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# Enantioselective Total Synthesis of (+)-Hinckdentine A via a Catalytic Dearomatization Approach

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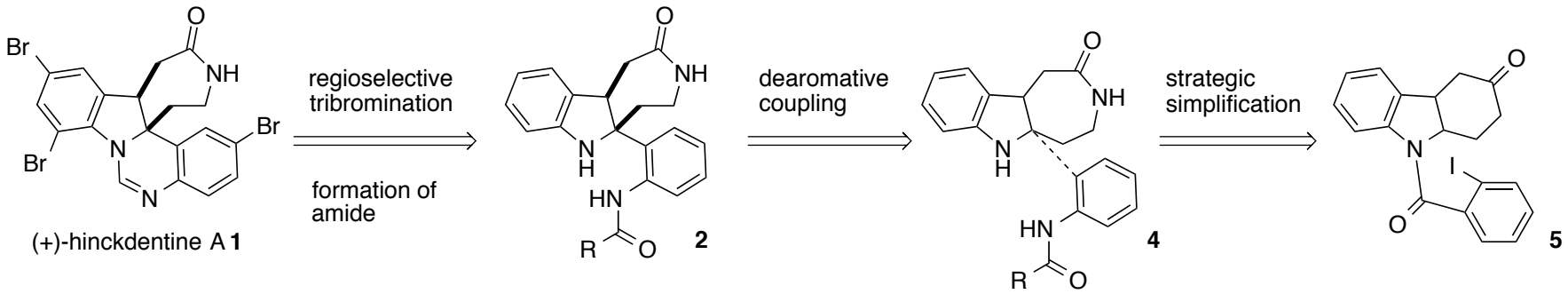
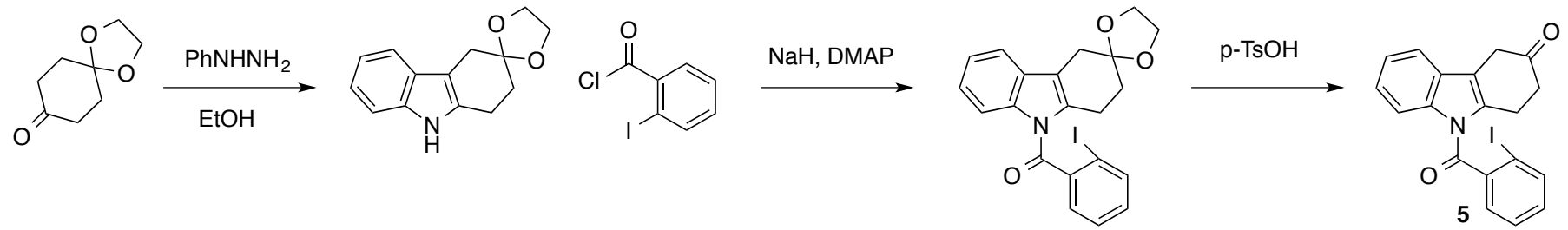
## Introduction

The authors performed the first enantioselective synthesis of (+)-hinckdentine A, a natural product isolated from the marine bryozoan *Hincksinoflustra denticulata*. The biological properties of (+)-hinckdentine A have not been reported. The authors were able to prepare 300 mg of product from readily available intermediate **5** in 14 steps and in 8.8% yield. The total synthesis features a key enantioselective dearomative coupling step to simultaneously prepare a quaternary stereocenter and to attach the aryl group to the carbazole core. The dearomative coupling/cyclization strategy could be applied to the synthesis of other natural products of interest.

