



UNC  
SCHOOL OF MEDICINE

# How to Apply to Graduate School... and be Competitive

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# Today's Discussion

- My Credentials
- To Be Competitive, you have to understand the Graduate Program & Admissions Process
- What are Admissions Committees looking for in the Application Materials...
- How can your summer research experience help...

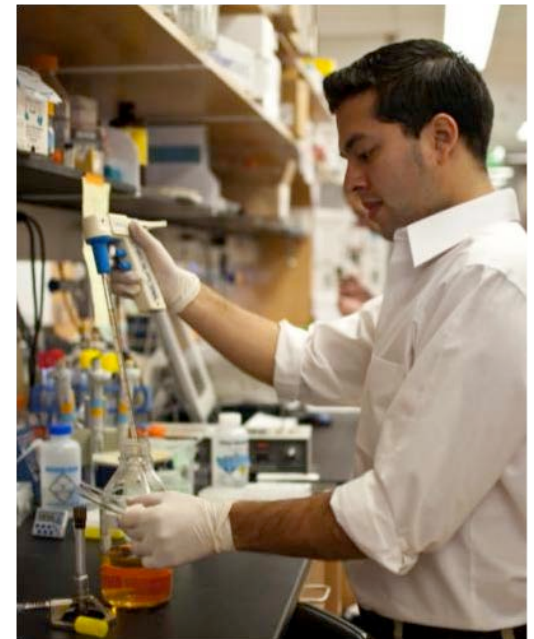
# About Me...

- B.S. – LSU, Biochemistry
- Ph.D. – UNC-Chapel Hill, Cell & Developmental Biology
- Teaching– UNC-CH: Genetics, Dev Bio
- Now
  - » Direct the Academic & Career Excellence Program at UNC
    - Providing academic support for graduate students in courses, for qualifying exam prep, and to enhance critical analysis skills
    - Monitor and enhance success of IMSD students
  - » Direct the Lab Skills BootCamp for incoming PREP scholars
  - » Direct the Summer of Learning and Research (SOLAR) program

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- 1 Umbrella program is the entry mechanism → 14 PhD programs
- 300+ active research faculty affiliated with these 14 programs
- Many additional training programs



# BBSP Students Join a Program

- Biochemistry & Biophysics
- Bioinformatics & Computational Biology
- Biology
- Cell & Developmental Biology
- Cellular & Molecular Physiology
- Chemistry
- Genetics & Molecular Biology
- Microbiology & Immunology
- Molecular & Cellular Pathology
- Neurobiology
- Oral Biology
- Pharmaceutical Sciences
- Pharmacology
- Toxicology



# BBSP Faculty Research Areas

**BBSP students have a wide range of research opportunities available to them. The 14 participating PhD programs together comprise over 400 faculty with a variety of research interests, many of which span multiple areas.**

