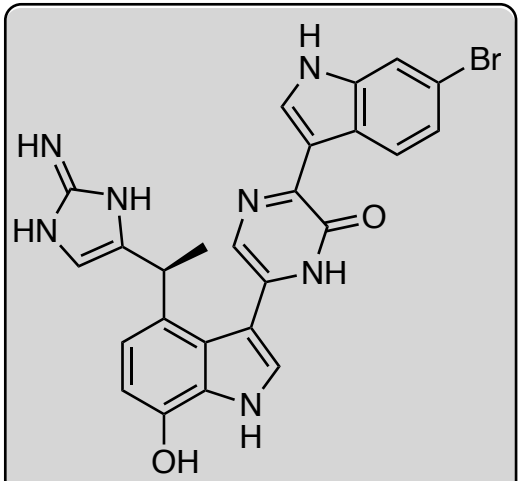
8) Name of reaction?
Sonogashira Coupling



(+)–Dragmacidin D

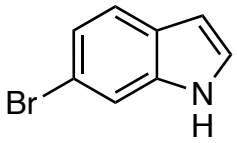
B

9-14



(+)–Dragmacidin D

9) **A,B** ((*t-Bu)*$_2$PF)$PdCl_2$, NEt_3 TBABr
10) BBr_3
11) **5**, CF_3SO_3H, DMF, O_2
12) **6,** CDI
13) **7**, CuOAc
14) CF_3CO_2H



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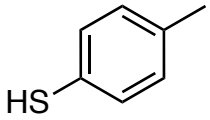

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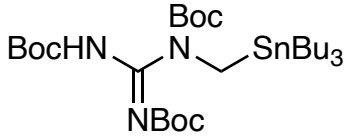

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9) Name of Reaction?
Larock Indole Synthesis