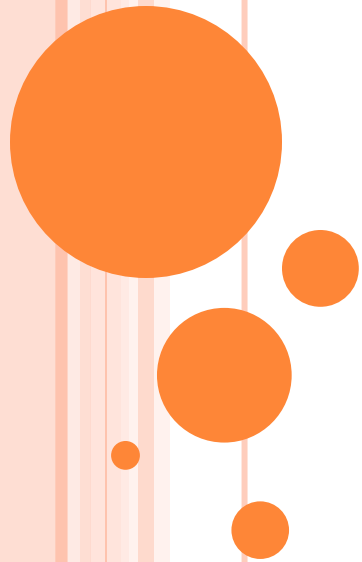


RESEARCH CAREER DEVELOPMENT

**FINDING AND CHOOSING
A DOCTORAL PROGRAM**



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Acknowledgements:

- Beyond the Beakers: SMART Advice for Entering Graduate Programs in the Sciences and Engineering. Gayle R. Slaughter, Ph.D. Baylor College of Medicine/National Science Foundation. 2005
- **Survival Skills and Ethics Program:**
 - Beth Fischer
 - Michael Zigmond
 - www.pitt.edu/~survival

- **The Leadership Alliance –**
Graduate School Guide
http://www.theleadershipalliance.org/pdf/grad_guide.pdf

Tips on Preparing for and Applying to Graduate School
<http://www.theleadershipalliance.org/pdf/tips.pdf>

- Careers in Science and Engineering: A Student Planning Guide to Grad School and Beyond (1996). Committee on Science, Engineering, and Public Policy ([COSEPUP](http://books.nap.edu/books/0309053935/html/11.html))
<http://books.nap.edu/books/0309053935/html/11.html>

