

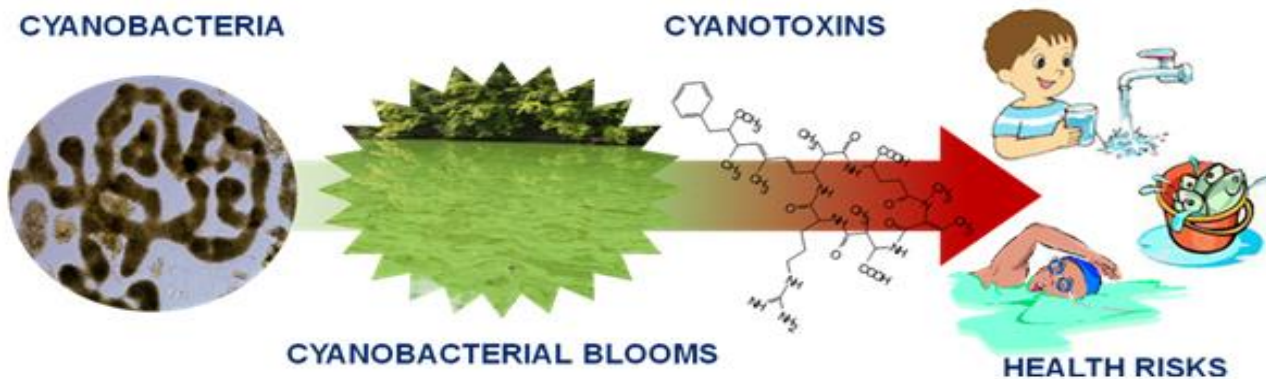
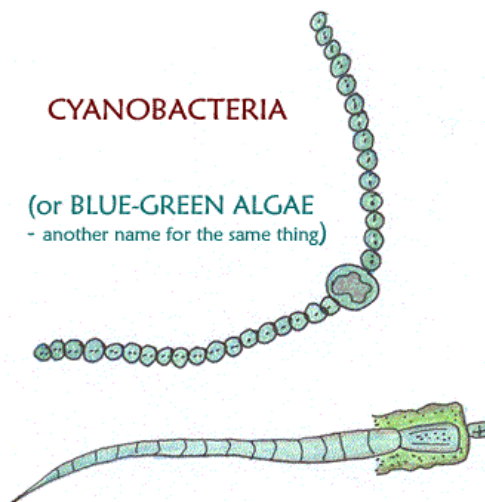
# Improving the Methodology for Complex Molecules

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Alexandra Barajas

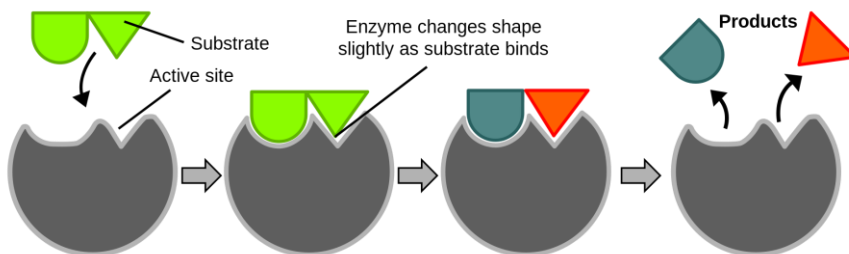
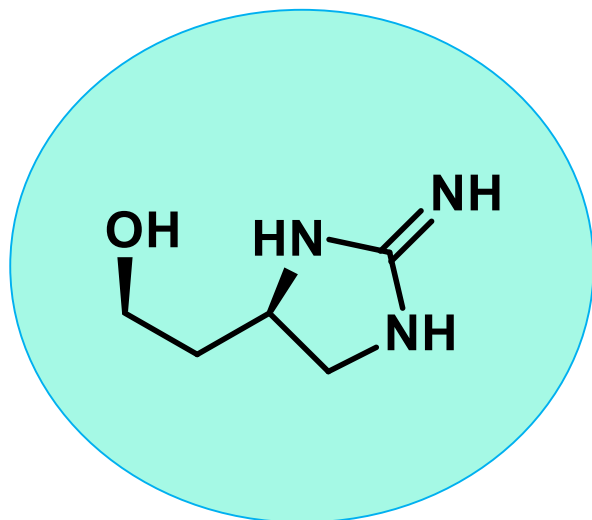
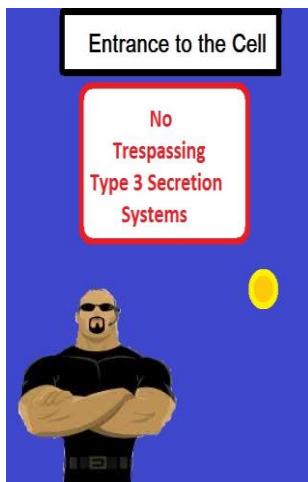
Zakarian Group  
UC Santa Barbara

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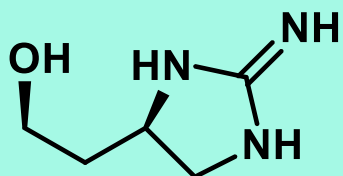


