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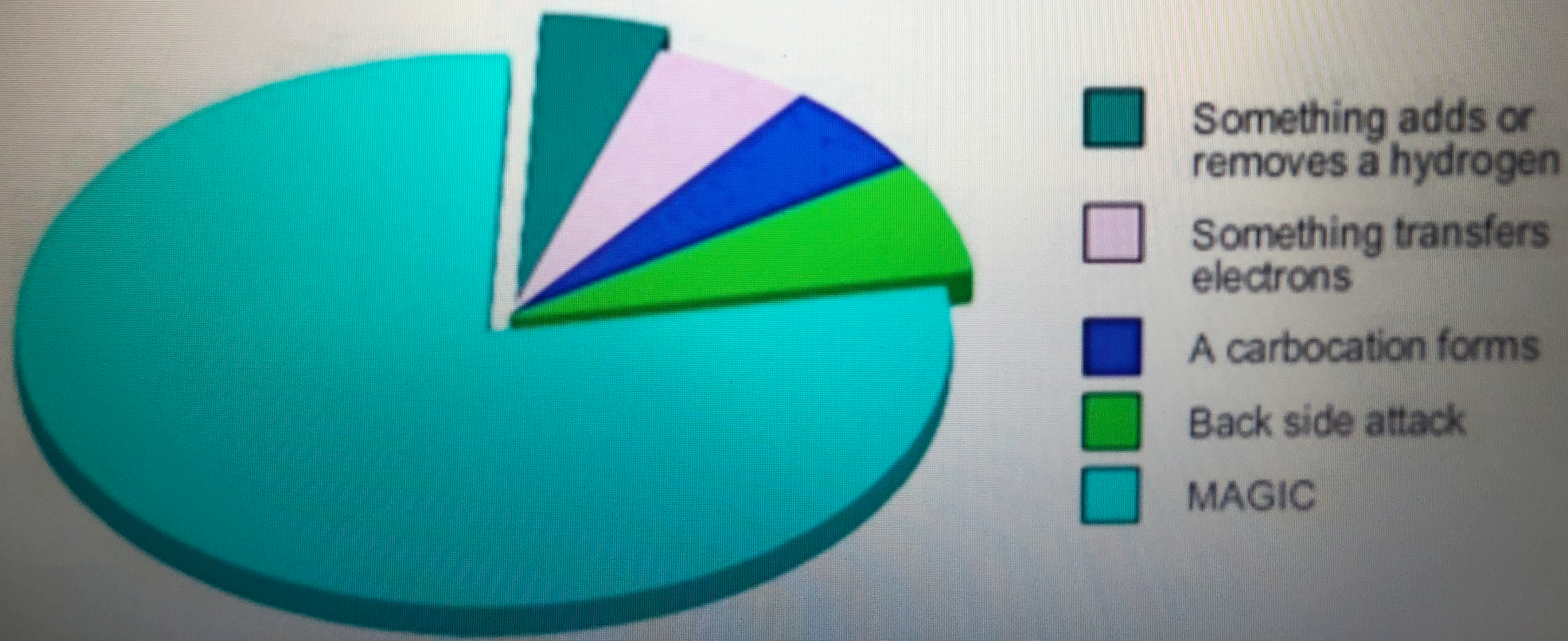
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**BRIAN WANG**

