

## INTRODUCTION

There are current synthetic methods that produce naphthalenes, but have poor regioselectivity. The Liu lab has recognized the importance of synthesizing regioselective isomers of naphthalenes and their derivatives. The aim is to find new pathways to these important compounds.

I have assisted in this novel research by preparing naphthalene precursors, which can be used in the synthesis of these regioselective isomers.

These types of reactions produce more than one product. For example, the two compounds below could have come from the same reaction. The positions of the R substituents on these two molecules are regioisomers; hence the R substituents are located in different regions on the naphthalene.

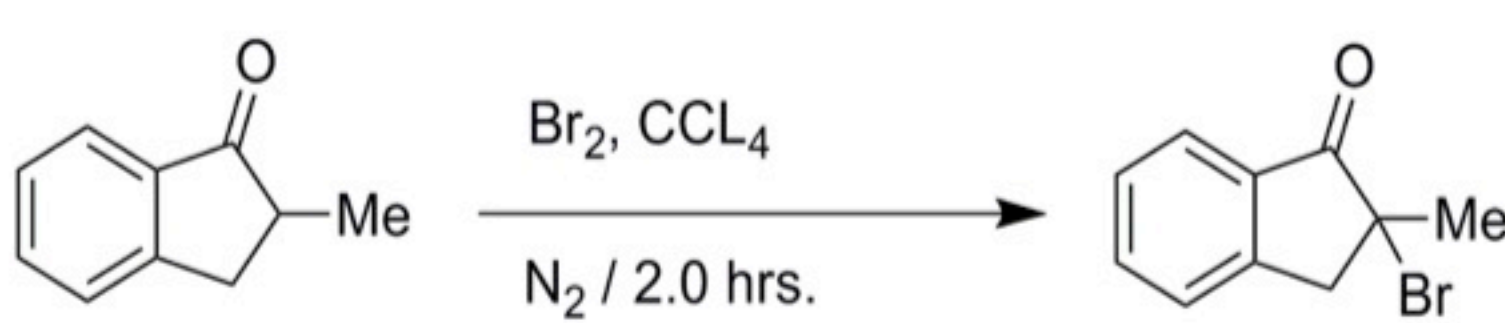


## METHODS

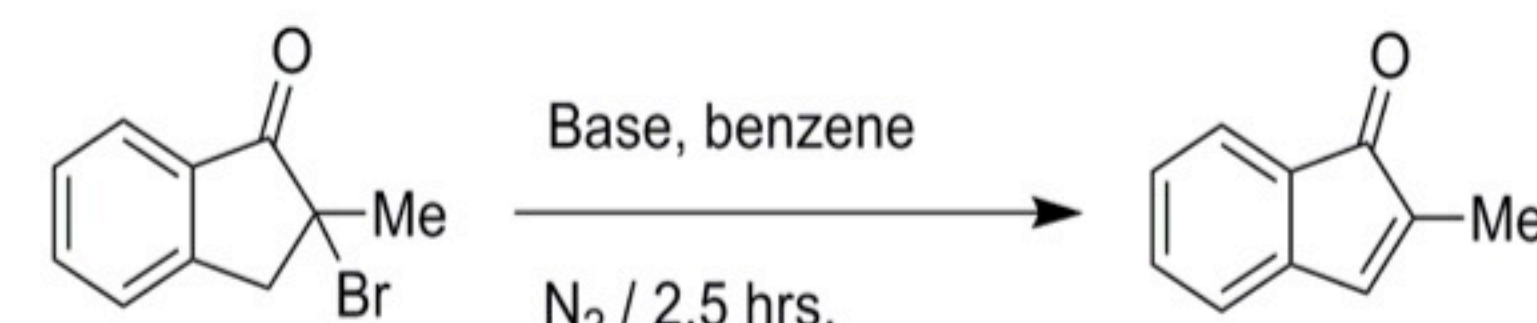
The Liu lab uses a variety of methods to produce regioselective isomers of naphthalene derivatives. In the past, naphthalene derivatives with poor regioselectivity were easily produced.