# Numerous Natural Compounds contain the Cycloguanidine Moiety

## The Guanidine Moiety



# Guanidine Moiety is Part of Larger Framework



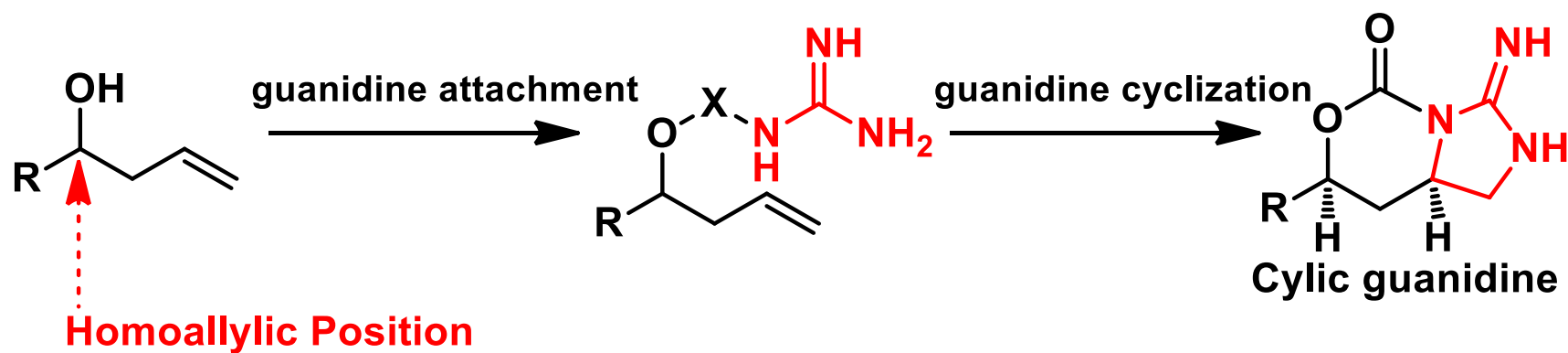
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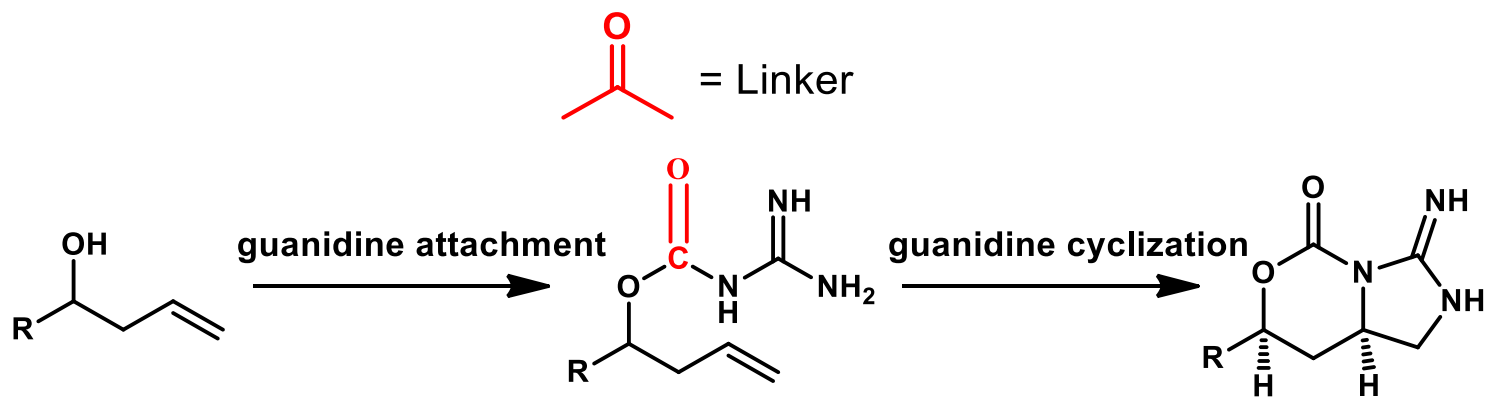
The Guanidine Moiety



## What We Plan on Doing



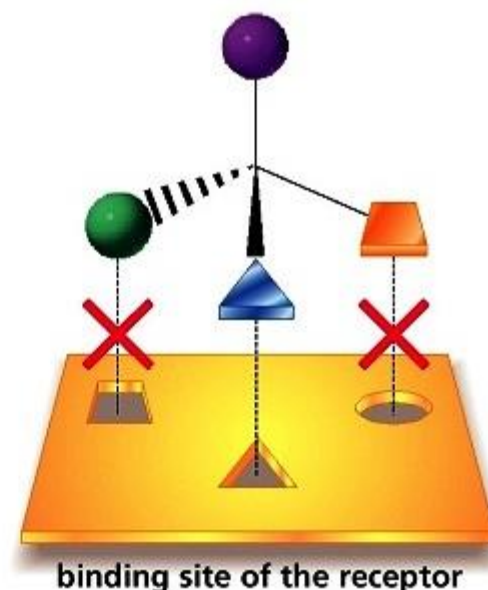
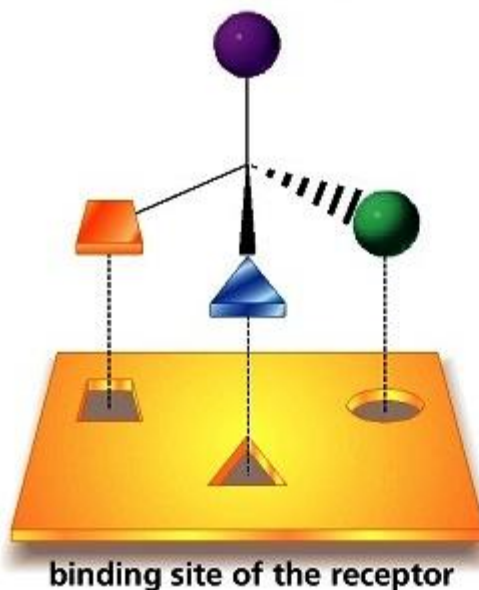
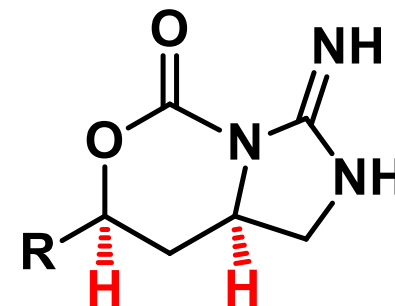
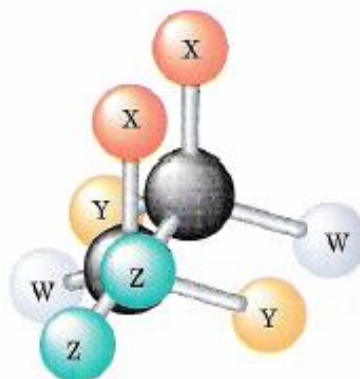
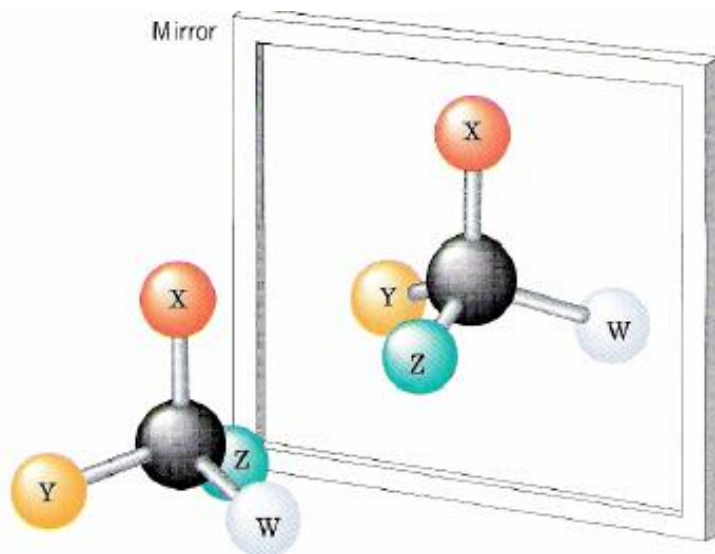
# Linking Our Homoallyl Alcohol to Guanidine



