Preparing for Graduate School

UNIVERSITY of WASHINGTON

Agenda

- Getting Started
- Statement of Purpose (guiding questions)
- Research Experience
- Letters of Recommendation
- Academics and GRE (or not)
- Tips and Tricks
- Fellowships

Getting Started

- Make a list of schools you are interested in
  - Research Versus Classwork, Rotations versus placements
- Places to live, faculty to work with, and a school you would be proud to attend
- Visit their website, gather what you can here first
- Call each schools program manager or advisor Ask what they look for in applicants
- Take your list, add the traits that each program looks for and requirements to apply

Short Answer Questions

- Using bullet points, please list the different research experiences you have had.
- Tell us about your most successful or interesting research experience in a lab environment.
- Why do you want to pursue a Ph.D. in Neuroscience?
- Why do you want to attend the UW?
- What does Diversity, Equity, and Inclusion mean to you? How could you as a graduate student contribute to our values and goals to diversity, equity, and inclusion?
- Describe a time you navigated a challenging obstacle, scientific or otherwise; how did you handle it?
- Which UW Neuroscience research labs particularly interests you and why?
- Is there anything else relevant to your application that you would like to share that was not covered in the questions above?

Statement of purpose

- Each school is looking for something different
- Most schools will specify on their website what they are looking for (if not, ask)
- Needs to be captivating while also detailing why you deserve entry into their program

Research Experience

- Every program will want different levels of experience so make sure you are making the most of your time at WWU
- Our program likes to see at least 6MO – 1 YR experience, however, our average is about 20+ full time months
- This is probably the biggest thing for Research based programs as you spend 5 years in a lab
- Make sure to have relationships with your PI's.
- Techniques versus time
- How long to stay in a lab

Letters of Recommendation

- Research based programs will want letters from your PI's.
- Ask your recommenders to be very specific about the work you completed
- If only been in 1 lab but multiple faculty have observed your work, talk to those faculty about a letter
- "Would you be willing to write me a positive letter of recommendation?"

Academics and GRE's

- Most programs will look at how you did in your classes, not just your GPA
- Our program is interdisciplinary, so we hope to see life sciences, physics, math, and neuroscience if your school offers it
- If you know you didn't do well in a particular set of classes, entertain the idea of retaking the course
- You can use the statement of purpose to discuss any hardships in your transcript
- Check about GRE's, many schools are no longer requiring them

Tips and Tricks

- What happens if I am missing requirements? Should I apply anyway?
- Retaking classes is an incredible opportunity that is rarely used, and it definitely comes up in admissions meetings in our program
- Looking to go into a specialized Neuro field like Comp Neuro? Utilize the time now to take advanced math and coding classes
- Every school has a writing center, take your statements of purpose to these centers! (Also, always check the school name is correct)
- Email Faculty early and try to build relationships before applications are due

Fellowships

- Diversity ARCS/ARCS: Most STEM programs have ARCS awards to give away (17K over 3 years)
- If you are offered any fellowship at a university you know you will not be attending TURN IT DOWN ASAP (This funding typically will then go to another student who may really want/need the funding)
- Flip side, if you got into your top school but haven't gotten a fellowship, then don’t accept right away (Funding could come before the deadline and you can miss it)

Questions?

University of Washington Graduate Program in Neuroscience

UNIVERSITY of WASHINGTON

Agenda

- What we are, and are not
- Facts about UW
- Structure of our program
- Research Areas
  - Vision
  - Addiction and Motivated Behavior
  - Ion Channels
  - Neurodegeneration and Disease
  - Computational Neuroscience
  - Behavior
  - Neurodevelopment
- Questions

What we are, and are not

- Neuroscience is an interdisciplinary program, not a department
- Neuroscience crosses campus boundaries: 4 schools; 27 departments; 5 partner institutions across the city
- 150 faculty members
- UW has an integrated, lively campus: undergrad, grad, professional
- 90+% Animal Models (similar to most Neuroscience Programs)

Some facts about UW

- Consistently among top 5 in NSF & NIH funding for public universities
- 80 Members of National Academies
- 61 Members of Institute of Medicine
- 15 MacArthur Fellows
- 5 winners of National Medal of Science
- 6 Nobel prizes
- Protein phosphorylation; transgenic mice; green fluorescent protein; Na and Ca channels; neural basis of olfaction

Structure of our Program

	Autumn	Winter	Spring
Year 1	Jump Start	Cell biology Nerve, muscle, synapse NeuroStatistics	Systems neuroscience Quantitative Methods	Cognitive neuroscience Neurobiology of disease
	Lab rotations, seminar, discussion course, Monday lunches with faculty, apply for NSF fellowship		
Summer	Experimental Design and Grant Writing Course		
Year 2	Elective?	Elective?	Elective?
	Teaching practicum		
			General exam
Every Year	Program Retreat, Posters ‘n Pints, Student Symposium, Outreach activities Dissertation research, seminar		
	Final exam (thesis defense)		
	GRADUATE!		