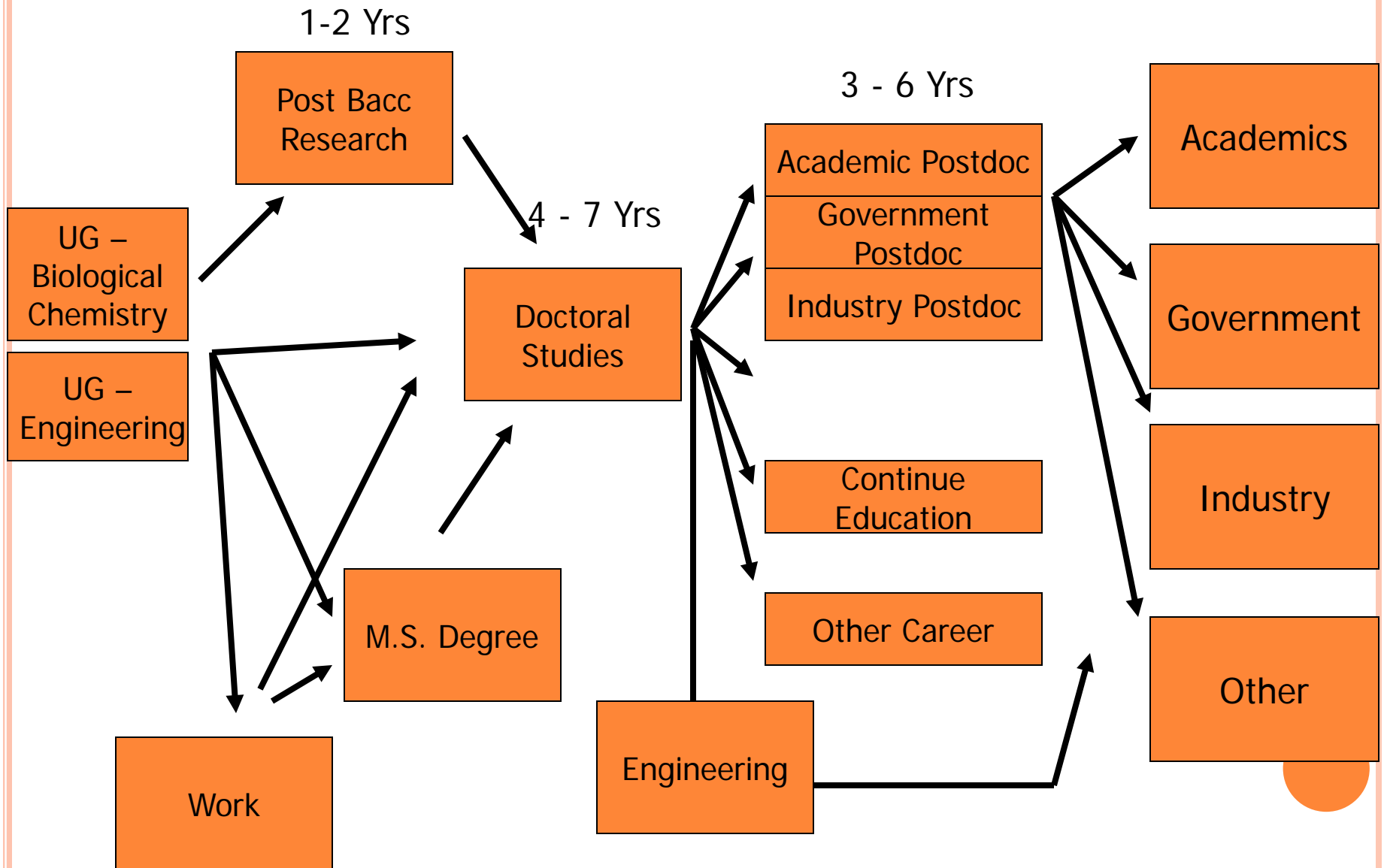


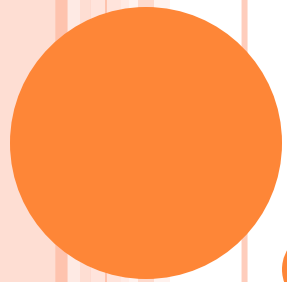
WHAT YOU SHOULD CONSIDER REGARDING DOCTORAL EDUCATION

- What is doctoral education?
- What can you study, and where?
- Is doctoral education worth the trouble to you?
- Can you get into graduate school?
- What field do you want to pursue?
- What school/program will you apply to?
- **How do you successfully apply?**



STANDARD PH.D. TRAINING PATH





WHAT CAN YOU STUDY, AND WHERE?

GRADUATE SCHOOL FIELDS/PROGRAMS

- Neurobiology/Neuroscience
- Physiology
- Microbiology/Immunology/Endocrinology
- Cell/Molec./Dev. Biology
- Biochemistry/Biological chemistry
- Biomedical Engineering
- Chemistry
 - Green
 - Organic
 - Manufacturing
- Pathology/Molecular Toxicology
- Pharmacology
- Radiological Sciences
- Biostatistics
- Electrical Engineering
- Ecology and Evolutionary Biology
- Environmental Health Sciences
- Epidemiology
- Oral Biology
- Biological and Medical Informatics
- Biophysics
- Civil Engineering
- Genetics
- Computational Biology/Bioinformatics
- Pharmacogenomics
- Forestry
- Integrative Biology
- Translational Research
- Molecular and Biochemical Nutrition
- Plant Biology
- Vision Science
- **And Many MORE!!**



WHERE DOCTORAL TRAINING TAKES PLACE

- Look for “Graduate Programs” or Graduate School
- At “Universities”
 - <http://www.utsa.edu/graduate/>
- At Academic Medical Centers/Schools
 - <http://gsbs.uthscsa.edu/main/>
- At Academic Veterinary Schools
 - <http://www.cvm.tamu.edu/resgrad/grad/index.shtml>
- In association w Graduate Schools:
 - Organizational Funding – HHMI
 - Janelia Farms Research Campus <http://www.hhmi.org/janelia/grad.html>
 - NIH Graduate Partners
 - In classes at University
 - All or part of research at NIH
 - <https://www.training.nih.gov/programs/gpp>





CAN YOU GET INTO GRADUATE SCHOOL?