- We need a way to link guanidine to the homoallyl alcohol
- We use the carbonyl group as a linker!



# Importance of Cyclization: Stereoselectivity





# Our Methods for our Methodology are Like a Recipe



Step 1: Putting two and two together



Step 2: Letting Chemistry take its course



Step 3: Purifying your compound  
“workup”

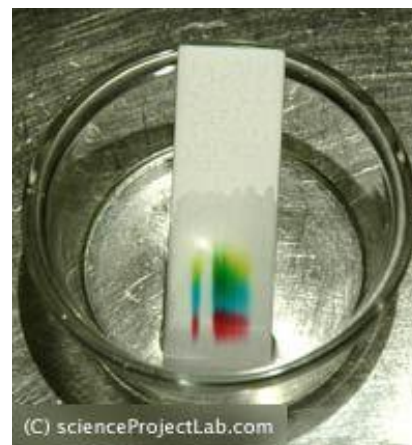
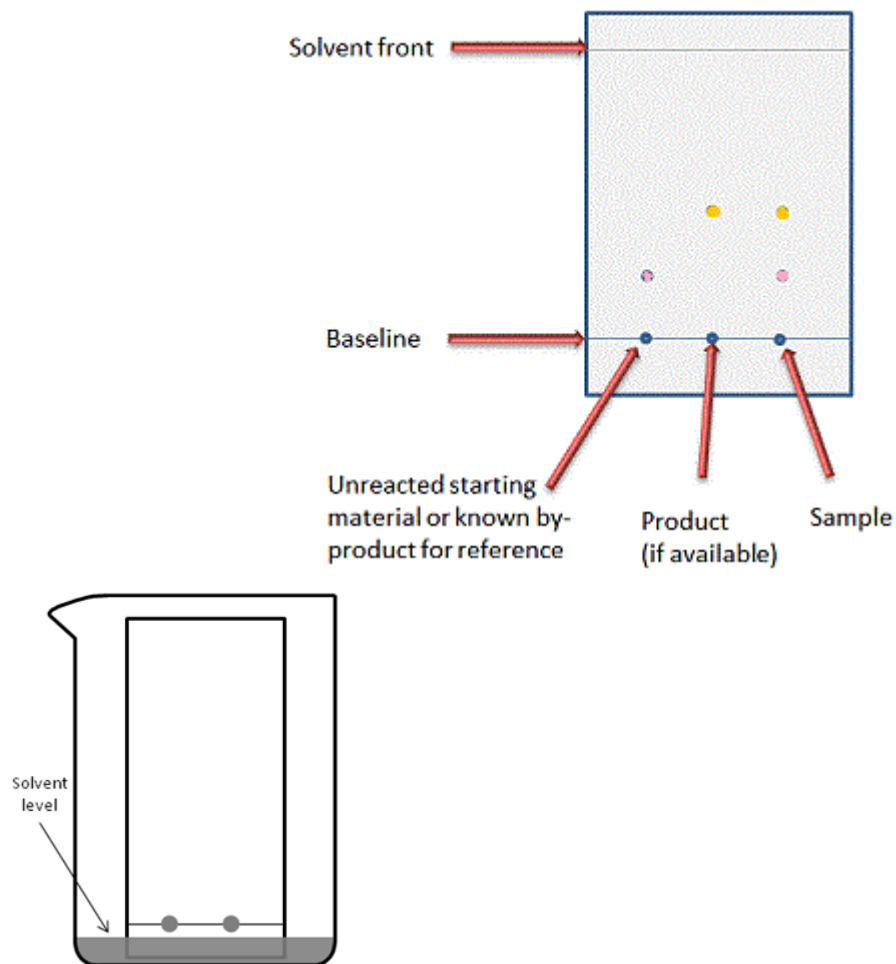