**SARPONG GROUP**



# How Organic Chemistry Reactions Work





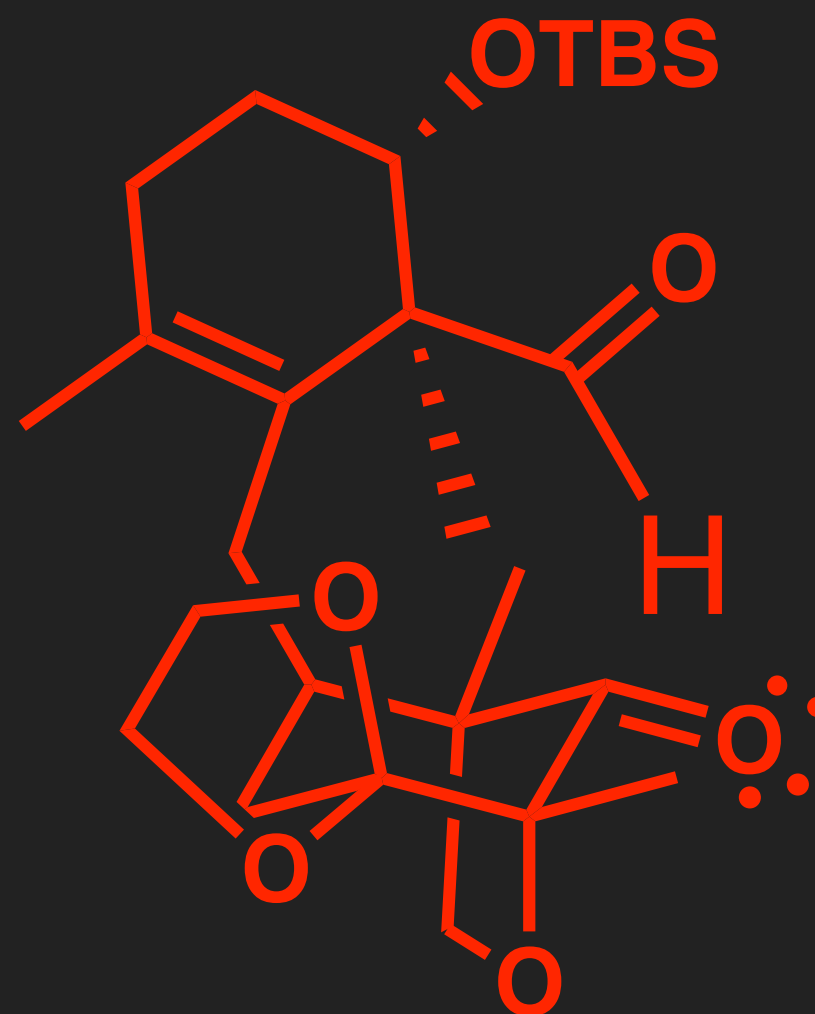
# ROADMAP

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1. Remote Mentoring Experience
2. On-site Lab Experience
3. How this all fits into my future interests