Bacteriology

Behavior

Biochemistry

Bioinformatics

Biomaterials

Biophysics

Cancer Biology

Cardiovascular Biology

Cell Biology

Cell Signaling

Chemical Biology

Computational Biology

Developmental Biology

Drug Delivery

Drug Discovery

Ecology

Evolutionary Biology

Genetics

Genomics

Immunology

Mineralized Tissue

Molecular Biology

Molecular Medicine

Nanomedicine

Neurobiology

Organismal Biology

Pathogenesis & Infection

Pathology

Pharmacology

Physiology

Plant Biology

Stem Cells

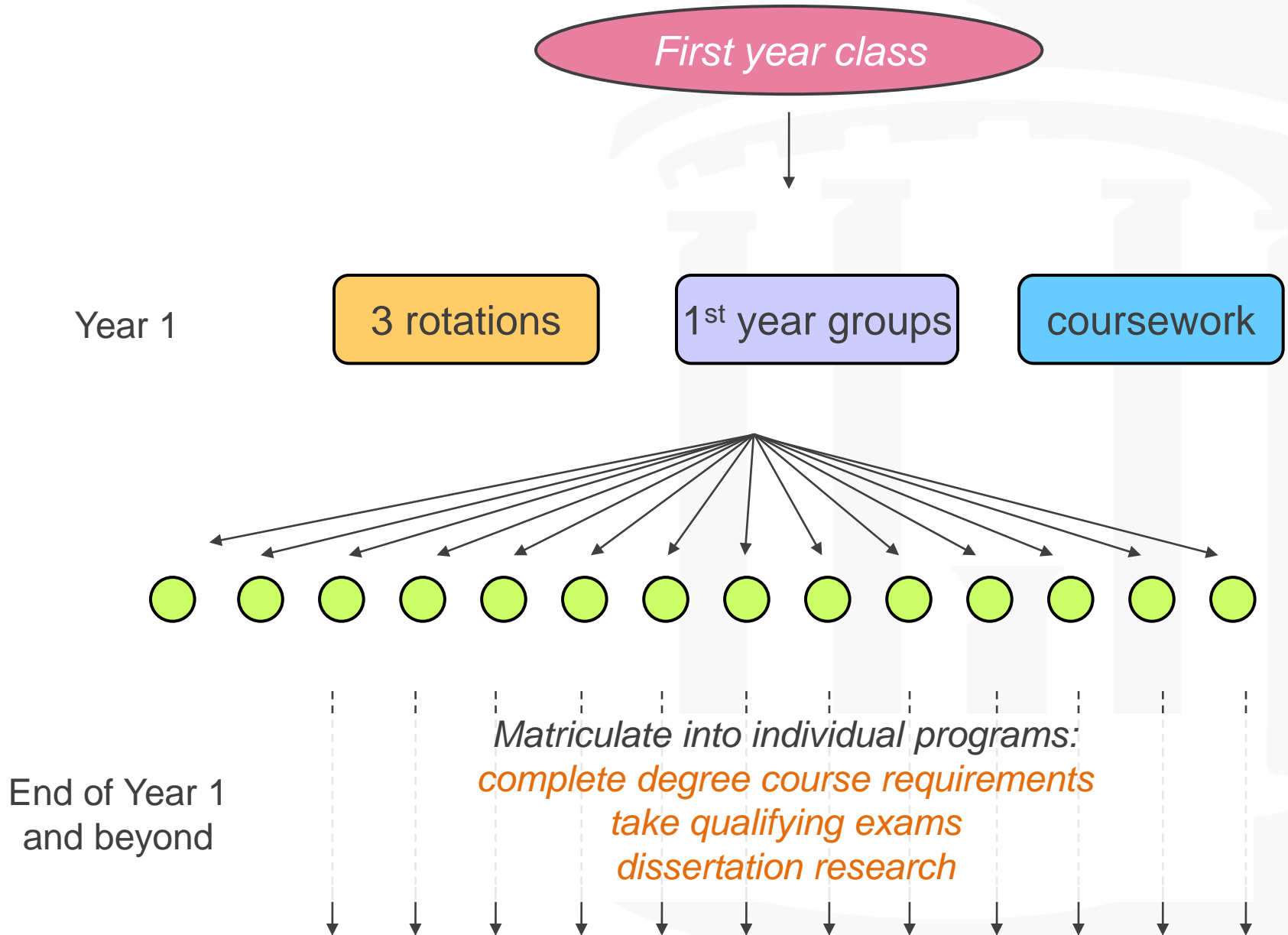
Structural Biology

Systems Biology

Toxicology

Translational Medicine

Virology





# Financial Support

- Stipend for 2013-2014 is \$27,500/yr
- Students **GUARANTEED** stipend support for 5 years if they remain in good academic standing
- Health insurance, tuition, fees paid by the program (for the enrollee only)

# Admissions Overview

- **Apply** -- Applications are submitted and binned to 1 of 4 different Admissions Committees based on the applicant's research interests and experience.
- **Review** -- Faculty review the applications and select interviewees.
- **Interview** -- Interviewees visit UNC and meet with faculty, students, and staff during 1 of 5 interview weekends held Jan-Mar.
- **Admission** -- Committees meet following each weekend to decide Admissions Offers.
- **Acceptance** -- Initial offers are made, and additional offers may follow based on applicant decisions.