Step 4: Analysis



# Chromatography is a Way to Determine Ability to Purify Compound

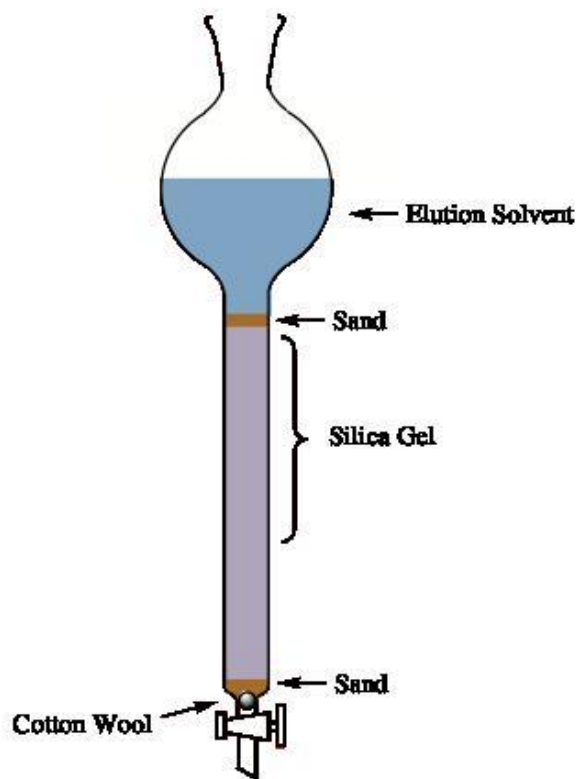
## TLC: Thin Layer Chromatography



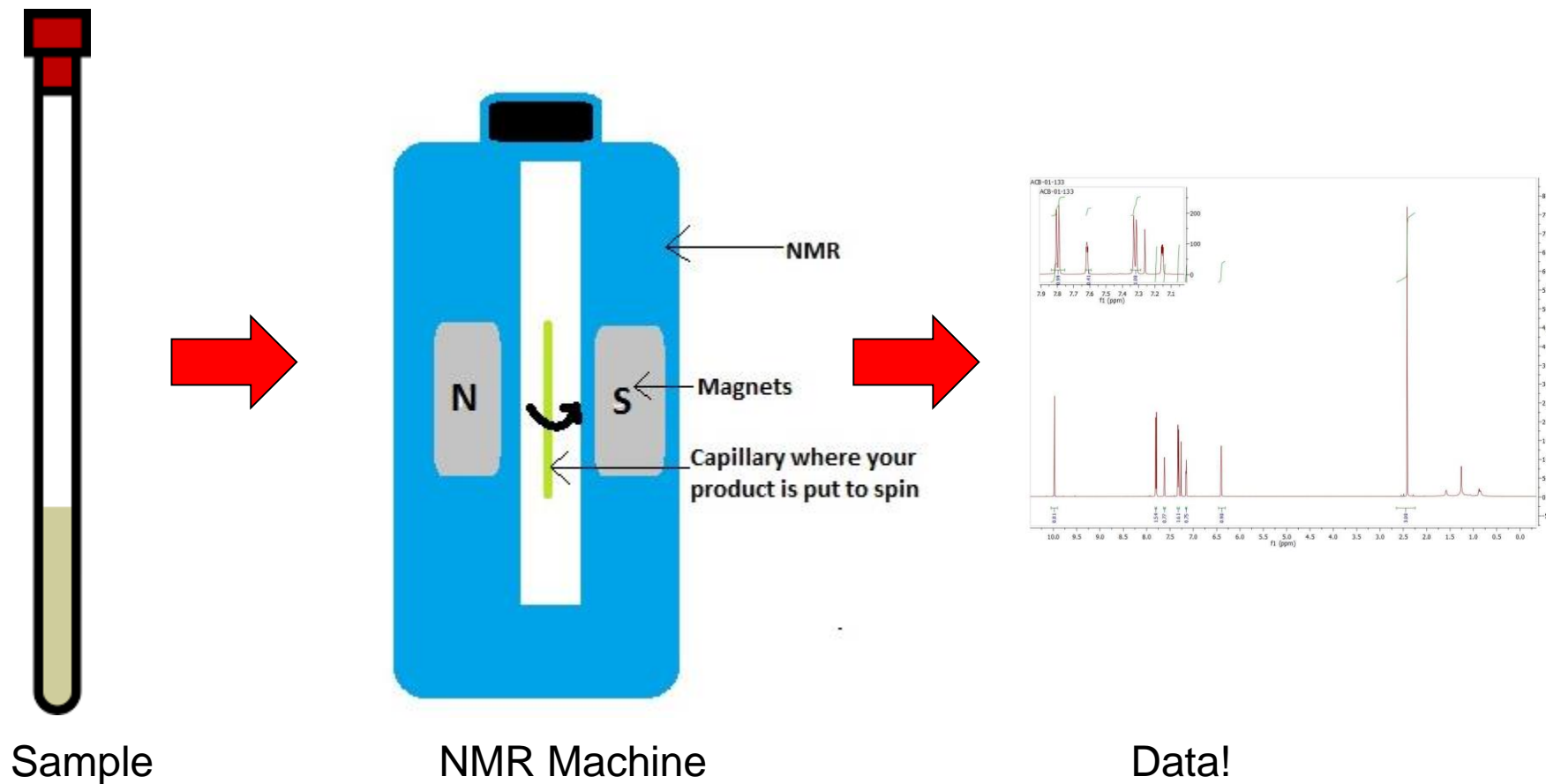
# Chromatography is a Way to Purify your Compound