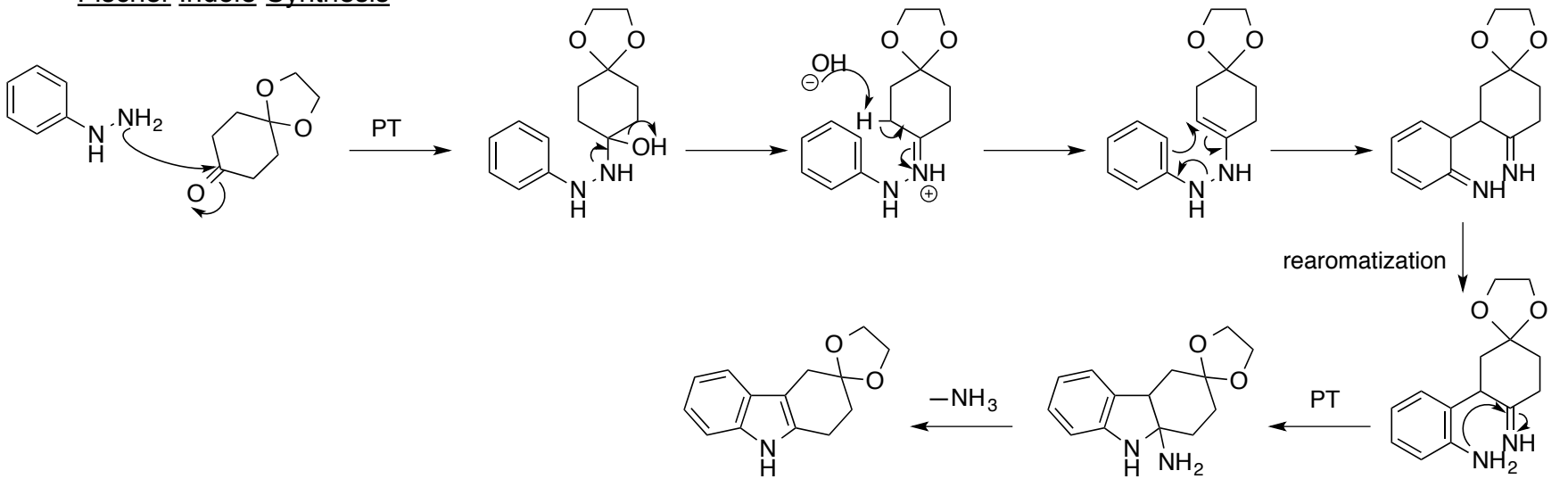
## Retrosynthetic Analysis



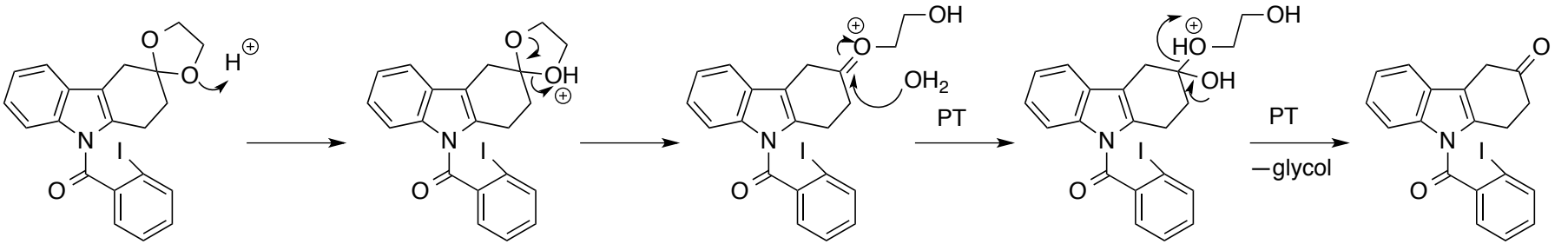