Now, new synthetic pathways utilizing TMS methyl azide as a key reagent can easily produce desired regioselective derivatives of naphthalene. See the precursor reactions below:

### Bromination of 2-methyl-1-indanone



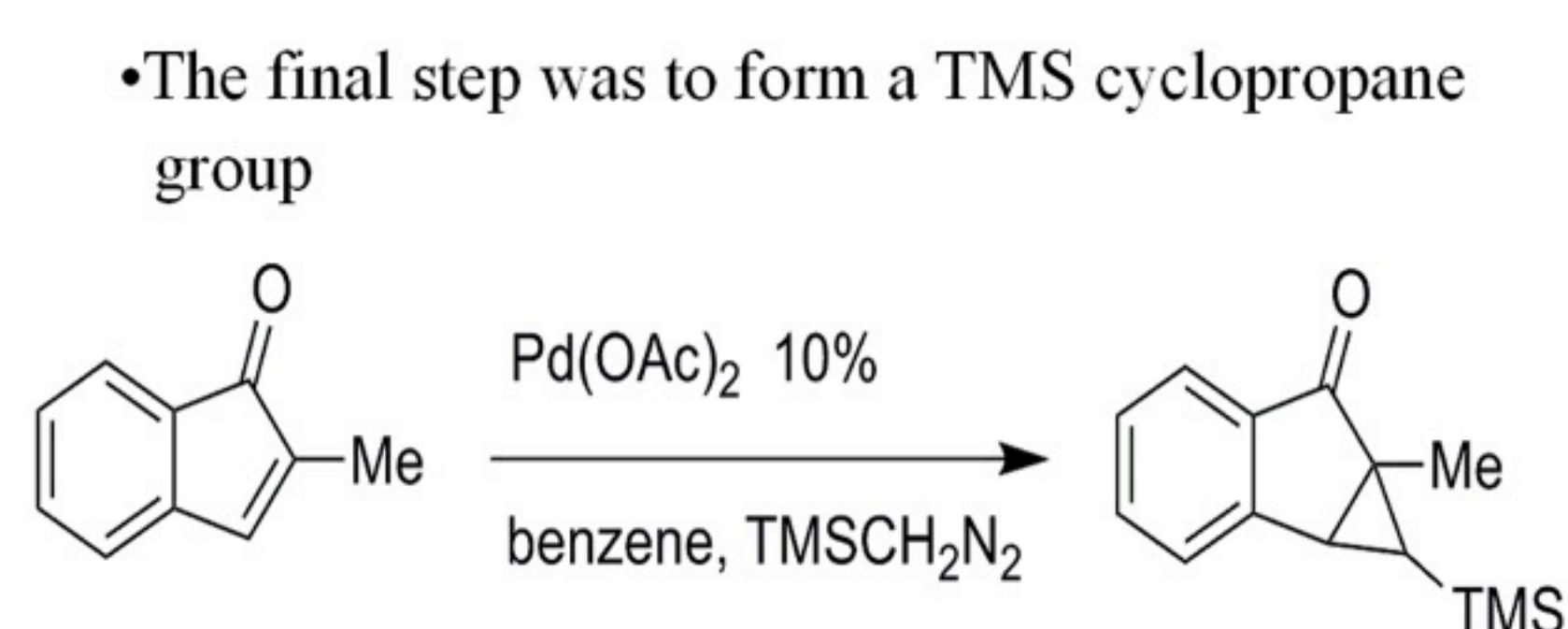
### Halide Elimination



•The first step in reaching the rearrangement end precursor was free radical bromination