(generally, Yes, if you've got the right background and strong letters!)

BUILDING YOUR CREDENTIALS-

- Look at what Graduate Schools look for, and do it...
- Ultimately:
 - Someone who will succeed and excel and, thus...
 - Will be a good financial investment
 - Will be a good time investment



SPECIFIC SCHOOL'S PRE-REQUISITES – CAN YOU GET IN?

- Entrance Requirements
 - GPA (very variable, but watch UD courses...)
 - Berkeley – Usually high...
 - GRE (variable, with variable emphasis)
 - Courses (Particularly at end of UG studies)
 - Experience
 - Research
 - Publications/presentations
 - Your personal characteristics/motivations
 - Strong letters of Rec
 - Other
- Number to be admitted
- Interviews
 - Number given
 - Funded or unfunded



MORE DEEPLY - WHAT DOCTORAL PROGRAMS WANT

- Has background required for success
 - Coursework/foundation in field
 - Can survive coursework- GPA/GRE (C's are failing in Grad School)
 - Knows what they are getting into
 - Research preparation
 - Publications
 - Presentations
- Has motivation required for success
 - Programs, summers, internship, presentations, etc.
- Has skills or potential to perform activities of science
 - Research Skills
 - Analytical Skills/Critical Thinking
 - Communication Skills
 - Potential for Creative independent thinking
 - Can balance research and coursework
 - Will assist in school's research efforts




CON'T - WHAT DOCTORAL PROGRAMS WANT

○ Maturity...

- Reliability in laboratory
- Works independently
- Takes criticism constructively
- Responsible
- Easy to work with
- Good character
- A bit immature...not really a problem... ;)

○ Fits well with their program

- Has compatible research interests with faculty
 - Has potential to eventually run own lab
 - Will impact “energy” of school
 - May make great breakthroughs for them
 - Will be a good representative for their program, forever
 - Increase the program’s diversity
- 

TRANSCRIPTS/GRADES

- Balance activities to promote GPA
- Most scientists weren't -very high- GPA people
- Shows how you did your job as a student
- Last two years most important
- Shows your motivation and consistency
- Challenging coursework better
- Minimum 3.0....better if higher
 - Show improvement over time, if lower
 - Important in upper division major courses
- Can be overcome if...
 - Great letters
 - Pubs/credentials
 - Great Statement and Interviews



GRE TEST SCORES

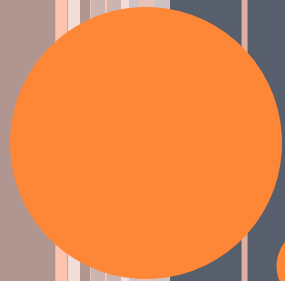
- Required by nearly all schools
 - Of varied weight
 - May also want subject test
- Will also count on some grants
- Take GRE Prep course if possible...
- Vocabulary flash cards!
 - People can't talk over your head
- Take practice tests
- If low, study and retake
- Try to get at least 1000 – Old test.
- Take spring or summer prior to applying, if possible
- Can be overcome if...
 - Great letters
 - Pubs/credentials
 - Great Statement and Interviews



IF YOUR CREDENTIALS ARE WEAK...

- GRE: Study for and retake
- Grades:
 - Possibly begin M.S. training and get “A”s
 - Postbacc with Academic Prep
- More Research/Preparation
 - Job as Research Asst or Postbacc
 - Think like a researcher
 - Get hours in
 - Get Letters of Rec
 - Get pubs
 - Confirms commitment
 - Helps to confirm interests





WHERE DO YOU WANT TO APPLY?

NOT ALL PROGRAMS ARE EQUAL...