**Preparation of Starting Material 5**



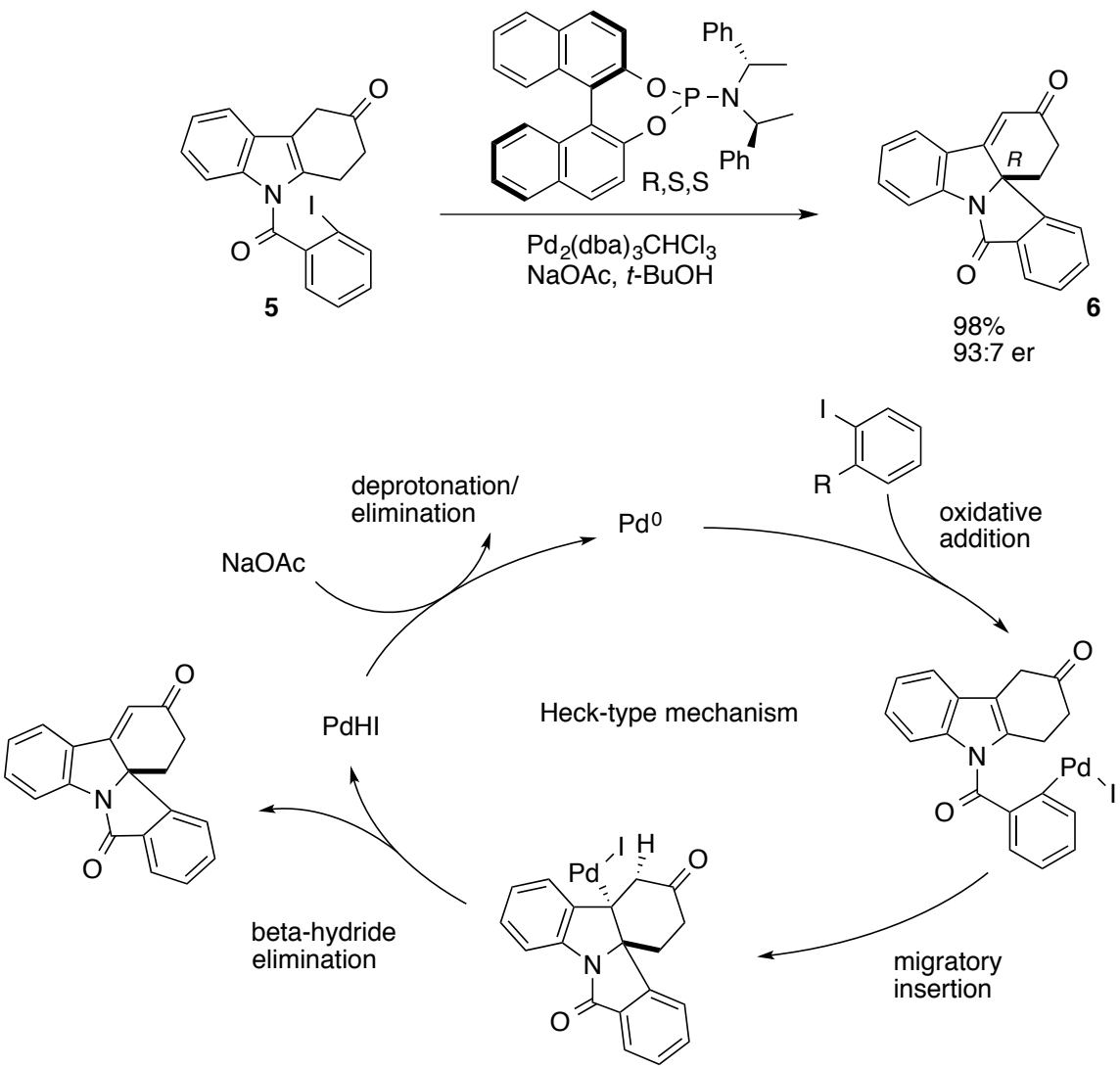

Fischer Indole Synthesis



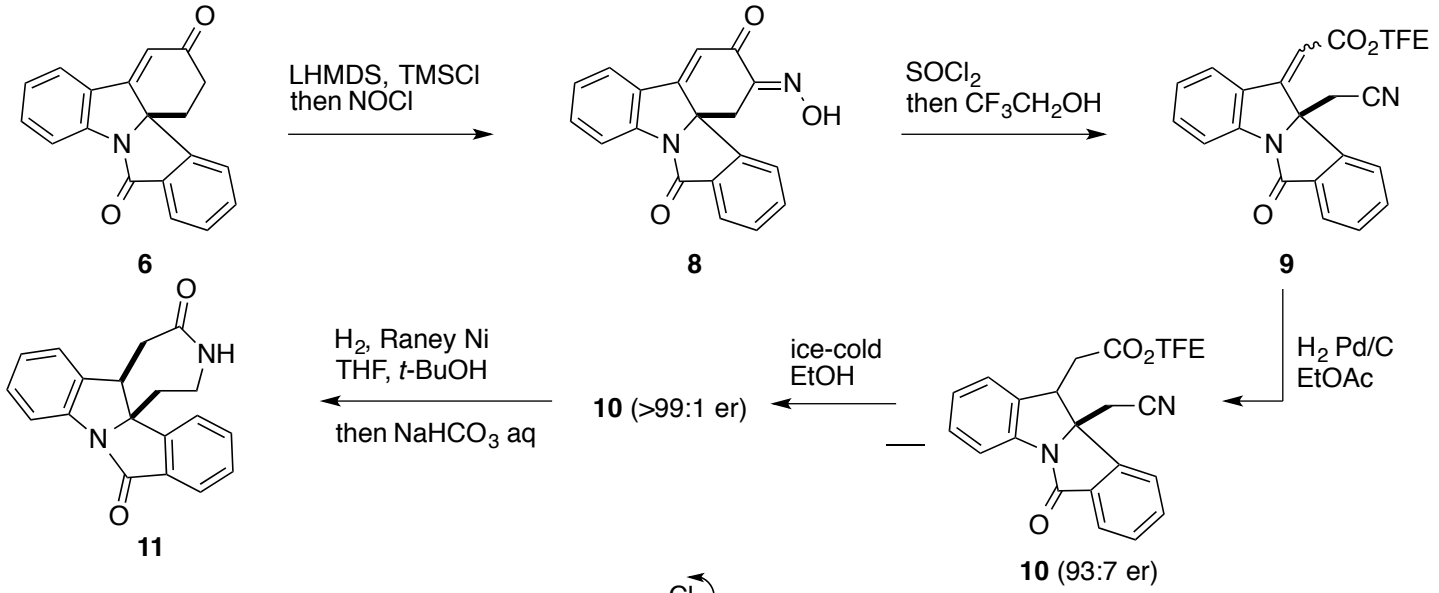