•The second step was to form a double bond via elimination

### TMS Cyclization

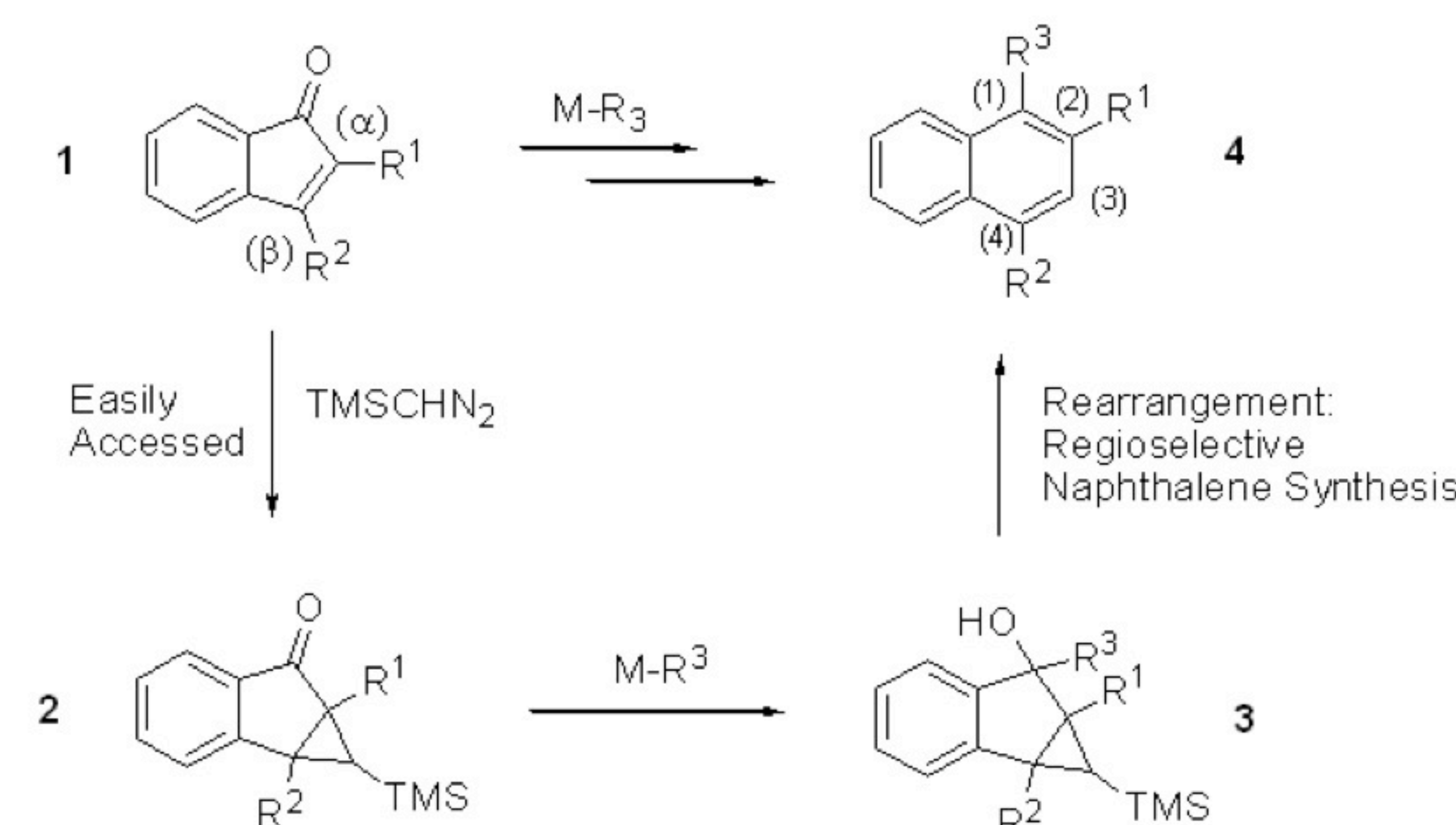


## RESULTS

My contribution aided the Liu lab by producing naphthalene derivative precursors.

The TMS methyl azide precursors undergo rearrangement synthesis to produce desired regioisomers of naphthalenes.

## Generic Reaction Scheme



## CONCLUSIONS

Attending U-Core is a valuable experience for undergrads such as myself.

Research work is fun, although, sometimes it is difficult, but I found perseverance pays off.

The lab techniques that I have learned have given me an edge while applying for graduate school or research type internships.

U-Core has given me an opportunity to:

- Meet new people
- Contribute to a project as a team player
- Learn lab techniques, which employ the use of sensitive instruments such as Nuclear Magnetic Resonance (NMR)

## FUTURE DIRECTIONS

The Liu lab aims to improve yields, synthesize new naphthalene derivatives, and uncover mechanism pathways for these reactions.

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