# Apply Early to Increase your Chances for Admission

- BBSP 2013 Deadline
  - *Dec. 3<sup>rd</sup>*
- 4 Admissions Committees
- Application review begins **well BEFORE** the deadline
- Committees start meeting in December
- Greatest success – early reviewed applications (because the cmte hasn't seen the entire pool)
- *Applications will not be reviewed without GRE scores, transcript, and at least 2 of the 3 required letters*

# Who's on the Committee

- UNC Faculty who have active research programs and labs...
  - » Faculty in need of graduate students!  
(*Employers seeking employees!*)
- Review Process:
  - » Each Application is assigned to 2-3 faculty for review.
  - » They review all materials and score the application.
  - » Applications are ranked based on average score.
  - » Applications above the cut-off score are discussed during the cmte mtg to decide interview offers.
  - » Any application (including those below the cut-off) can be brought up for discussion.



# **SO, WHAT'S THE GOAL OF THE APPLICATION?**

**To make it to the next step in  
the admissions process...**

# What's the Goal of the Application?

## GET AN INTERVIEW!

- » Avoid being thrown into the “No Interview” group
- » Convince faculty reviewers that you know what grad school is about
- » Demonstrate that you have experience in a similar research/academic environment
- » *Persuade faculty to want to meet you and/or want to “hire” you*

**Last year: >1250 applications for ~292 interviews**

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# Graduate School is a Job



**The research advisor's lab is a business, and you are a ~\$200K investment!**

- He/She will hire the best students
- The results need to support his/her research goals
- He/She needs employees that are team players
- He/She needs employees that are self motivated
- He/She needs you to help them succeed in their own career



# A Mentor's View: The Package

*(remember these for LOR's)*

- Hard Working
- Independent
- Critical Thinker
- Team Player
- Passionate about Science
- Creative
  
- Mentors Hate to see – disinterest, cell phones, Facebook, email, web surfing!!!
- They also dislike inefficiency!!!



# 7 Habits of Highly Effective Graduate Students

- 1 Choose your lab wisely
- 2 Take ownership of your project
- 3 **Don't work in a vacuum!!!**
- 4 Read papers and ask questions
- 5 Follow your curiosity and passions
- 6 Don't let discouragement drag you down
- 7 Work hard



# A Competitive Application...

- Project-based research experience
- Strong Letters of Recommendation
- Statement of Purpose
- GPA
- GRE scores

# What is Project-Based Research?

- No lab technician
- Real hypothesis-driven project
  - » Scientific Question
  - » Hypothesis
  - » General methodology
  - » Findings
  - » What does your work mean to you, the lab, the field?
  - » Take ownership and drive the project!
- Presentations/publications

## How do you get this kind of experience?

- Summer Research programs
- Postbacc Programs
- Project-based research at your home institution

# Letters of Recommendation (LORs)

## LORs can make or break an application

- » Letter writers can defend your application in a manner you are not qualified to... so, show them your entire application. If you can't do this, then why are you applying?
- » Letters writers should want you in their lab/program
- » Letter readers should want you to rotate in their lab
  - How will you accomplish this?
  - What should the letters say?
- » Who will be your letter writers? Why?
- » How/When will you ask them?

# LORs should...

- Not be less than 1 page... that's too short
- Not be more than 2 pages... that's too long
- Focus on the applicant... not the project
- Briefly establish the letter writer's credentials
- Indicate how the applicant compares to other grad students or undergrads that the author has trained and have been successful in grad school
- Answer the question, "Would you accept this student into your lab?"
- Expound upon the applicant's likelihood for success in grad school and beyond?