## Column Chromatography

Flash Chromatography Column

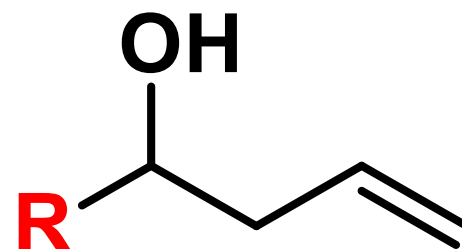


# Determining the Structure of the Compound by NMR



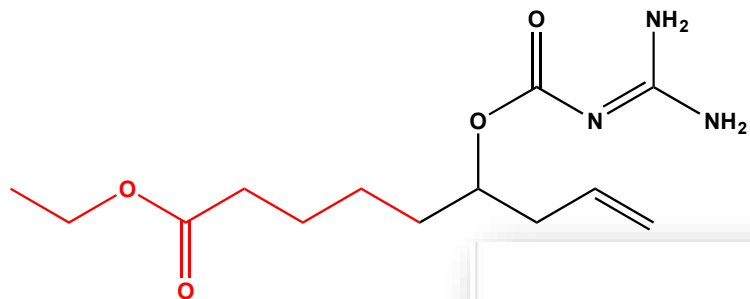
NMR= Nuclear Magnetic Resonance

## Determining How Well Different Functional Groups Respond to Our Method



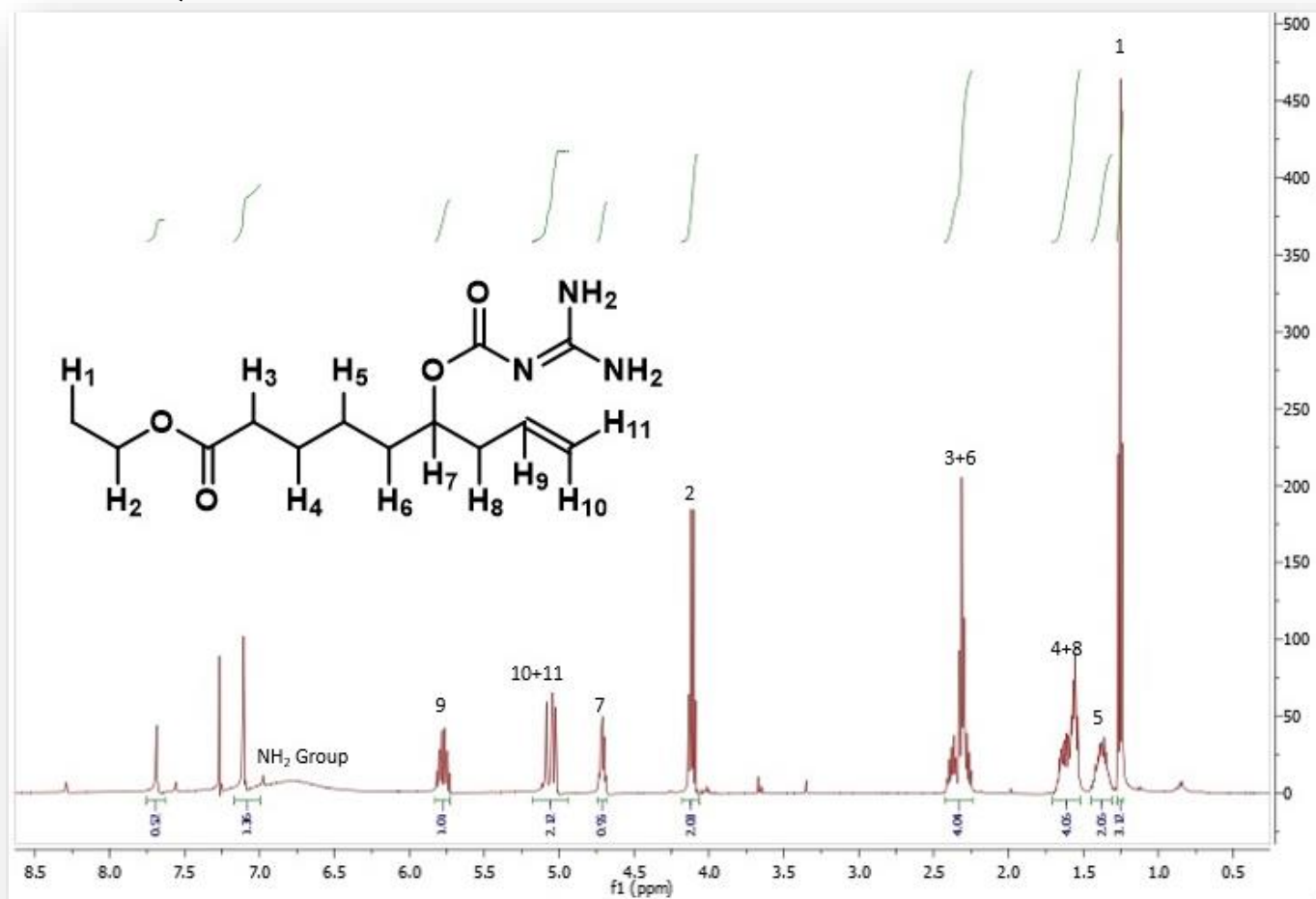
- How well will this go together?