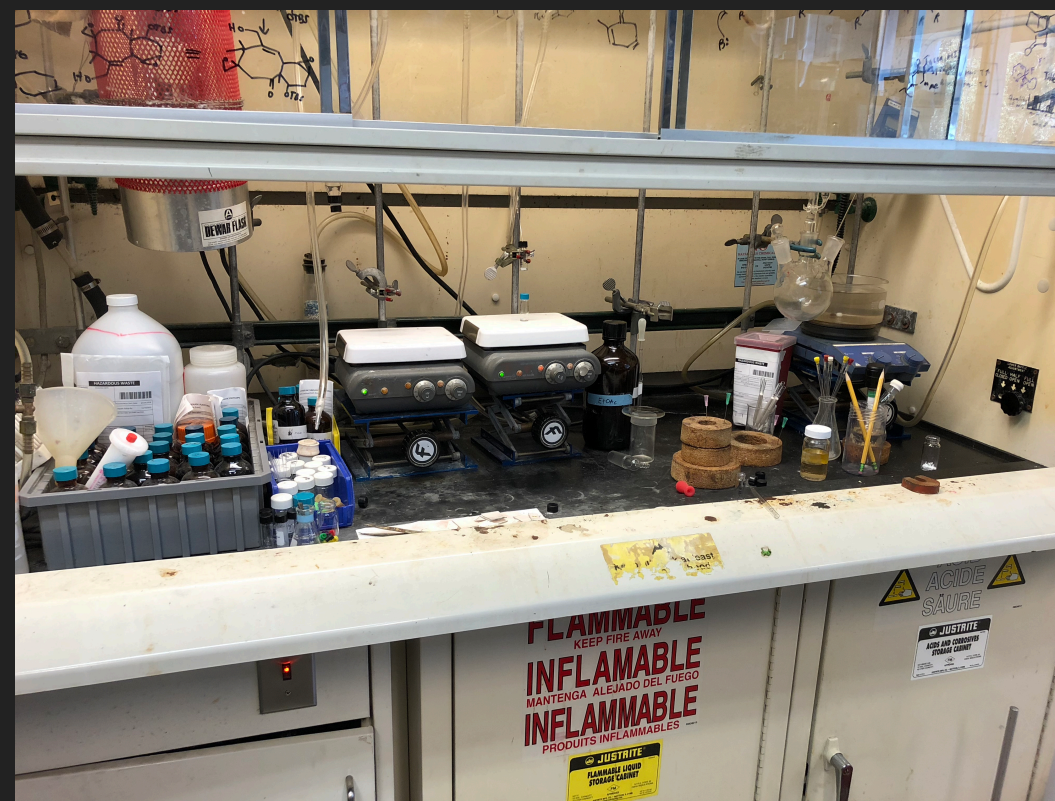
# ORGANIC CHEMISTRY

- ▶ Chemistry concerning the element carbon and the compounds it forms.
- ▶ Organic chemistry is important for purposes of understanding life.
- ▶ Carbon has the unique ability to form four chemical bonds which gives it flexibility to develop into rings and other structures.
- ▶ Thus it has a paramount importance





# TOTAL SYNTHESIS



- ▶ TOTAL SYNTHESIS HAS TO DO WITH THE CREATION OF CHEMICAL COMPOUNDS MANUALLY BY A PERSON
- ▶ ORGANIC TOTAL SYNTHESIS IS THE CREATION OF ORGANIC COMPOUNDS BY A PERSON



# A TYPICAL REACTION

Note: A specific reaction along with mechanisms and reagents must be well thought out first before doing any of these steps.

1. Set Up- Gathering materials and configuring reaction environment.
2. Monitoring- Watching a reaction's progress. TLC (Or LCMS)
3. Work-Up- Quench the reaction mixture in order to remove impurities
4. Purification- Separating the product you want from the crude reaction mixture
5. Analysis/Characterization- Finding the exact structure you got.

