American Chemical Society

# Graduate School:

## The in's and out's of getting in

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ACS Chemistry for Life™

Division of Professional Relations

YCC The Future of Chemistry

American Chemical Society

ACS Chemistry for Life™

# Graduate School:

## The in's and out's of getting in

slides will be available online:
http://www.acs.org/undergrad

Attending an ACS Meeting ⟶
Spring 2018 Meeting Highlights

Division of Professional Relations

YCC The Future of Chemistry

# The in's and out's of getting in

- How do I prepare myself for graduate school?
- How do I choose schools and programs to apply to?
- What goes into a competitive application?
- How do I know which school is the right one for me?

# What program is right for me?

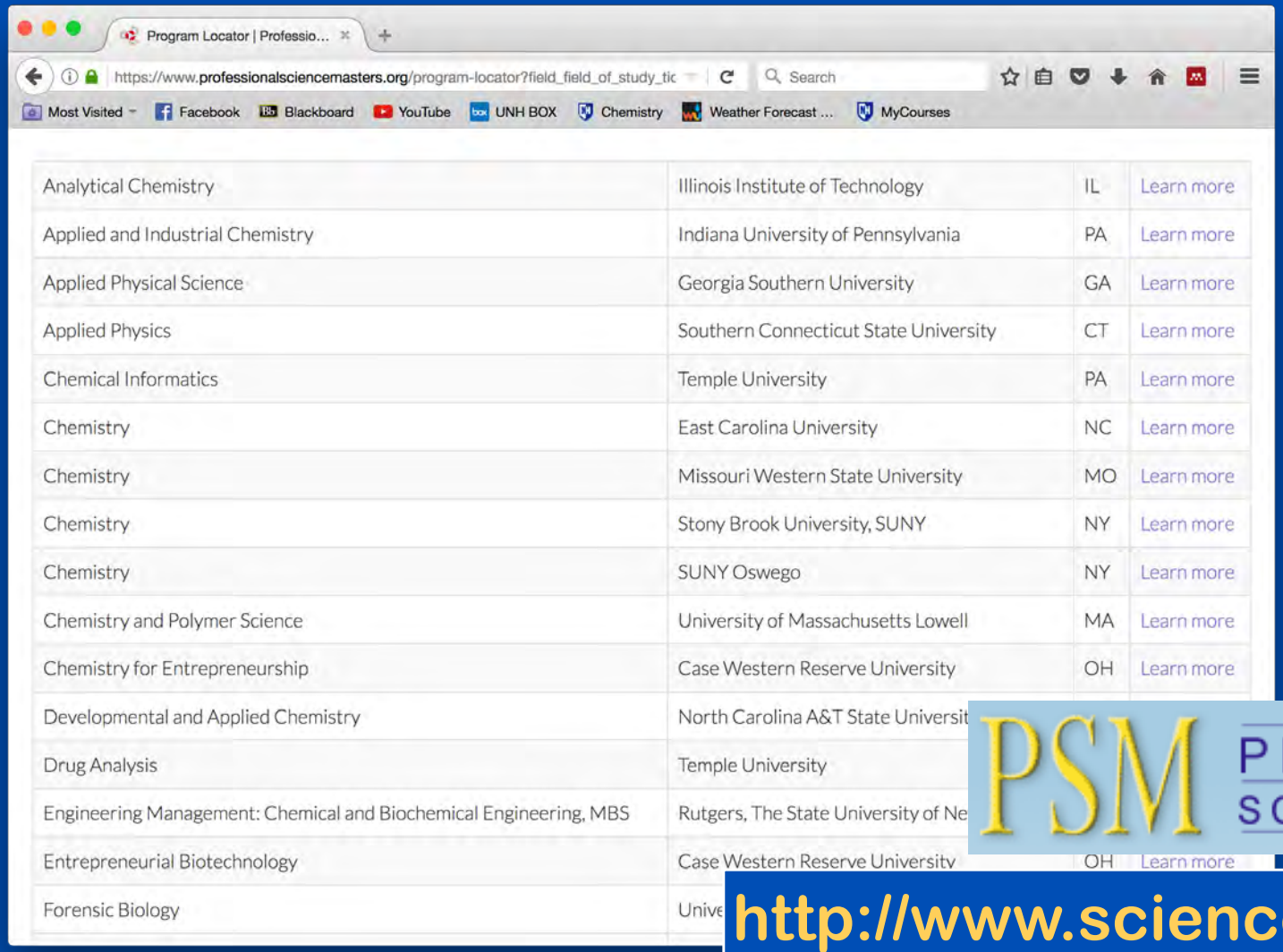
- **What do I want from my graduate experience?**
  - to diversify your knowledge and skills?
    - Professional Science Masters?
  - to increase your specific chemistry knowledge and research proficiency?
    - Masters of Science?
  - to become an independent scholar in a specific area of chemistry research?
    - Doctor of Philosophy?