# Statement of Purpose...

## *not a Personal Statement*

- **Read the Directions! Include the following...**
  - » Genuine, long-standing interest in science
  - » Why research? What is your experience in RESEARCH? “*Why should we hire you?*”
  - » Realistic expectations of graduate education
  - » Why you are interested in a PhD? What are your career plans, and why is the PhD necessary for you to get there?
  - » Why UNC? (or the school of choice)
  - » **Remember, you are a small business hire!**
- Be sure to address any “red flags” in your application – low GRE scores, low cumulative or science GPA, limited research experience, etc. Are you a risk? If you can’t identify the red flags, ask someone else.
- Remember, what is the reader (faculty reviewer) looking for?

# GRE Scores

Quantitative score is more important in the sciences than the Verbal score... but try to do well on all components of the exam!

The average percentiles of matriculating students for Fall 2013 are ~75% for both verbal and quantitative.

- How will you prepare for the GRE?
  - *What do a good GPA and low GRE scores suggest?*
  - *What about the opposite?*
- **You must prepare for the exam if you want to go to grad school! You're not a poor test-taker if you don't prepare for months... you're just lazy!**



# GPA

Cumulative and Science GPA are important.  
C's or lower in science courses are a problem...

You may not be able to do anything about your grades, but don't hide them – no “elephants in the room”!

Explain any issues...

Enroll in grad-level courses to mitigate any problems and demonstrate that they are behind you

# Remember a “Package” as we review some letters...

## A Mentor’s View: The Package

- Hard Working
- Independent
- Critical Thinker
- Team Player
- Passionate about Science
- Creative

# Student 1 - 3.6 gpa; GRE: 46th% V, 61st% Q, 45th% W

To Whom It May Concern:

[REDACTED] was a student in both my Microbiology and Advanced Biological Topics class. She was a motivated student, punctual to class, and always expressed an interest in learning. She always asked thought-provoking, intuitive questions. I was impressed by her willingness to succeed and her quest for knowledge. In both classes, [REDACTED] always scored within the top 10% of the students.

Since 2009, [REDACTED] has often come by my office to talk about future career goals and her aspirations. During these interactions it is obvious that [REDACTED] is both outgoing and optimistic. I know that she is actively involved with several university organizations in addition to playing in the marching band. This requires both a time commitment and organizational skills that will benefit [REDACTED] in all her future endeavors.

[REDACTED] has participated in two summer research programs while a student at [REDACTED]. Her first experience was at [REDACTED] and her second research experience was at [REDACTED]. After both internships, [REDACTED] returned to campus with enthusiastic stories of her lab experiences. She loved the research laboratory and has since presented her work at several national conferences.

[REDACTED]'s academic ability combined with her commitment to becoming a research scientist will make [REDACTED] a successful graduate student in any program. Please contact

## Student 2 – 3.8 gpa; GRE: 18th% V, 65th% Q, 11th% W

I am writing in support of [REDACTED] application to BBSP. Throughout the course of my education (UNC, UC Berkeley), postdoctoral training (at Duke University Medical School), and in my faculty position at [REDACTED] I have worked closely in the lab with some of the most motivated and impressive students in the country. [REDACTED] intellectual engagement, enthusiasm, and drive compare quite favorably with these elite students. [REDACTED] is spending her post-baccalaureate year in my lab as part of the [REDACTED] program to prepare students from under-represented minorities for graduate school. She began her project mid-summer, and is making excellent progress.

During my interactions with her during the interview process for our [REDACTED] program, *I was so impressed with [REDACTED] intelligence and eagerness to tackle something challenging, that I started her on an ambitious independent project.* [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] project is designed to directly test that hypothesis. She has generated a collection of independent stable cell lines expressing wild-type and mutant [REDACTED], and will subject them to a battery of assays for genome stability. Among those assays are colony formation, mutagenesis (spontaneous acquisition of drug resistance), DNA damage sensitivity, chromosome number, and chromosome structure. In the short time she has been in the lab, [REDACTED] has already generated one additional [REDACTED] mutant to add to the collection, mastered human cell culture and colony assays, and (with much persistence) successfully visualized individual chromosomes using a metaphase spread protocol. I am working with [REDACTED] directly as though she were a second-year graduate student who just joined the lab for her thesis, and I am optimistic that we will be able to produce a concise publication with her as co-first author. With any other student, I might have assigned her as a helper to a senior lab member, but in her case I felt she could handle her own project. She is highly motivated to move past the initial stages of generating the cell lines so she can get some “real data.”

