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Speakers

Layne Scherer
Senior Program Officer
Board on Higher Education and Workforce
National Academies of Sciences, Engineering, and Medicine

Beka Layton, PhD
Director
Professional Development Programs
University of North Carolina at Chapel Hill

Peter Espenshade, PhD
Associate Dean for Graduate Biomedical Education
Professor of Cell Biology
Johns Hopkins University School of Medicine
Education to build a broad skill set

- The majority of doctoral students will not acquire a position in academia
- Many doctoral students would like to develop a broad skill set, regardless of their career goals
- The dyadic mentor model increases pressure on PIs and limits opportunities for students
Mentorship to open doors & support growth

- A mentor network allows students to benefit from a diversity of professional backgrounds, expertise, and mentorship styles
- There are evidence-based practices for positive mentorship
- Many of these practices involve respecting and honoring student identities
Podcast available now!

The Science of Mentorship

- 10 episodes that share evidence-based practices for effective mentoring told through the personal stories.
- Episodes include physicist Dr. Jim Gates, physician Dr. Vivian Pinn, mathematician Dr. Richard Tapia, and Twitter phenom immunobiologist Dr. Akiko Iwasaki.
- https://share.transistor.fm/s/b80603b8
Wellbeing to support student persistence

- Doctoral students in some fields report mental health issues at up to 6x the rate of the general population
- Top stressors include the labor market, career decisions, funding, research progress, and hostile educational environments
- PIs can promote student wellbeing through equitable practices
Questions & requests for community engagement

Graduate STEM Education for the 21st Century and Mental Health, Substance Use, and Wellbeing in Higher Education

Contact: Layne Scherer, lscherer@nas.edu

The Science of Effective Mentorship in STEMM

Contact: Maria Lund Dahlberg, mdalhberg@nas.edu
NON-ACADEMIC CAREER PREPARATION: WHERE TO START?

REBEKAH L. LAYTON, PHD, CMC, PCC
Careers Beyond Academia

- The Process:
  - Career Exploration
  - Experiential Learning
  - Career Planning

- Where to turn?
  - Faculty
  - Trainees (Grad & Postdoc)
  - Resources & Organizations

- Finding a Career You Love
Trainees may be feeling like this…
1. Career Exploration

- Explore Job Ads
- Network & Informational interviews
- Career Workshops, Seminars, & Courses
## Sample Career Tracks

<table>
<thead>
<tr>
<th>Career</th>
<th>Employment Category</th>
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<tbody>
<tr>
<td>Research-Intensive</td>
<td>Tenure Track Research</td>
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<td></td>
<td>Industry Research</td>
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<td>Non-Tenure Track Academic Research</td>
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<td>Government Research</td>
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<td>Non-Research-Intensive</td>
<td>Teaching Intensive Careers</td>
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<td>Other</td>
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<td>Business Development</td>
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<td>Science Writing and Communication</td>
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<td>Science Policy</td>
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<td>Intellectual Property</td>
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<td></td>
<td>Regulatory Affairs</td>
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</tbody>
</table>

Example Trainee
Career Interests

[Bar chart showing percentage of respondents considering career tracks from 2012 to 2018 for various fields such as Industry research, Tenure-track academia, Government research, Translational medicine, Scientific consulting, Science outreach, Teaching Intensive..., Science policy, Science writing/editing, Science administration, Regulatory affairs, Intellectual Property.]
Example Career Interests
UCSF Survey (n=338)

% of students strongly considering the given career path

2. Experiential Learning

- Intersect JobSims
- Site visits
- Internships

InterSECT Job Simulations
Interactive Simulation Exercises for Career Transitions
3. Career Planning

- Self-Assessment/Reflection
- Information gathering
- Goal-Setting
Individual Development Plan Overview

An Individual Development Plan (IDP) is a structured planning tool designed to help you:

- identify long-term career goals that fit with your unique skills, interests, and values,
- make a plan for improving your skills,
- set goals for the coming year to improve efficiency and productivity, and
- structure productive conversations with your mentor(s) about your career plans and development.

This module will guide you through the process of creating an IDP:

1. Self-assessment
   Consider your skills, values, and interests.

2. Career exploration
   Learn about career options for PhD-level scientists, and compare your skills, interests, and values to each option.