# Two types of Master's Degrees

- **Professional Science Masters (P.S.M.) degree**
  - deepens chemistry knowledge
  - provides training in business, communication, policy, etc.
  - culminates in an internship or a similar experience
- **Master of Science (M.S.) degree**
  - graduate courses in all areas of chemistry and biochemistry
  - provides modest chemistry research training
  - perform research that culminates in a master's thesis

# P.S.M. program examples




| | | | |
|---|---|---|---|
| Analytical Chemistry | Illinois Institute of Technology | IL | Learn more |
| Applied and Industrial Chemistry | Indiana University of Pennsylvania | PA | Learn more |
| Applied Physical Science | Georgia Southern University | GA | Learn more |
| Applied Physics | Southern Connecticut State University | CT | Learn more |
| Chemical Informatics | Temple University | PA | Learn more |
| Chemistry | East Carolina University | NC | Learn more |
| Chemistry | Missouri Western State University | MO | Learn more |
| Chemistry | Stony Brook University, SUNY | NY | Learn more |
| Chemistry | SUNY Oswego | NY | Learn more |
| Chemistry and Polymer Science | University of Massachusetts Lowell | MA | Learn more |
| Chemistry for Entrepreneurship | Case Western Reserve University | OH | Learn more |
| Developmental and Applied Chemistry | North Carolina A&T State Universit | | |
| Drug Analysis | Temple University | | |
| Engineering Management: Chemical and Biochemical Engineering, MBS | Rutgers, The State University of Ne | | |
| Entrepreneurial Biotechnology | Case Western Reserve University | OH | Learn more |
| Forensic Biology | Unive | | |

PSM PROFESSIONAL SCIENCE MASTER'S

http://www.sciencemasters.com

# An example of P.S.M. program

- **Chemistry and Polymer Science**
  - 18 credits of chemistry/polymer science, 9 credits of management courses, 3 credits of electives, 1 credit ethics seminar, 1 credit internship
  - **required chemistry courses**: adv. analytical chem., modern organic synthesis, adv. physical chem., modern inorganic chemistry, adv. polymer science I
  - **required management courses**: project management, professional communication
  - **professional internship**: 40 hrs/week, 3-6 months in duration; “the student will work within a business, government agency or research institute directly related to their area of chemistry”

# Example of an M.S. program

- **specialize in a sub-discipline of chemistry: analytical, inorganic, organic, or physical.**
  - a suite of specialization area coursework
- **complete breadth requirement**
  - a few other courses in across chemistry sub-disciplines
- **perform research in area of specialization**
  - complete a progress report mid-way through the program
  - write and defend a thesis
- **present a seminar or similar research presentation**
- **attend departmental seminars**

# The Ph.D. degree

- **doctoral degree programs develop students into professional scientists capable of independent activity.**
  - research and dissertation are mandatory
  - other requirements vary by program: coursework, comprehensive exams, seminars, research proposals, etc.
- **yes, a fair bit of homework is required…**
  - you'll be devoting a fair chunk of your life to pursuing a Ph.D. degree; you'll want to make the most well-informed choice you can!

# Example of a Ph.D. program

- **specialize in a sub-discipline of chemistry: analytical, chemistry education research, inorganic, organic, or physical.**
  - a suite specialization area coursework; complete comprehensive examinations
- **complete breadth requirement**
  - courses distributed among other chemistry sub-disciplines
- **present a departmental seminar**
- **write and defend an original research proposal**
- **perform research in area of specialization**
  - complete a progress report mid-way through the program
  - write and defend a dissertation

# Experiences to have before graduate school

- **coursework**
  - 2 semesters general chemistry with laboratory
  - 2 semesters organic chemistry with laboratory
  - 2 semesters physical chemistry with laboratory
  - 1-2 semesters analytical chemistry with laboratory
  - 1-2 semesters inorganic chemistry with laboratory
  - 1 semester biochemistry
- **research**
  - depends on to what graduate program you aspire
  - if you do research, have something to show for it!