# The Ester Substrate

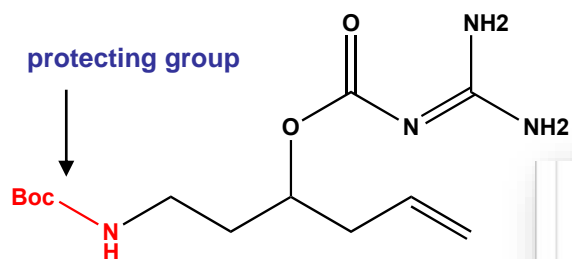


## Esters

66% Yield for  
Introduction  
of Guanidine

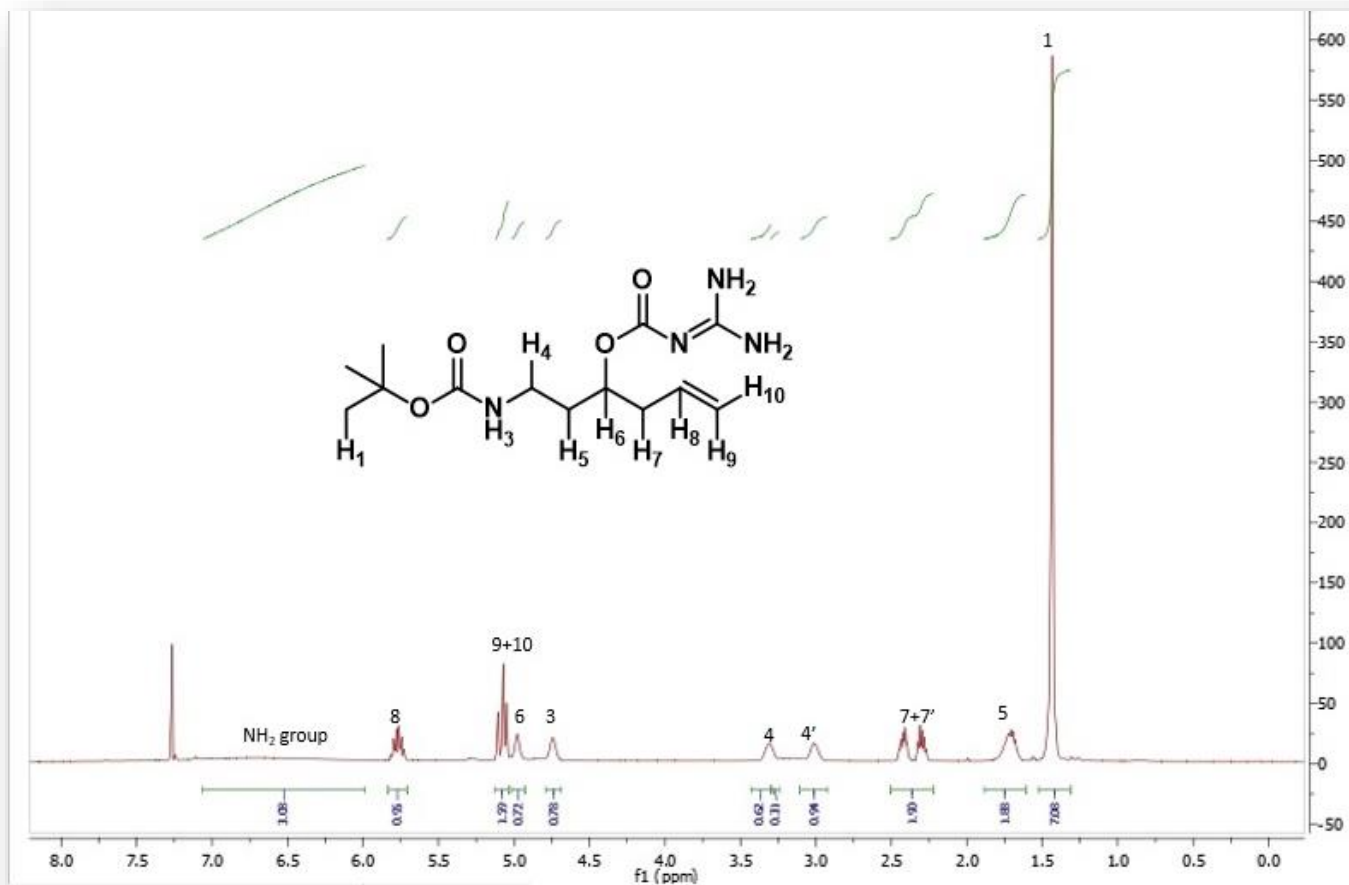


# The Protected Amine Substrate

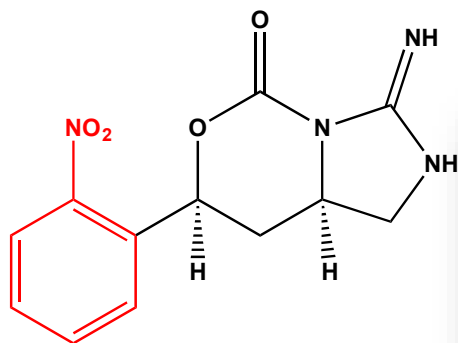


## Protected Amine

90% Yield for  
introduction of  
Guanidine



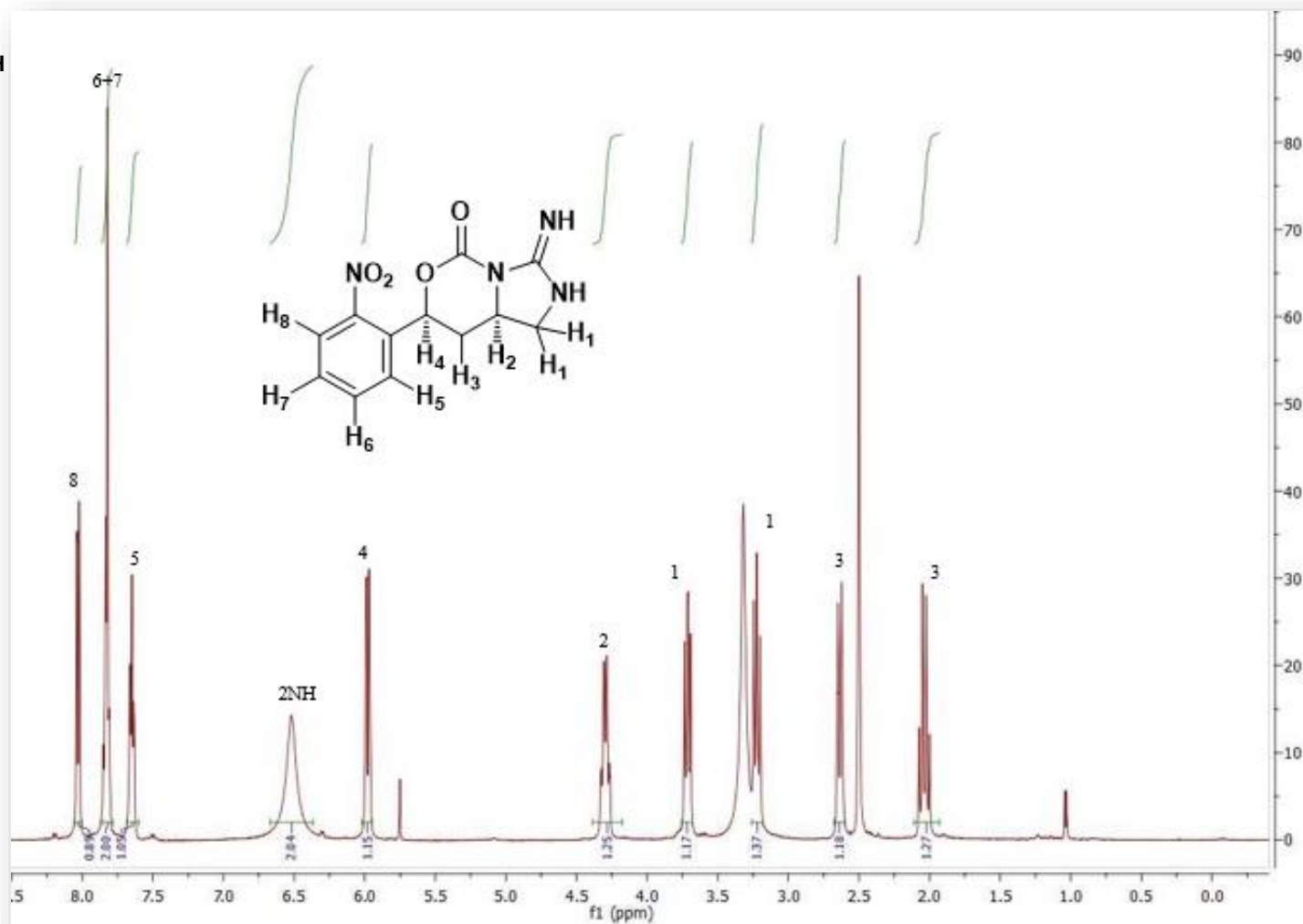
## The Nitro Substituted Compound Resulted in a Good Yield and Purity



**Nitro-substituent**

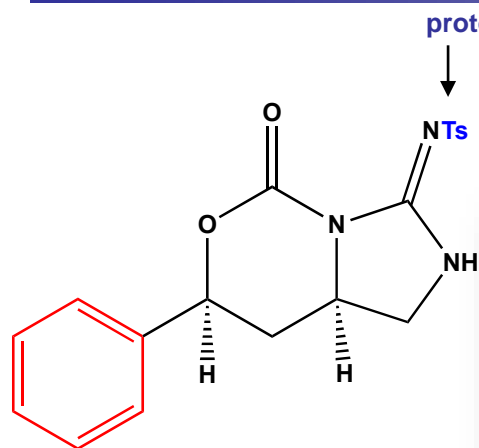
30.3.% For  
Introduction of  
Guanidine