**Student 2 continued – 3.8 gpa;  
GRE: 18th% V, 65th% Q, 11th% W**

██████ has many personal qualities that will help her succeed in graduate school that cannot be taught. She is extraordinarily driven and actively seeks out challenges. As part of the ██████ program, students take one graduate-level biomedical science class; ██████ chose one of the most difficult classes we teach, “Advanced Molecular Biology,” and she is performing well in that class. *She is highly intelligent and asks astute scientific questions about not only her project, but also projects of her colleagues.* She is cheerful and resilient, is not discouraged by failed experiments, and spends long hours in the lab determined to succeed. It is not at all unusual for her to stay in the lab late at night and on weekends and I have never worked with a student at her stage who was so dedicated to making her project work. It is truly a joy to be around her on a daily basis and most especially when she finally made her first plasmid construct or got the chromosome spreads “just right.”

Her only weaknesses that I have observed thus far are simply her inexperience with managing an independent project and her need to overcome occasional feelings of inferiority. By the fall of 2012 however, she will have skills at least equal to most masters-level students who join ██████ Ph.D. program, and will have had several opportunities to present her work in seminars and poster session. I am also sure that through this experience she will begin to see that she is at least as talented and capable as the colleagues that she respects so much. She is concerned that her verbal GRE scores are not competitive, and given her Ethiopian origins, it is perhaps not surprising that some of the vocabulary on that test is unfamiliar. She worked hard to improve her scores and was rewarded with a significant increase from the first to second attempts. Most importantly for graduate school I assure you that her spoken English is superb and nearly unaccented, and her writing abilities are on par with most of our first-year graduate students (i.e. good but needs more practice). I would not hesitate to have her join my lab for her thesis research. In my opinion, she would be among the most attractive thesis students in our BBSP class, and she will have opportunities to join any lab she rotates in.

In summary, ████████████████████ is a superb candidate for any graduate program in biomedical sciences. *She has much to offer her future colleagues: high intelligence, incredible determination, unmatched work ethic, and enthusiasm for science.* Please contact me if you have any questions.



## Student 3 – 3.3 gpa; GRE: 36th% V, 22nd% Q, 72nd% W

I enthusiastically recommend [REDACTED] for admission to graduate school at your institution. I served as [REDACTED] supervisor of research for the NSF Summer Research Experience for Undergraduates Program at UNC-Chapel Hill (SURE Program) last summer. My laboratory studies the function of neural cell adhesion molecules in neural development and plasticity using mouse genetic models. [REDACTED] displayed a high degree of enthusiasm, persistence and a strong work ethic in conducting an independent research project in the lab. She is committed to a career in neuroscience and wishes to enroll on a prominent graduate program to obtain a PhD degree, which will enable her to pursue her long range goals.

[REDACTED] research project focused on investigating the role of an autism risk factor [REDACTED]

[REDACTED] For this project she used immunofluorescence labeling and confocal microscopy to localize [REDACTED] in layer 4 of the visual cortex to dendritic spines, where it colocalized with a marker of thalamocortical axon terminals vesicular glutamate transporter-2 (VGluT2). In addition she compared [REDACTED] null mutant mice with wild type littermate controls for altered distribution of thalamocortical terminals within the cortical laminae. This involved a difficult method of stereotaxic labeling with microruby injected into the lateral geniculate nucleus of the dorsal thalamus and following the axon terminals to the visual cortex. She systematically analyzed data across multiple cortical bins, which involved working out a new software program in Neurolucida for our lab. Her results showed a shift in the distribution of thalamocortical axon terminals when NrCAM was deleted. This finding may help explain the abnormal visual acuity displayed by NrCAM null mutant mice, which can be relevant to autism spectrum disorders.