Ketal Deprotection



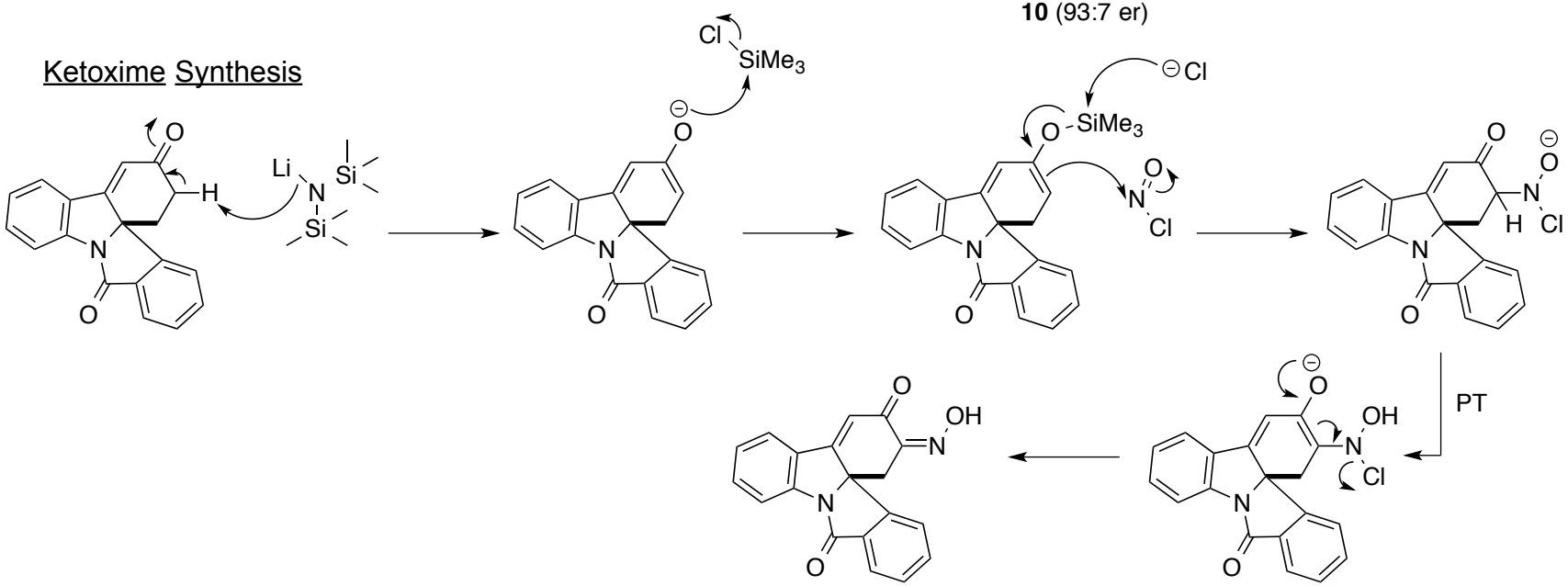
## Palladium-Catalyzed Dearomative Cyclization