50.7% Yield  
for Cyclization





# The Complete Synthesis and Protection of Aromatic Compound

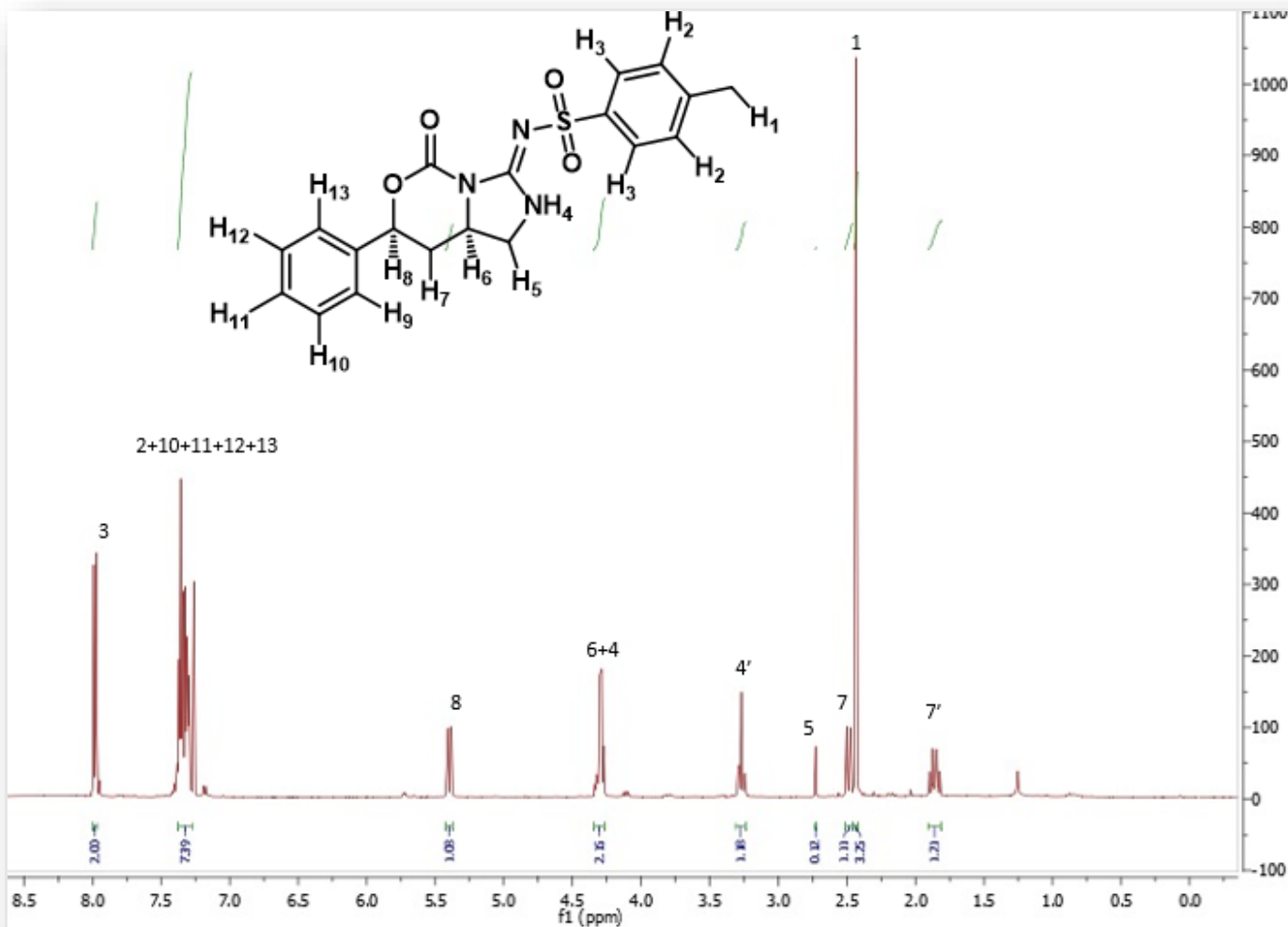


**Aromatic**

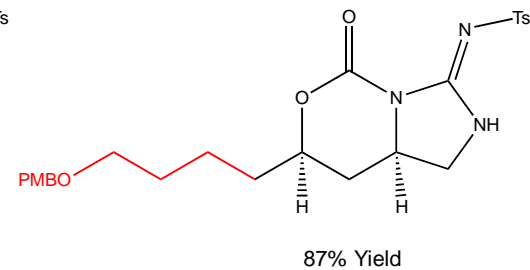
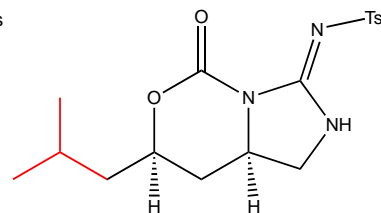
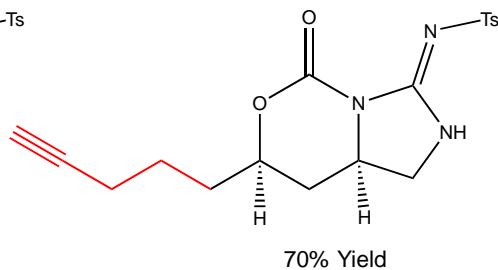
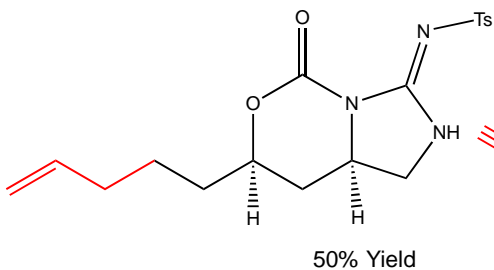
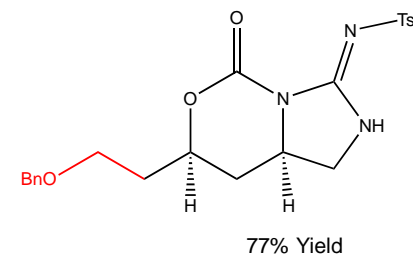
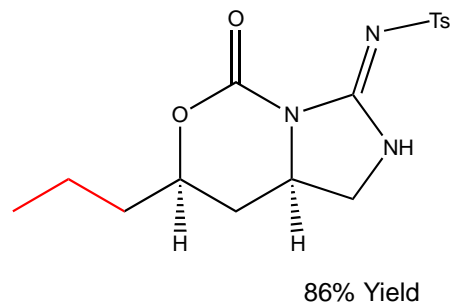
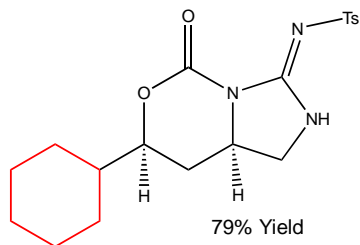
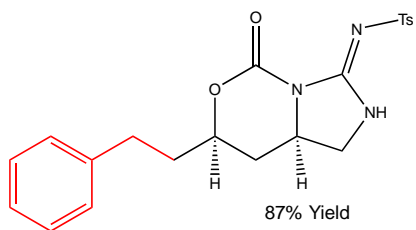
100% Yield for  
introduction of  
guanidine