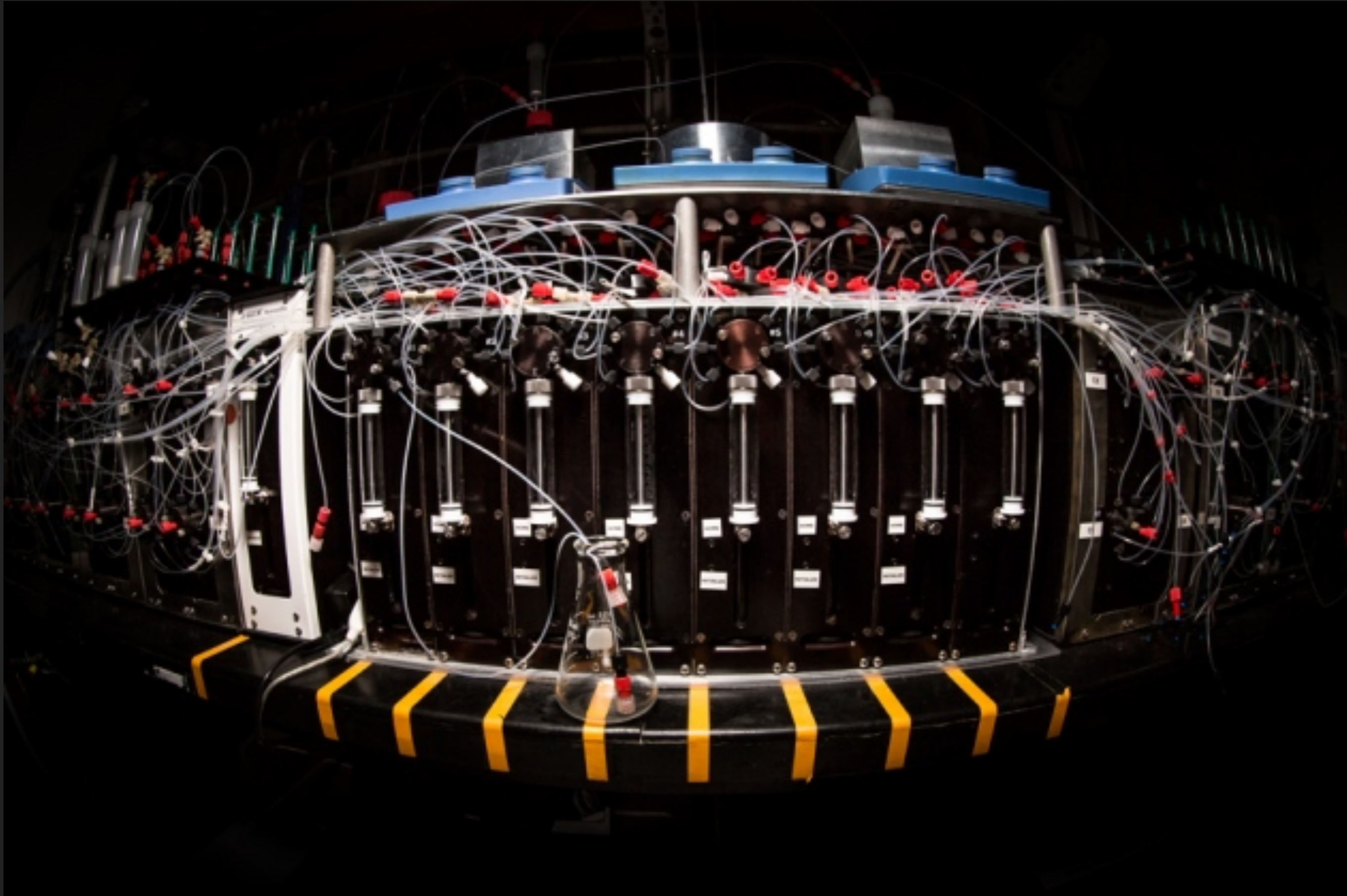




# FUTURE OF TOTAL SYNTHESIS

- ▶ In general, notable research has shifted from total synthesis to other fields within chemistry and biology.
  - ▶ More specifically, total synthesis as a field has been dying. A lack of funding and interest in applications based research rather than basic research has fueled this decline.
  - ▶ A new development in A.I. has come to scare chemists as this could possibly replace them if it can do their job completely.
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- ▶ A.I. has been developed that rely on rules of organic chemistry in order to predict the most efficient reaction pathway.







# LAB EXPERIENCE

BRIAN IS THE BEST  
MENTOR EVERRRRR!!!!



My lab experience involved me shadowing Brian and watching him run various reactions. Additionally I learned how to write a reaction mechanism and had exposure to retro synthesis (←—This sounds really cool...)

# ORGANIC CHEMISTRY MECHANISMS

In drawing mechanisms you basically draw arrows to move electrons without violating the octet rule (few exceptions), without showing things that can't happen (hydrogen won't leave on its own), without drawing flawed structures (carbon has a -1 charge instead of oxygen – again few exceptions).