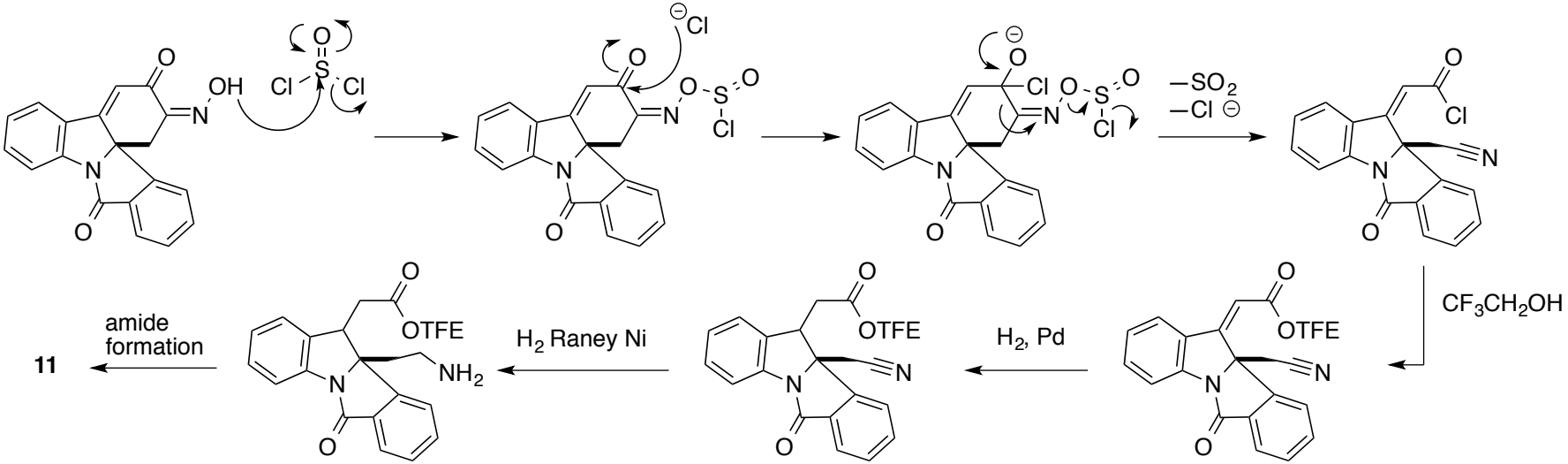
## Construction of Seven-Membered Lactam