40.2% Yield for  
Cyclization of  
Guanidine

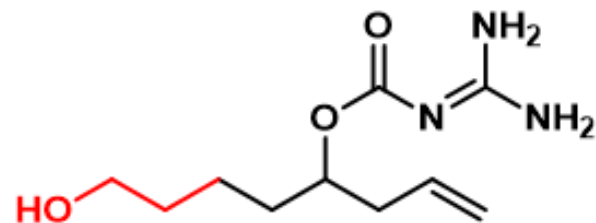
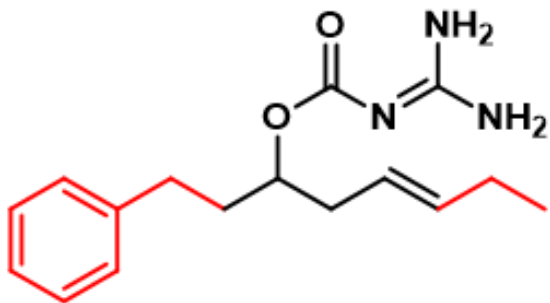
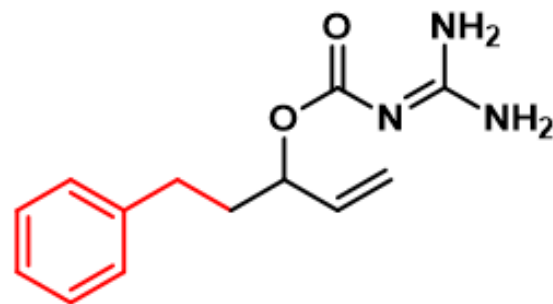
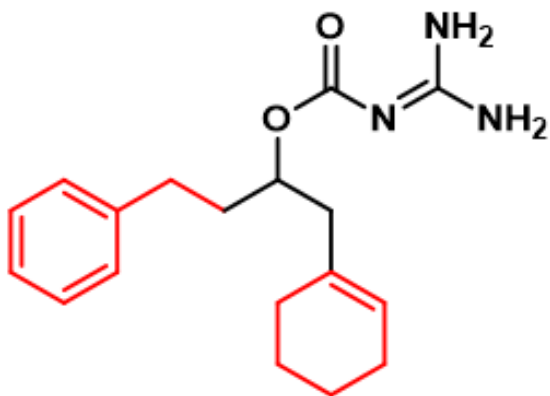
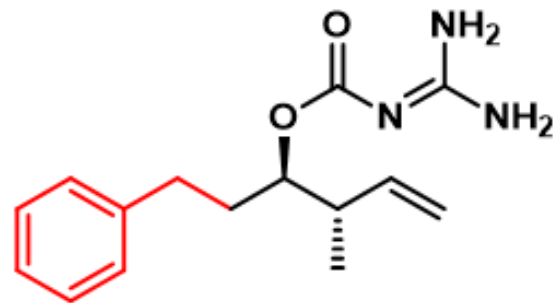
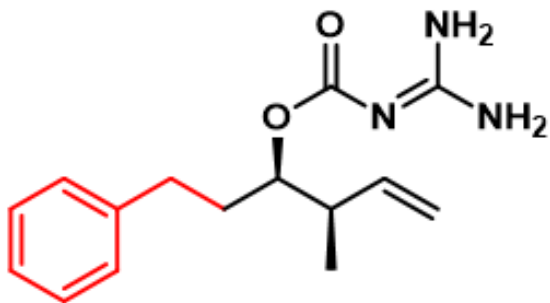
32.6% Yield For  
Protection



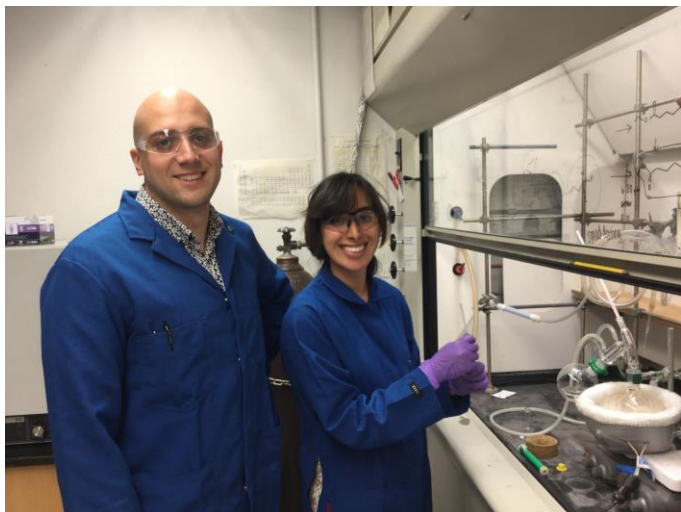
# Previously Cyclized Compounds



# Future Syntheses



# Many Thanks!



**MARC**  
MAXIMIZING ACCESS TO RESEARCH CAREERS