# Experiences to have before graduate school

- **practice with written and oral communication skills**
- **gain comfort/proficiency with software**
  - word-processing, presentation, spreadsheet
  - Origin or Igor Pro (data graphing software)
  - ChemDraw (chemical structure drawing)
  - Endnote or Mendeley (citation tools)
- **Gain skill with search engines like SciFinder, WebofScience, and PubMed**

# Applying to Schools

- **what do you want to do?**
  - *interested in research/industry?* will you gain relevant and marketable skills for a range of potential career opportunities?
  - *interested in teaching?* are there opportunities to learn about and get experience in teaching and learning?
  - *interested in business/entrepreneurship/policy?* are there appropriate professional development opportunities?
- **do the projects of current faculty or internship opportunities look interesting to you?**
- **does this look like a school at which you'll be happy?**
  - look at websites/brochures; research the location
  - small program versus large program?

DGR web | ACS Directory of Graduate Research

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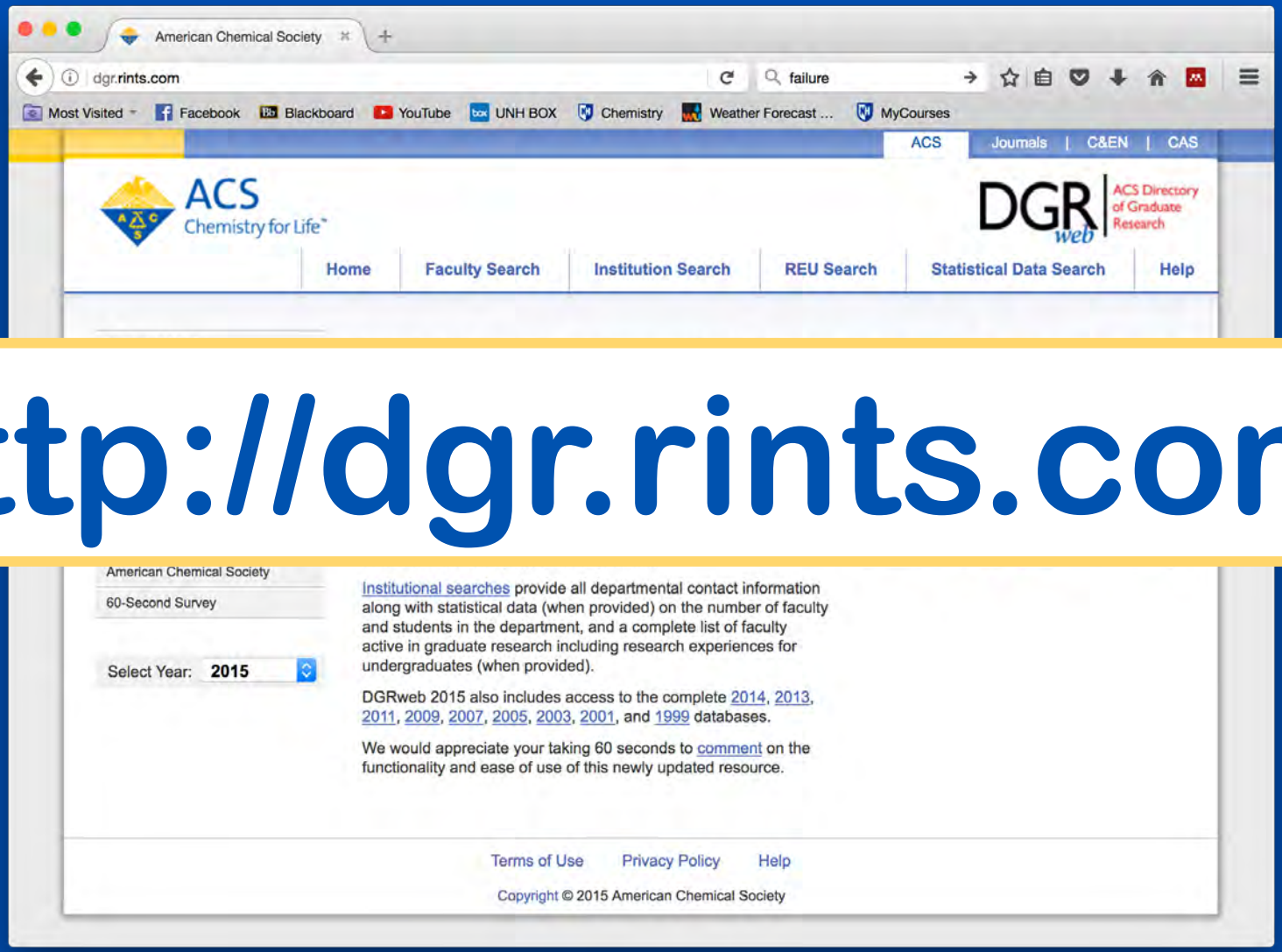