FINDING INFO ABOUT SCHOOLS

- **Talk to professors/Your Mentor!**
- **Work in Laboratory**
- **Summer Programs/Internships**
- **Conferences**
- **Advertisements**
- **Graduate Fairs**
- **Online**
- **Visiting Professors**
- **Professional Societies**
- **Libraries**
 - Ratings Guides
- **College Career Center**
- **Recruiters**
- **Campus visits**
- **Speak to Grad Student**
- **Direct Request:**
 - Application
 - Catalogues
 - Brochures
 - Grad admissions apps
 - Financial aid apps



PROGRAM DESCRIPTIONS

- Descriptions of Schools:
- <http://www.petersons.com/graduate-schools.aspx>
- <http://www.gradschools.com>
- <http://www.cgsnet.org/>
- <http://www.graduateguide.com/>
- <http://www.phds.org/rankings/>
- <http://graduate-school.phds.org/>



PROGRAM RANKINGS

○ Rankings!

- US News Grad School Rankings

- <http://grad-schools.usnews.rankingsandreviews.com/best-graduate-schools/top-science-schools>

- PhDs.org

- <http://graduate-school.phds.org/rankings>



FACULTY QUALITY VARIES...

- One particular? (usually no!)
 - Flexibility to change directions
- Ability as educators and mentors
- Ability as scientists
 - Grants
 - RO1 <http://grants.nih.gov/grants/funding/r01.htm>
 - Publications
 - Nature, Science
 - Awards
 - Nobel Prizes
 - National Academy of Sciences Members
 - <http://www.nationalacademies.org/>
 - Know how to “Play the game” of science...
- Mentoring vs Reputation...



PROGRAM/SCHOOL QUALITIES I

- Degree Statistics
 - Time to Degree
 - Degree Completion
- Course requirements for PhD
- Qualifying exams?
- Location
 - Size, schools, culture, job for spouse, cost of living, transportation
- Size of School
 - Total size, # Doctoral students
- Campus environment
 - Academic
 - Library and computers
 - Equipment
 - Programs for retention
 - Course offerings
 - Cultural and social activities
 - Diversity of student population
- Degree requirements
 - Courses, research rotations, examinations



PROGRAM QUALITIES II

- Information for Prospective Students
- Preparation for a Broad Range of Careers
- Teaching and TA Preparation
- Professional Development
- Career Guidance & Placement Services
- Program Climate – “Sink or Swim”
- Overall Satisfaction
- Strong doctoral studies committees
- Graduate placement (last five yrs)
 - Industry, academic, government?
- Quality of mentoring

<http://www.nagps.org/>

National Association of Graduate Professional Students

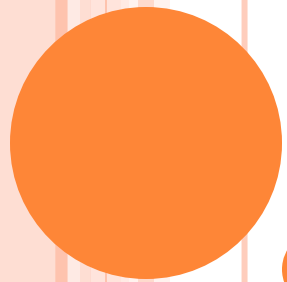


PROGRAM QUALITIES III

○ Financial Aid Considerations

- Programs should pay tuition and basic living expenses
- Med Insurance is important!
- May promise one year or more of support
- Must apply on time to obtain support
- Institutional (from university)
 - Fellowships and Traineeships – payment for study
 - Research Assistantship – Payment for work
 - Teaching assistantships – Payment for teaching
- Non-Institutional
 - Why? Prestige, higher stipend, sophistication, portable, flexibility in selecting advisor
 - NSF Pre-doctoral, Ford Foundation Doctoral for Minorities, GEM Pre-doctoral
 - <http://mbrs.utsa.edu/html/Resources.htm>





ACTUALLY APPLYING

Be Strategic

ABOUT SPECIFYING A FIELD

- Find a field to which you'd like to apply...
 - Some schools require application to particular fields/departments
 - Some allow general admission, and a student chooses which program



HOW TO CONVEY YOUR CREDENTIALS?

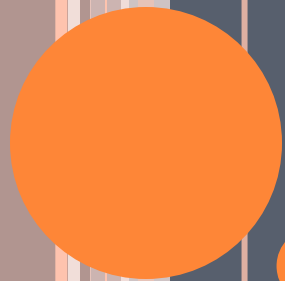
- Application Package – **Will Determine Interview!**
 - Grades/Transcript (sent by registrar)
 - GRE Scores
 - Fac Recommendations** (Very important- someone else can write your statement...).
 - Statement(s)
 - Connection with their faculty??
- Successful Interview
 - Why do you want to go?
 - Show that you understood your research!