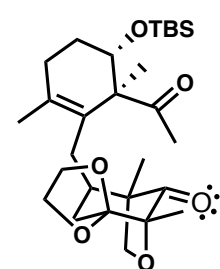
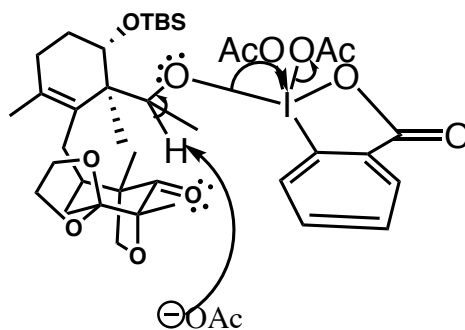
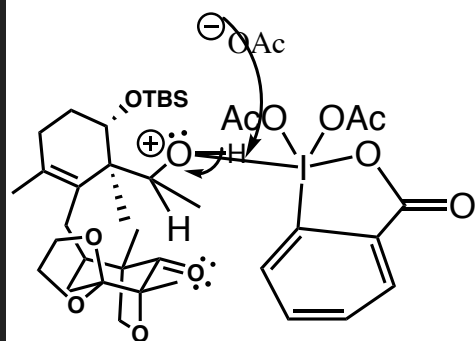
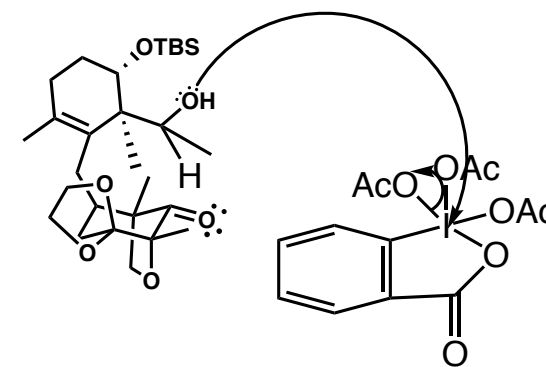
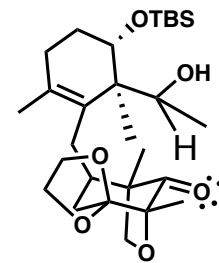
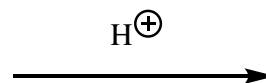
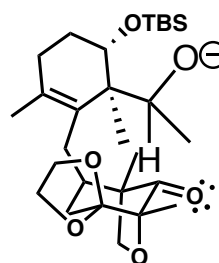
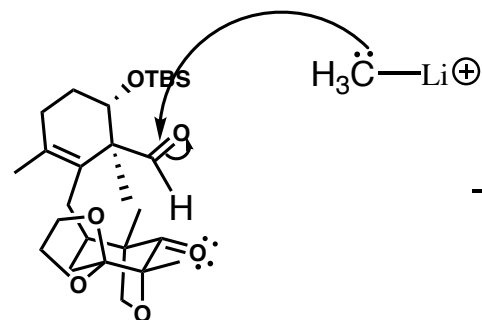
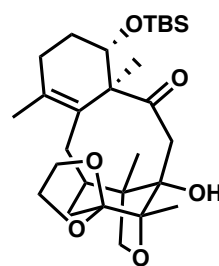
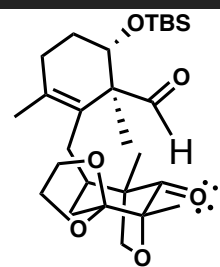
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## ORGANOMETALLIC CHEMISTRY

Intersection of organic and inorganic chemistry. The chemistry of metal compounds as they interact with carbon compounds.

Note: should be a direct interaction with carbon otherwise it could be a coordination compound not an organometallic compound







# HOW THIS CAN BE APPLIED TO MY FUTURE INTERESTS

- ▶ Thanks to the program I have now decided on an MD-PHD rather than just an MD. Sure its a few more years of work but what is life without challenging endeavors.
- ▶ I will get the MD to make my dad happy and the PHD to make Brian happy. Just Kidding- I genuinely want to do it because I want to do it.

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The lab experience helped me decide on this route. I like medicine but I also really like being in the lab and seeing the wonderful research that is being done. The problem-solving and complications that can arise from running reactions can be annoying but in the end it is still really interesting to me.

Yes, I care about Brian's feelings!



# CONCLUSION

"I have learned this at least by my experiment that if one advances confidently in the direction of his dreams, and endeavours to live the life which he has imagined, he will meet with a success unexpected in common hours."

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"What you get by achieving your goals is not as important as what you become by achieving your goals"



# ACKNOWLEDGMENTS

THANKS TO **SUZANNE** FOR THIS OPPORTUNITY

THANKS TO **BRIAN** FOR BEING EXTREMELY NICE TO ME AND PATIENT WITH ME AND FOR BEING ONE OF THE BEST TEACHERS I HAVE EVER HAD(I KNOW I MAKE A LOT OF MISTAKES LOL)

THANKS TO **MEL** FOR LETTING ME SHADOW HIM FOR THREE DAYS AND FOR BEING REALLY NICE TO ME

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