# http://dgr.rints.com/

# Pause for panel thoughts

In what other ways can students think about the distinctions between PSM, M.S. and Ph.D. degrees?

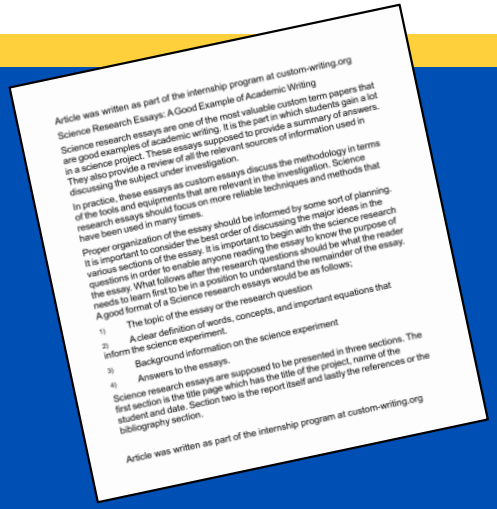
What undergraduate experiences best prepare one for graduate programs?

What are additional considerations when choosing schools to apply to?

# Applications: The Digits

- **transcript**
  - chemistry/science courses and grades
  - > 3.0 (“B”) average is a good benchmark
- **GREs**
  - take in September/October to have scores to institutions by December
  - averages: above the 60th percentile on verbal, quantitative, and analytical writing
  - GRE: Chemistry/Biochemistry may or may not be required
- **TOEFL (international students)**
  - minimum score is 80 (20 on each section)
  - TOEFL speaking: 25 (to be sure applicant can TA)

# Applications: The Statement


Article was written as part of the internship program at custom-writing.org

Science Research Essays: A Good Example of Academic Writing

Science research essays are one of the most valuable custom term papers that are good examples of academic writing. It is the part in which students gain a lot in a science project. These essays supposed to provide a summary of answers. They also provide a review of all the relevant sources of information used in discussing the subject under investigation.

In practice, these essays as custom essays discuss the methodology in terms of the tools and equipments that are relevant in the investigation. Science research essays should focus on more reliable techniques and methods that have been used in many times.

Proper organization of the essay should be informed by some sort of planning. It is important to consider the best order of discussing the major ideas in the various sections of the essay. It is important to begin with the science research questions in order to enable anyone reading the essay to know the purpose of the essay. What follows after the research questions should be what the reader needs to learn first to be in a position to understand the remainder of the essay. A good format of a Science research essays would be as follows:

1) The topic of the essay or the research question
2) A clear definition of words, concepts, and important equations that inform the science experiment.
3) Background information on the science experiment
4) Answers to the essays.

Science research essays are supposed to be presented in three sections. The first section is the title page which has the title of the project, name of the student and date. Section two is the report itself and lastly the references or the bibliography section.

Article was written as part of the internship program at custom-writing.org

- **do your homework!**
  - research application requirements and specifics on Chemistry program and graduate school websites
  - some may have specific prompts and questions that you should address
  - these may not appear when you submit the statement online
- **proof-read!**
- **don’t copy and paste a generic statement to multiple schools**

# Applications: The Statement

- **a general structure:**
  - what have you done up until now? how have your life and school experiences converged on your decision to attend graduate school?
  - what do you want to do in a future career?
  - how will coming to ***our*** school help you achieve these goals?
  - how does the work of specific faculty members play into this narrative?
- **less is not more!**
  - provide a sample of your best writing!