APPLYING TO GRADUATE SCHOOL:

- Research the schools' characteristics
- Check out potential mentors/res. interests.
- Examine Online application/catalog
- Pay very close attention to deadlines!
 - Turn in early as possible
- Request Faculty Recommendations early
- Begin working on Essays (look at directions!)
- Submit everything far before deadlines





FACULTY RECOMMENDATIONS

RECS FROM FACULTY

- Required at all levels of science
- Usually a standard form plus letter
- The better they know you, the better
- Can they write very good recommendation?
- Prioritize:
 - Research mentors
 - Other researchers with whom you've worked
 - Program Director RISE/MARC
 - Course Instructors- Tenure track
- Once they've written one, the next is easy



WHAT IS IN LETTER?

- Information telling grad school how strong a candidate you are.
- CRITICAL:
 - You're thinking like a scientist – critically
 - Reliable and mature
 - You're committed to the career path
 - You're excited about science
 - You've got drive
 - Your mentor wants you eventually as a colleague
 - You'll make it in graduate school
- ALSO:
 - Can address any problems that you might have had
 - They can advocate!



LETTERS CONTINUED

- Ask early
- Provide personal statement, CV
- Provide program name
- Provide link to program
- Provide info on why you want this program
- Set appt. to talk to them
- Provide schedule of due dates
- Provide envelopes/stamps
- Gently remind as needed (they will procrastinate)



CONTACTING THEIR FACULTY

- Research their work online
- Read their pubs
- Write directly to them (Keep it brief)
 - Personalized email note
 - Interested in their research and graduate program
 - Tell about you
 - CV
 - Curriculum track that interests you
 - Research that interests you





PERSONAL STATEMENT

Keep Grad School Goals in Mind!

Make case for admitting you!

WHAT GRAD SCHOOL WANTS...

- They look for people with potential to enter and complete Ph.D., M.D., or MSTP programs
- Which part of application conveys each???
 - Has background motivators/drive
 - Can complete schoolwork
 - Has compatible research interests
 - Has compatible personality
 - Can think critically/analytically
 - Devoted to/love of research
 - Will contribute to their research effort
 - Will be able to eventually run a lab/programs
 - Will add prestige to their school
 - Will promote diversity at school
- Ultimately will be a good investment of time/money



PERSONAL STATEMENT BASICS I

- Represent you!
- Are part of your “Package”
- Questions may vary
- Can fill in info Schools want...
 - Personal motivations
 - Research experience
 - Fit at their school
 - Diversity issues



PERSONAL STATEMENT BASICS

- Can be subdivided or one large statement
 - Very commonly are asked for as a:
 - Personal statement
 - Statement of Research Experience
 - Statement of Research Interests
 - Statement of purpose
 - Personal essay
 - Statement of background and goals
 - Expression of your qualities as an applicant
- Think them out carefully
- look at program goals



POSSIBLE OUTLINE

- General Personal Statement (can be subdivided)
- Usually lasts 2 pages (then can tailor) – Single Spaced
- NOT AN AUTOBIOGRAPHY!!!
 - Personal attributes/schooling/motivations
 - Usually 1 to 2 paragraphs
 - Put motivations for Grad School (personal stuff)
 - Attributes (with anecdotes) Strengths (could use StrengthsQuest)
 - Research experiences (Majority)
 - Up to a page – at least 1 long paragraph.
 - NOT TECHNIQUES ONLY!
 - Like an abstract, but slightly less formal
 - Intro, Role in larger project
 - hypothesis/purpose, methods, results, discussion
 - Implications of findings
 - Was there a presentation, paper related to each? Awards?
 - Why their school?
 - School attributes
 - Program
 - Resources
 - Three faculty
 - Address Issues, Diversity, or hardships
 - (grade in course?)
 - Overcame stuff and has made you even more determined.
 - Aspirations/Closing
 - 1 paragraph
 - Long term goals
 - Thank you



PERSONAL STATEMENTS INDIRECTLY CONVEY...