3. Set goals
   Make a concrete plan for how you will improve your skills, build your network, and get the experience you need to prepare for your future career.

4. Implement plan
   Recruit mentors to help with various parts of your plan.
Skills, Interests & Values Assessments

To gain a better understanding of your career-related skills, interests, and values please take each of the following assessments.

The **Interests assessment** will help you evaluate what career-related activities you enjoy doing most and those you would prefer to avoid. In the **Skills assessment**, you will consider some of the many skills you may already use and determine your level of experience and ability with each. Finally, the **Values assessment** will help you reflect upon what is important to you in order to have a satisfying work environment.

Once you’ve completed these assessments you can compare the results with the Job Families that are of interest to you.
Careers of 1400+ UNC PhD Grads since 2000

2019 Census Job Function

- Research Staff or Technical Director: 349
- Postdoctoral Researcher: 246
- Industry Group Leader or Faculty PI: 245
- Administration: 137
- Business Development/Consulting: 108
- Unknown: 91
- Teaching, Faculty, or Staff: 90
- Healthcare Provider: 59
- Science Writing and Communication: 59
- Data Science/Analytics: 35
- Clinical Research Management: 31
- Technical Support and Product Development: 31
- Regulatory Affairs: 29
- Entrepreneurship: 24
- Sales and Marketing: 19
- Completing Further Education: 18
- Intellectual Property and Law: 18
- Clinical Services: 16

http://bbsp.unc.edu/prospective-students/outcomes/
Skill Importance by Career Field

Fig 2. Currently employed PhDs rated the importance of each skill for their current role ("Other" responses not included on the plot above). Overall mean importance rating for each transferrable skill during employment is represented by the corresponding grey bar. Each career track mean is represented by a color-coded dot overlaid on the grey bar corresponding to each transferrable skill.

Transferrable Skills by Career Field

**Research-Intensive**
- Creativity/innovation
- Career planning/awareness
- Ability to work with people outside the org

**No Difference**
- Discipline-specific knowledge
- Ability to analyze data
- Oral communication skills
- Ability to make decisions/solve problems
- Ability to set vision and goals
- Written communication skills
- Ability to work on a team
- Ability to manage others
- Ability to gather/interpret information

**Non-Research-Intensive**
- Time management
- Ability to learn quickly
- Ability to manage project

Transferrable Skills:
Acquired Doctoral Skills and Skill Importance Ratings in Research-Intensive and Non-Research-Intensive Careers (means)

Fig 1. Sorted in order of acquired doctoral transferrable skill (left = highest)

Resources

- Graduate Career Consortium
- NACE & O*NET
- Society resources in your discipline
  - FASEB Professional Development
Organizations-Policy & Leadership

- Council of Graduate Schools – Career Pathways
- Coalition of Next Generation Life Sciences
- NIH Broadening Experiences in Scientific Training
- Future of Research
- Rescuing Biomedical Research
- NIGMS
Organizations-GradCareer Practitioners

- Graduate Career Consortium
- National Postdoctoral Association
- AAMC Group on Graduate Research, Education and Training (GREAT)
Magic Wand

- Have an A and an A’
- Holistic Career Planning: CAP Triangle
- Venn Diagram of Skills
- If you’re not sure, try it!
- Pay it forward: people want to help
NON-ACADEMIC CAREER PREPARATION AT JHU: A CASE STUDY

Peter Espenshade, PhD
Johns Hopkins University School of Medicine
Johns Hopkins University has made a strong commitment to mentorship and professional and career development.
JHU President Ron Daniels chaired NAS panel that generated the report “The Next Generation of Biomedical and Behavioral Sciences Researchers: Breaking Through”

He determined that previous calls for action had little impact and that universities need to do their part. Requires investment in data transparency, programming, and policy development.

Paul Rothman, Dean of JHU School of Medicine, adopted a zero-tolerance policy for mistreatment of students.

Strong, engaged leadership is essential as progress requires significant investment of resources: faculty effort, administrative effort, and programming.
Leadership – Data transparency

- President Ron Daniels and Chancellor Sam Hawgood from UCSF led a group of 10 institutions to form the Coalition for Next Generation Life Science.

- Coalition members commit to publishing data on PhD and postdoctoral scholar populations and outcomes (time to degree and career choice).