# Applications: The Statement

- **specifics to address:**
  - past research experiences and relevant course experiences
    - research at current and past institutions, REU experiences, industry/internship experiences
    - describe what you did and how you did it
  - leadership experience
    - *especially* teaching experience, if applicable
  - provide context to other details of your application

# Applications: The Letters

- **typically, three letters are required**
  - letters should come from scientists/faculty that have had you in class, or mentored you in some other way (e.g. research)
  - they should be able to provide information an admissions committee couldn't get from other application materials
  - international students: letters should comment on your English language proficiency
- **decide early; ask often**
  - give your letter writers *at least* one month notice
- **provide specific instructions to your letter-writers**
  - tables of deadlines, submission information, to whom to address the letters, etc; your personal statements

# Applications: Odds and Ends

- **reach out to faculty**
- **deadlines!**
  - most programs have rolling admissions; apply WELL ahead of deadlines
  - earlier applications have a better chance of getting you nominated for fellowships
  - late applications will likely not be reviewed
- **fees**
  - fees range from free to ~ $100
  - if you can't pay it, let the school know

# Pause for panel thoughts

**What do you look for in a competitive chemistry graduate program application?**

**What if you are not strong in all of then "categories" (i.e. grades, GRE scores, research, letters)?**

**What if you took time off after undergrad?**

**Are there differences between domestic and international graduate school applications?**

# The Offer

## Congratulations! I am pleased to inform you…

- **review the offer letter carefully! things to consider:**
  - the stipend
    - is support guaranteed? … for how long?
    - is it enough to live comfortably in the geographic location of the school?
  - tuition and fees
    - do you pay these out of your stipend? … or are they “waived”?
  - benefits (medical, dental, emergency, etc.)
- **if any details are unclear, pester!**

# Selecting a School

- **visit!!**
  - attend a visitation weekend or talk to the school/ department to set up an individual visit
  - get the “inside scoop” from students; *trust that the faculty are putting their best foot forward*
  - consider facilities and infrastructure
  - consider the location
    - can you live there and be happy for an extended period of time?
    - explore! are the extracurricular things you like to do available?

# Selecting a School

- **don't "put all your eggs into one basket"**
  - are there are at least 2-3 faculty with whom you're interested in working?
- **program requirements and structure**
  - rigid versus flexible requirements
  - available courses
- **is there community amongst the graduate student population?**
  - will you have a suitable peer support network?