- If mistakes are present...
 - Carelessness
 - Disorganization
 - Lack of seriousness...



HOW LONG SHOULD A STATEMENT BE?

- Follow directions of program!
- Generally, no more than two pages single spaced!
 - Someone has to read...



HOW TO START?

- Just write.
 - Use questions as a guide
 - Outline
 - Free writing
 - Focus on questions
 - Allow time for feedback and re-writing!



AT THE END...

- Tie everything together...conclusion of a 5 paragraph essay!
- Make a solid ending reaffirming your desire to attend their school



WRITING TIPS...

- Avoid typos and careless mistakes
- Avoid generalities and cliches- give specific examples
- Avoid large autobiography; focus on research and future
- Don't use gimmick- fake magazine article or play
- Don't provide unneeded details



WHAT NOT TO MENTION:

- Don't dwell too heavily on High School experiences
- If talking about an inspiring person, don't write more about them than you...
- Avoid controversial topics
 - Religion or politics mention is sometimes okay, but don't dwell
 - Things that are illegal, excessively unusual or unconventional
 - Mundane aspects of past research (buffers or descriptive methods)



REFINING...

- Make it will organized, relevant, concise
- Takes very long to write- multiple drafts, read aloud
- Grammatically correct
- Good spelling, punctuation
- Answer all questions
- Follow all length requirements
- Tailor for individual school (research mentors)
- Reviewed by mentor and others before sent in!



WORD CHOICE

- Longer, fancier words unnecessary
- Choose simpler words
- Use your own words!!!!
 - Focus on clarity of thought and expression
 - **Before:** "Although I did a plethora of activities in college, my assiduous efforts enabled me to succeed."
 - **After:** "Although I juggled many activities in college, I succeeded through persistent work."



WRITE TIGHT SENTENCES

- Beware wordy writing
- Short sentences:
 - Forceful
 - Direct
 - To the point
- **Before:** "My recognition of the fact that the project was finally over was a deeply satisfying moment that will forever linger in my memory."
- **After:** "Completing the project gave me great satisfaction."



MORE THAN ONE QUESTION?

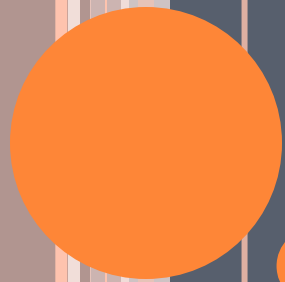
- You can subdivide this type of essay and answer individual questions.
 - Ex. Motivations separate paragraph than Research Experience...



OVERALL...STATEMENTS

- It may take you a good while to complete, but a good statement can be considered artwork. Make sure to take the time to refine, so that you represent yourself well!
- Don't get so bogged down that you don't finish it!





FINALIZING YOUR APPLICATION

DOUBLE CHECKING

- Make SURE that your transcript arrives
- Make sure that your LoRs arrive (Nag faculty nicely)
- Thank people for the letters they sent!
- Start thinking about interviews...



HAVE A GREAT INTERVIEW

- Visited their campus
- Looked good and professional
- Prepared beforehand:
 - Reread your statement
 - Answers to possible questions
 - Had questions about school
 - Knowledgeable of interviewers research
- Interviewed with faculty/Students
- Ate dinner with everyone
- Hung out with Grad Students



NOW...YOU'RE RECEIVED AN INVITATION!

- You get a congratulatory letter or email
- You get to start in Fall!!!
 - Or Earlier...
- What happens now!!???



YOU'VE RECEIVED MORE THAN ONE INVITATION!

- Review the Factors you believe important for a school
 - Strength of the department
 - Research interests of faculty
 - Amount of coursework required
 - Types of qualifying exams
 - Funding for conferences
 - Compatibility with other grad students
 - Compatibility with atmosphere
 - Whether desired courses are actually offered
 - Time to graduation
 - Selection of particular programs
 - Students with similar demographics
- Talk to prospective mentors (are they taking students?)
- Talk to graduate students (if you have not)
- Use both mind and “gutt”
- Dive in with both feet...