Coalition for Next Generation Life Science

Data

For A Stronger Workforce

Our goal is to bring transparency to PhD and postdoctoral training in order to empower and inform training for the next generation of scientists around the world. Our members commit to collecting and publishing data using common standards on their life science training programs.
Leadership – Data transparency

- Coalition has grown from **10 to 54 institutions** since its launch 3 years ago, including 3 non-US universities.
- Local data are a valuable tool in discussions with faculty.
Mentorship – Engaging Faculty

- Faculty need to see it as their responsibility to help trainees identify a career path and prepare for it.
- Faculty often say, “How can I help? I only know about academic careers.” Important to have resources to point students and postdocs to.

- New T32 requirements spurred change

- Programming – JHU School of Medicine
  - Mentorship training required for all faculty who are eligible to train PhD students
  - Annual competency survey for faculty mentors identifies problem relationships

- Policy
  - University requirement for Individual Development Plans, annual career plan check-in
  - University JHU Mentorship Commitments of Faculty Advisors and PhD Students, sets expectations for both sides of relationship
  - University-level PhD Program Review, enables review of program practices
  - SOM Conflict Resolution Procedures, formalizes process and provides a path for removal of program faculty if warranted. “Privilege not a right to train students.”
Professional Development and Career Office. 5 FTE support 3 divisions (SOM, SPH and SON).

Sample programming: career exploration (Myers-Briggs Type Indicator and Clifton Strengths assessments) and professional skills (presentations and resume prep)

Combination of internal and external funding allowed office to expand over time.

- OPTIONS program for biomedical PhD students, NIGMS grant
- Internship program, initial support from Provost’s Office for launch and then host companies support costs.
Integrating options into 5 PhD programs at SOM and School Public Health:

- 2016: Cellular and Molecular Medicine (CMM)
- 2018: Biochemistry, Cellular, and Molecular Biology (BCMB) and Pharmacology (Pharm)
- 2019: Molecular Microbiology and Immunology (MMI)
- 2020: Biochemistry and Molecular Biology (BMB)

Currently required for 215 PhD students, removes barriers to attendance.

Programming is open to all Hopkins PhD students and postdocs.
OPTIONS- PhD Career Curriculum

- **Year 1** – Attend 3 hours of career awareness programming

- **Year 2** – Attend 3 hours of career awareness programming

- **Year 3** – Attend 12 hours of career exploration programming (six 2-hour sessions) and conduct an informational interview

- **Year 4** – Meet with OPTIONS program director to develop strategic career plan and engage in training relevant to career choice
OPTIONS- Phase 1: Career Awareness

Attend 4 or more Investigating Career and Networking (iCAN) Panels

2020-2021 Panel Topics
- Science Communication and Policy
- Faculty Roles Outside Academia
- Academic & Government Administration
- Biotech & Pharma - R&D Roles
- Biotech & Pharma - Non-Bench Positions
- Business, Finance & Consulting
- Science Education & Outreach
- Discover the Possibilities (Misc.)
OPTIONS - Phase 2: Career Exploration

Join 1 or more OPTIONS Career Communities

- Academic Research
- Biotech & Pharma
- Science Policy & Communication
- Business Side of Science
- Academic Teaching
Maximize your Hopkins experience by meeting with a career coach to create your own customized Career Plan.
Resources – Health & Wellness

- **Office of Wellness and Health Promotion**, mission is to enrich student experience, help students thrive professionally and personally, and promote an environment that supports student health and well-being.

- **Johns Hopkins Student Assistance Program**, provides support in dealing with the pressures and challenges students face during their academic and professional careers.

- **University Health Services**, on-campus, medical and mental health services for Hopkins students, residents, fellows and trainees and their spouses/domestic partners.
How Can You Do This?

- Approach depends on the size and structure of your institution

- Engage leadership
  - If you have T32-funded programs, not implementing is a risk.
  - PhD students and postdocs are essential to research mission.
  - Advocate for your institution to join CNGLS.
  - Engage stakeholders: PhD program directors, students, postdocs
  - Recognize that resources are always limited, so aim for steady progress.

- In the meantime, scientific societies are excellent resources for career information – ASBMB, ASCB, FASEB
Questions for the Speakers
To Ask A Question

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Other Questions?

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