# Independent funding is not necessary for graduate work.

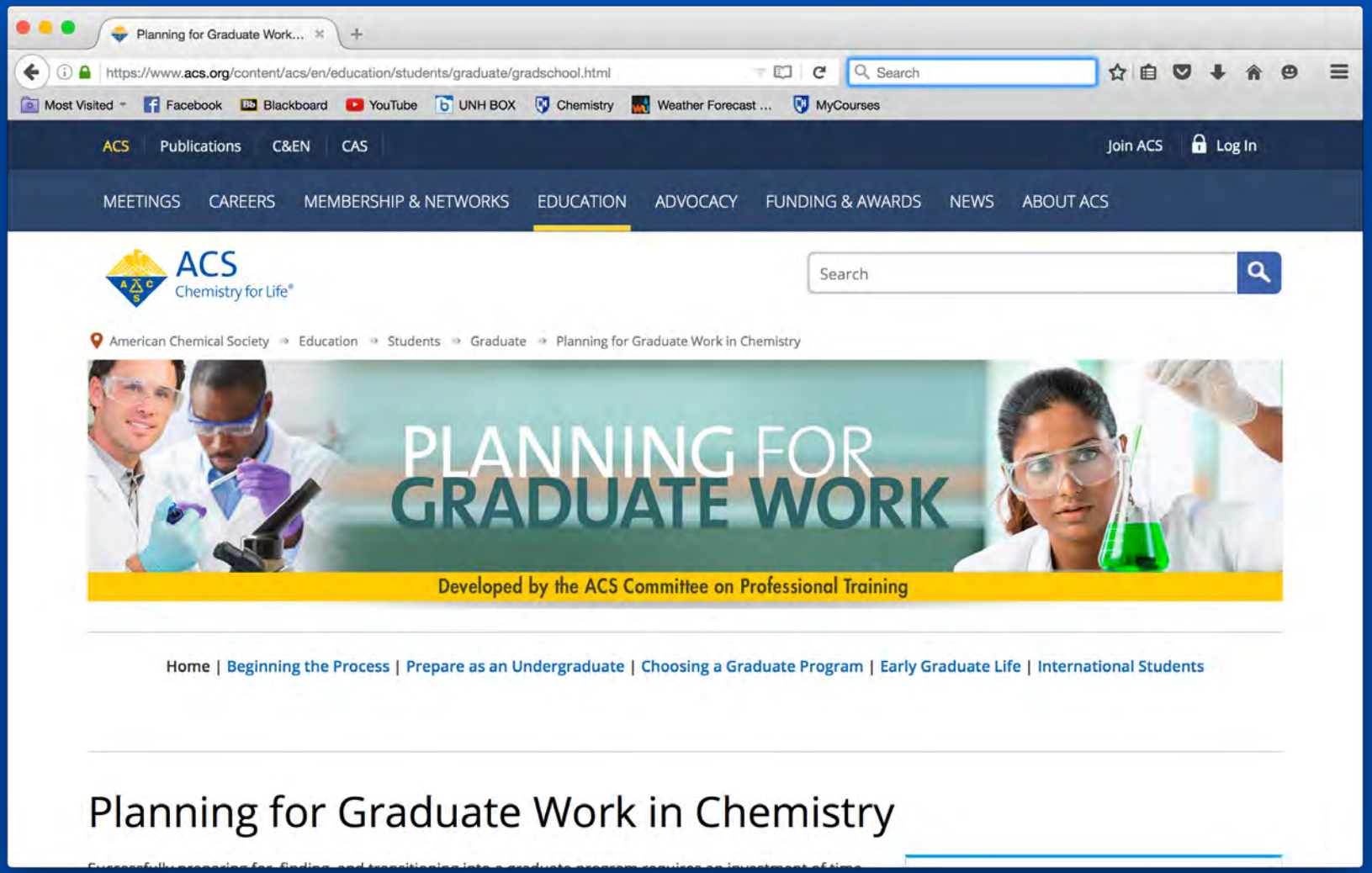
- **typical graduate programs will guarantee support for the time frame of a typical degree**
  - usually in the form of teaching assistantships
- **having independent funding can be advantageous**
  - can devote more time to research early in your graduate career
  - may allow more options for potential mentors
- **external options**
  - NSF Graduate Research Fellowship Program (GRFP), NIH Predoctoral fellowships (F32)
  - ACS Graduate Education: *Grants Fellowships and Awards*
- **internal options**
  - NIH Training Grants, various fellowships

# Pause for panel thoughts

**How did you ultimately decide what graduate program to attend?**

**Can I defer my offer of admission?**

# Planning for Graduate Work in Chemistry



COLLEGE to CAREER

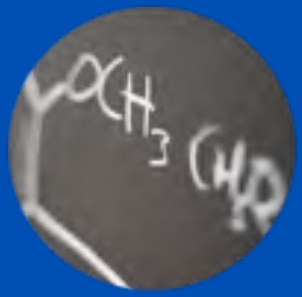
# "Next Steps" → "Further your Education"

ACS Chemistry for Life™

## Getting into a Chemistry Graduate Program

- Getting You that GREAT Letter of Recommendation
- Personal Statement Pointers
- Sell Yourself: Adding Substance to Your Personal Statement
- Ask the Graduate School Recruiter
- As the Hour Draws Near...A Timeline for Considering – and Applying to – Graduate School
- So, how about a PhD- Building Your Credentials
- Grad School Application Timeline

Find a Graduate Program



## Graduate School: Is It for You?

- Planning for Graduate Work in Chemistry
- Is Graduate School Right for Me
- Undergrad vs Graduate School: How Do They Compare
- How ACS Helps You Prepare for and Thrive in Graduate School
- Considering an M.D., D.D.S, or Pharm.D...Why Not a Ph.D.?
- So, how about a PhD?

## Graduate School Reality Check - Video Playlist


How do I prepare myself for graduate school? How do I choose schools and programs to apply to and how do I know which school is the right one for me? Join Professor Sam Pazicni from the Department of Chemistry at the University of New Hampshire, as he answers these questions and much more considering how to decide what degree is best for you, but also advice on how to survive and succeed once you have gotten in to the graduate program of your dreams!

# Time for Questions!

**If you like, compose a thoughtful question for the panel on the notecard provided.**

If you want to know what to expect when you get to graduate school, please attend the next session!

Use this QR code to access the exit survey for this session. Tell us how we can make it better!