Research Areas

- **What are some of the research areas you might explore?**

- **What are the questions? What techniques are being used? Why does it matter?**

Vision

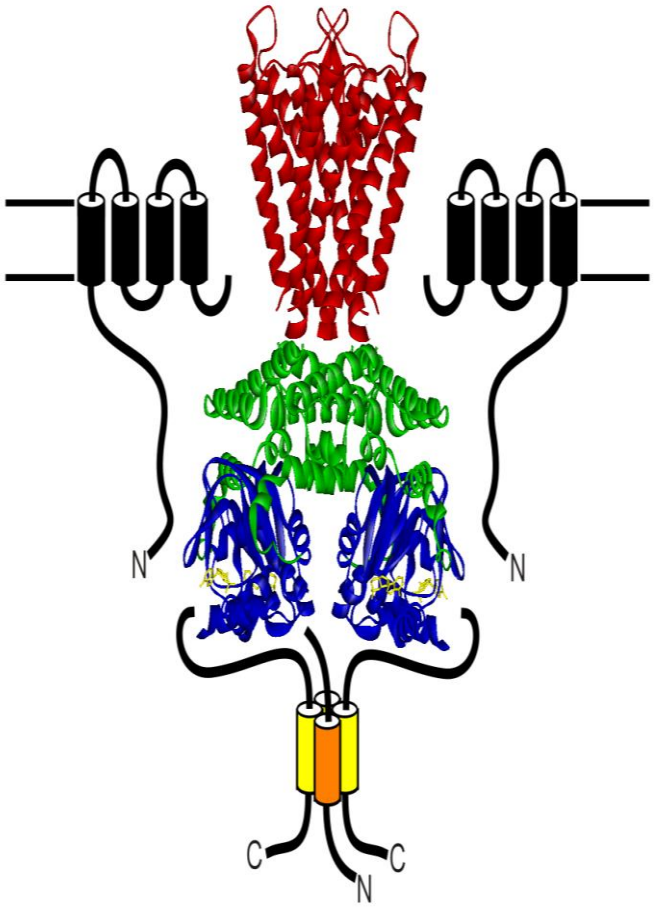
- How does the retina develop its complex structure? *Wong*
- What role do different types of retinal neurons play? *Rieke, Dacey*
- What are the molecular mechanisms? *Hurley, Rieke*
- Can some forms of blindness be cured? *Van Gelder, Fine*
- How does the brain process color? *Horwitz, Neitz*
- How does the brain process shape? *Pasupathy, Murray*
- How does the brain process motion? *Bair*
- How do we decide what to look at? *Boynton*

Addiction and Motivated Behavior

- **What changes take place in the brain when an individual becomes addicted?**
- **What parts of the brain are involved?**
- **How is behavior/decision-making altered when an individual becomes addicted?**
- **What treatments can restore normal brain function and reverse addiction?**

> ***Bruchas, Chavkin, Ferguson, Phillips, Neumaier, Stuber***

Ion Channels



- **Which channels are important for brain development?**

> ***Bosma, Barria***

- **What roles do channels play in sensory perception?**

> ***Dhaka, Gordon***

- **How do mutations in channels contribute to neurological diseases?**

> ***Catterall, de la Iglesia***

- **How does the structure of a channel affect its function?**

> ***Zagotta, Hille***

Neurodegeneration and Disease

- **Why do seizures lead to epilepsy?**

> ***Poolos***

- **Why are some infants susceptible to SIDS?**

> ***Ramirez***

- **Can stem cells reverse neurodegeneration?**

> ***Reh, Brenowitz***

- **Why is protein aggregation so toxic in diseases like Alzheimer's, Parkinson's, Huntington's and ALS?**

> ***Pallanck, Gardner, Xia, Zhang***

- **What role do glia play in neurodegeneration/disease?**

> ***Garden, Stella***

- **What causes synapse dysfunction in AD?**

> ***Bothwell, Sullivan***

(birds, flies, mice)

Computational Neuroscience

- How does the nervous system efficiently encode sensory inputs?
- How does adaptation compress neural coding?
- How do single neurons compute?
- What governs the reliability or variability of spike timing?
- What computations do simple neural circuits perform?
- How can we make more skilled and smarter robots?
- Can we abstract cellular processing algorithms into analytical equations that are easy to solve and incorporate into larger models?
- Can we improve ways of treating large datasets (e.g. fMRI)?

Bair, Boynton, Brunton, Fairhall, Horwitz, Rao, Rieke, Shea-Brown

Behavior

- How do we determine our location in space?
- How do songbirds recognize their neighbors, interact with them and change these interactions seasonally?
- What are the neural mechanisms of reward and placing value on goals?
- What controls our ability to speak and what underlies speech disorders?
- Why do we sleep?
- How do mice encode olfactory cues to find food or assess mates?

Beecher, Brenowitz, Daniel, de la Iglesia, Gire, Max, Mizumori, Perkel, Phillips

Neurodevelopment

- How does the cerebral cortex develop?
- What is the role of activity in setting up intrinsic properties and circuit wiring?
- What are the genetic mechanisms that allow correct dendritic patterning?
- How does the genetic control of body plan change with evolution?
- What mechanisms govern the formation of the inner ear?

Bermingham-McDonogh, Bosma, Moody, Parrish, Raible, Rubel, Stone, Swalla

Questions?