[REDACTED] presented an outstanding poster of her research on the final day of the SURE program at UNC, which was well received by the faculty. Both her oral and written communications at lab meetings and in progress reports were also outstanding. She was successful in working with others in the lab, as well as independently whether in conducting assays, analyzing data, or developing the next tier of experiments to investigate her scientific question. I know that if she is accepted into your graduate program she will develop into an excellent young investigator who will be committed to a career in science

# Who was offered an interview?

- S1 - 3.6; 46%, 61%, 45%
- S2 - 3.8; 18%, 65%, 11%
- S3 - 3.3; 36%, 22%, 72%

# Who was offered an interview?

- S1 - 3.6; 46%, 61%, 45% -- NO
- S2 - 3.8; 18%, 65%, 11% -- YES
- S3 - 3.3; 36%, 22%, 72% -- YES
- **WHY???**



# Think about this...

- If you were applying to grad school right now...
  - » Who would be your strongest letter writer? Are you sure? Why?
  - » What could/would they do or say in the letter to help you gain admission?
- » *If you don't know the answers to the questions above, then why are you requesting a letter from that person?*
- REMEMBER, Your application is Your best representation of You and Your qualifications... what does it say about You when You choose recommenders poorly?

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- Now, how can your summer (or other) research experience help...

# In lieu of what we've discussed so far...

- How will your research experience help you reach your goals for graduate school?
- What are you going to do to make sure that happens?



# To Establish a Relationship and Communicate with Your Research Mentor

- ① **Meet regularly** – it keeps you motivated to make progress and keeps your mentor aware of your work.
- ② **Prepare for your meetings** – bring a list of topics, plan for what you hope to get out of the meeting, send a summary of progress since the last meeting
- ③ **Follow-up** – after each meeting with a brief summary that includes time and plan for next meeting, new summary of what you think you are doing, to do list for yourself, to do list for your advisor, list of related work to read, list of major topics discussed, list of what you agreed upon
- ④ **Be professional** – don't let your personal life impact your professional life
- ⑤ **Communication is key** – set up a system that fits their style
- ⑥ **Be honest** – about your skills and knowledge
- ⑦ **Establish multiple mentors**
- ⑧ **Don't sit back** and wait for your mentor to guide you
- ⑨ **Be open to feedback**
- ⑩ **Communicate** clearly and address any issues sooner than later



# Remember The Package and Be The Package

- Hard Working
- Independent
- Critical Thinker
- Team Player
- Passionate about Science
- Creative

# Demonstrate the Package!

- Get the research experience you need
- Act like a grad student or learn how
- Talk to your PI/program director about your plans and get their support and buy-in
- Get feedback about your strengths and weaknesses and improve
- Find out what the programs will be looking for, and be that!
- **Earn the letter that you need!**



# Let's Review

- Apply Early
  - Know the process
  - Remember that you're applying for a job...
    - » The positions are in a small business
    - » Work to get an interview
    - » The job supports the life and career of several people including the research PI (Faculty)
  - ***Know what the program is looking for and be that!***
- ... and if you don't have the needed experience, get it!***

**If you don't gain admission this year, then present a stronger package next year!**



- ▶ June to May mentored research experience
- ▶ Labs skills boot camp in early summer
- ▶ GRE prep course tailored to your needs
- ▶ Take graduate level course in the fall
- ▶ Get help with grad school applications and interviews



# Good Luck and Thank you

I'm happy to answer any questions you have.

## Summer Research programs:

**Jessica Harrell, Ph.D.**

**[jessica\\_harrell@med.unc.edu](mailto:jessica_harrell@med.unc.edu)**

## Postbacc program:

**Josh Hall, Ph.D.**

**[jdhall@unc.edu](mailto:jdhall@unc.edu)**

## PhD programs:

**Ashalla Freeman, Ph.D.**

**[ashalla@unc.edu](mailto:ashalla@unc.edu)**