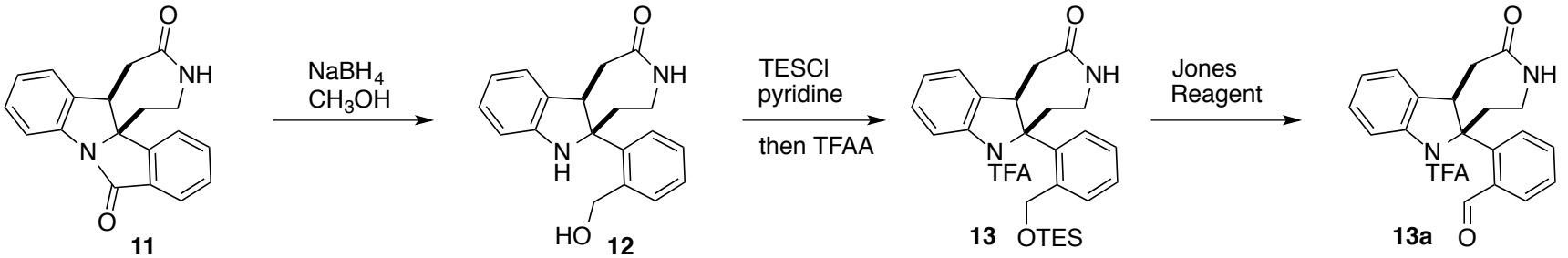

Ketoxime Synthesis



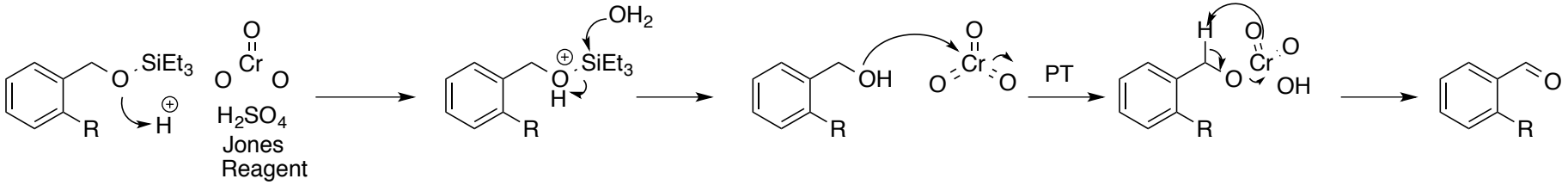
## Beckmann Fragmentation, Hydrogenation, Amide Formation



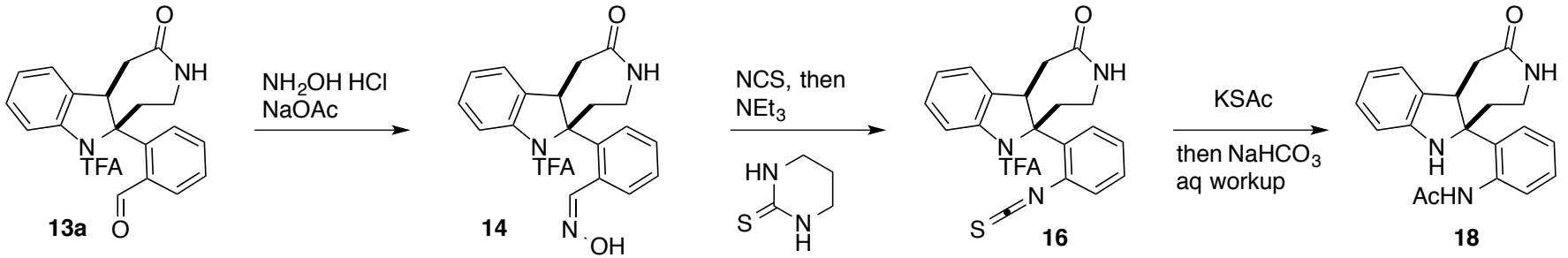

## Conversion of 11 to Indoline/Anilide 2



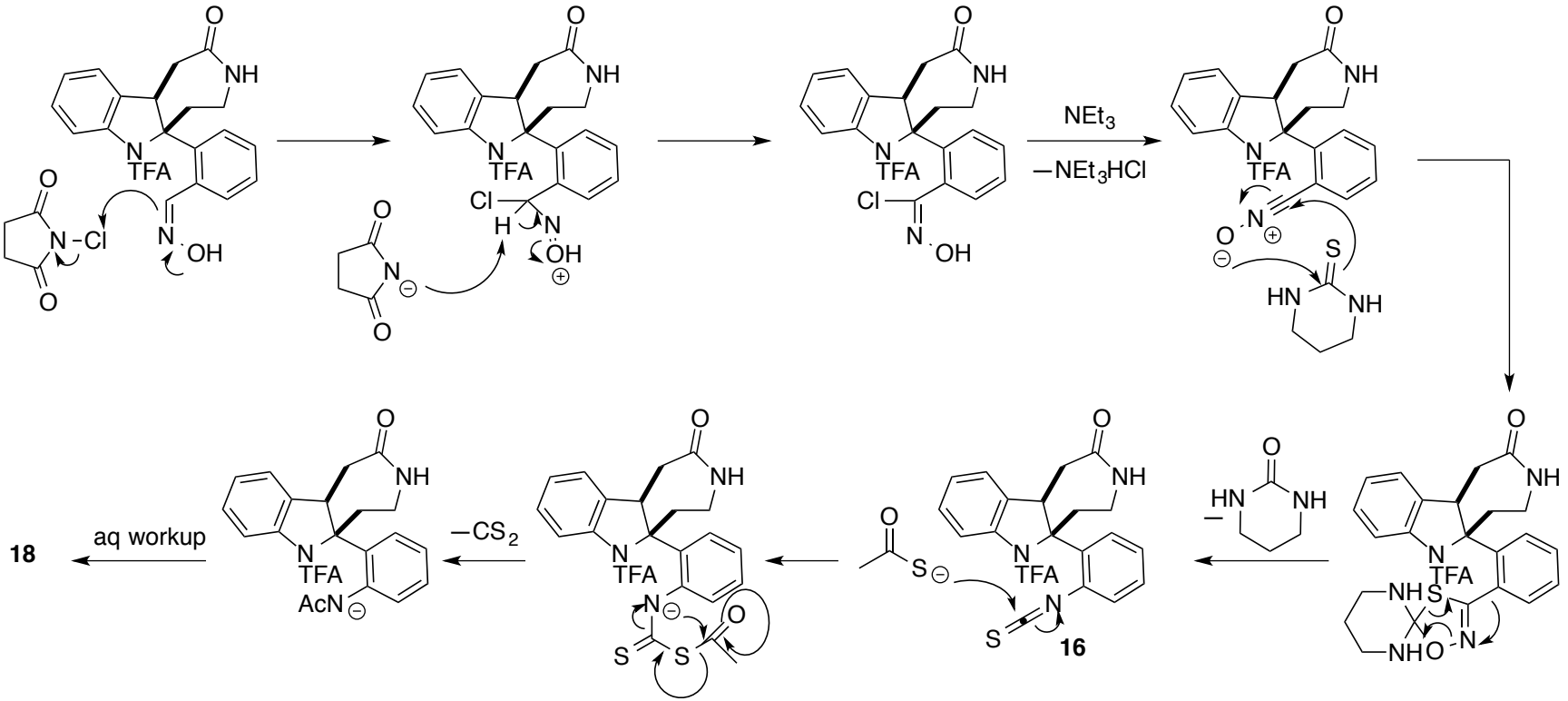

## Oxidation with Jones Reagent



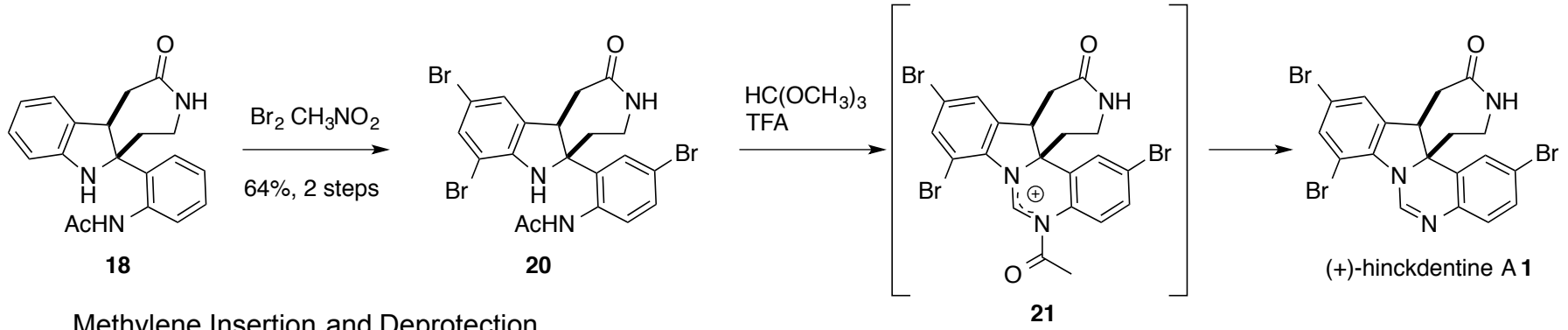
**Conversion of 11 to Indoline/Anilide 2 contd.**



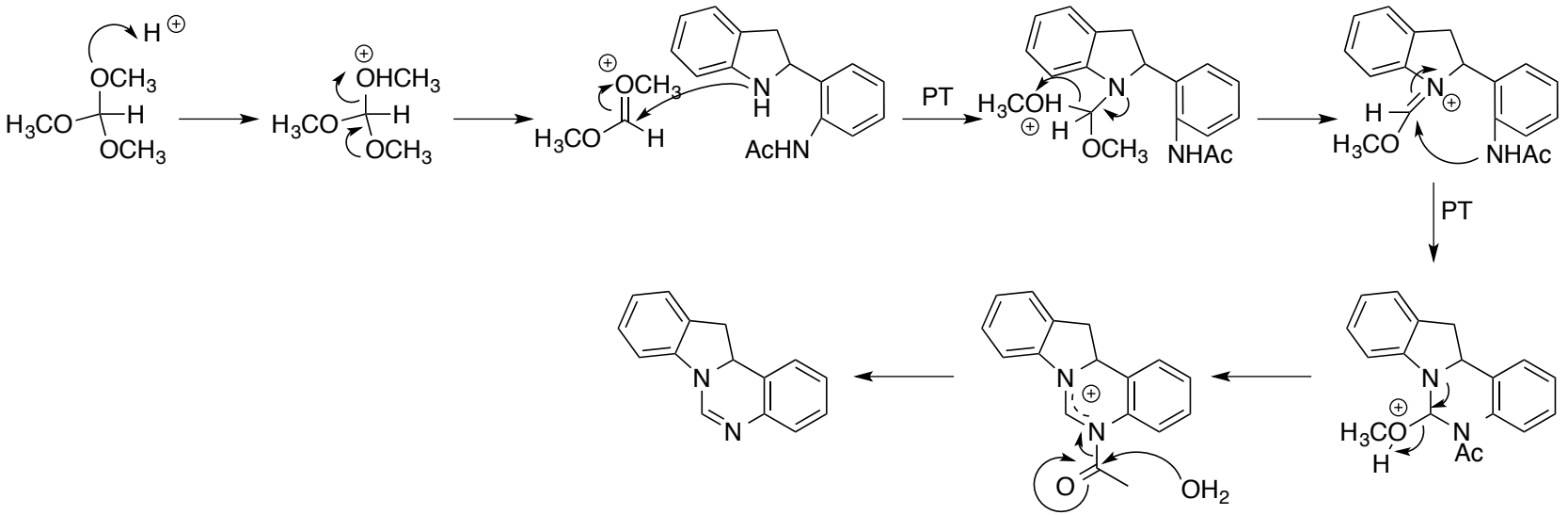

Modified Kim's Protocol



## Tribromination and Forming the Final 5-Membered Ring




Methylene Insertion and Deprotection




## Conclusion

In conclusion, the authors acheived the total synthesis of enantiomerically pure (+)-hinckdentine A in 17 steps from commercially available starting materials. They prepared 300 mg of the target compound in 8.8% yield from intermediate **5**.