Misconceptions

All PhDs want to work as faculty members.

The only jobs out there for PhDs are faculty jobs.

There are no faculty jobs.

PhDs have no employable skills.

PhDs are not using their research skills in non-faculty jobs.

PhDs outside the tenure-track are not happy in their work.
Assertions

Most PhDs are unsure of what jobs exist for them.

PhDs have many employable skills.

PhDs are using their research skills in most jobs.

PhDs in science are happy in their work.
Research questions

In what sectors are recent science PhD graduates currently employed?

What skills, if any, are developed organically during graduate and postdoctoral training?

Are these same skills required for success in different occupations?

What are the primary activities in which PhDs are engaged at work?

Are PhDs in science satisfied in their work?
Survey methodology

Sample
PhDs who graduated between 2004 and 2014
Doctorate in physical, life, computational, engineering, or social science
Must have worked, studied, or trained in the U.S.

Recruitment
Used LinkedIn, email, articles in Science Careers and NatureJobs
Survey open from April 9 to May 11 2015

Instrument
Designed in Qualtrics
Demographics, Education, Postdoctoral Training, Employment
Demographics

8,099 usable responses

42% men, 56% women

82% U.S. citizen or permanent resident, 17% international

10% underrepresented minorities

70% married, 26% single, 2% divorced/separated

36% have children
Postdoctoral training

68% have held one postdoctoral appointment

27% have engaged in 2 distinct postdocs

4% have engaged in 3 or more

N=4727
But what about YOU?

What are you interested in?

What skills have you developed?

What are your personal values?
Interests.

How do you like to spend your free time?

Which books or journals do you read?

What shows do you watch?

Which blogs do you follow?

What do you feel EXCITED about?
Skills.

Discipline-specific knowledge
Ability to gather and interpret information
   Ability to analyze data
Ability to manage a project
Oral communication skills
Written communication skills
Ability to work on a team
Ability to make decisions and solve problems
   Ability to manage others
Creativity/innovative thinking
Time management
Ability to set a vision and goals
Career planning and awareness skills
   Ability to learn quickly
Ability to work with people outside the organization
<table>
<thead>
<tr>
<th>% acquired skill during training</th>
<th>Skill</th>
<th>% “important for success on the job”</th>
</tr>
</thead>
<tbody>
<tr>
<td>95%</td>
<td>Discipline-specific knowledge</td>
<td>80%</td>
</tr>
<tr>
<td>95%</td>
<td>Ability to gather and interpret information</td>
<td>92%</td>
</tr>
<tr>
<td>93%</td>
<td>Ability to analyze data</td>
<td>83%</td>
</tr>
<tr>
<td>83%</td>
<td>Ability to make decisions and solve problems</td>
<td>93%</td>
</tr>
<tr>
<td>82%</td>
<td>Oral communication skills</td>
<td>93%</td>
</tr>
<tr>
<td>82%</td>
<td>Written communication skills</td>
<td>91%</td>
</tr>
<tr>
<td>71%</td>
<td>Ability to learn quickly</td>
<td>89%</td>
</tr>
<tr>
<td>67%</td>
<td>Creativity/innovative thinking</td>
<td>82%</td>
</tr>
<tr>
<td>66%</td>
<td>Ability to manage a project</td>
<td>87%</td>
</tr>
</tbody>
</table>
Values.

What do you care most about in a job?

Help others
Financial reward
Recognition
Fun
Balance
Flexibility
Leadership
Prestige
Security
Intellectual challenge
Autonomy
Location
Variety
Values.

Why did you accept the job you did?

Intellectual challenge: 718
Flexibility: 707
Geographic location: 534
Salary/benefits: 350
Job security: 210
Leadership opportunity: 189
Autonomy: 80
Variety: 58
Prestige: 57

N=2903
What about the world of work?

What **jobs** are even out there?

Is a **PhD** required for the job you want?

How might you **find** a job of interest?
Faculty employment

22% in tenure-track faculty positions
13% in non-tenure-track faculty positions

Most recent NSF data: 14% tenure-track faculty
AAUP data: 68% contingent faculty
Employment of PhDs across sectors

- Education: 49%
- Government: 12%
- Biotech/Pharma: 12%
- Non-Profit: 6%
- Consulting: 4%
- Engineering: 3%
- Research Services: 3%
- Chemicals: 2%
- Hospitals: 2%
- Software Development: 2%
- Data Science: 2%
- Energy: 2%
- Other: 1%
Education sector

- 66% Research University
- 23% Liberal Arts College
- 5% Community College
- 4% K-12
- 1% Comprehensive/Regional University
- 1% Medical School

- Academic Advisor
- Director, Core Facility
- Planetarium Director
- Grants Administrator
- Data Analyst
- Laboratory Manager
- Technology Transfer Specialist
- Associate Dean
- Research Scientist
- Curriculum Developer
- Imaging Specialist
- Public Affairs Officer
- Department Chair
- Scientific Content Manager
- Collections Manager
Education sector

- Degree: Ph.D., Biomedical Engineering, University of Virginia
- Job: Director of Professional Development, University of Virginia
- Pathway: Mentored and trained undergraduate students and developed experience for her CV
Government sector

- Field Application Specialist
- Astrophysicist
- Patent Examiner
- Grants Administrator
- Chemist
- Watershed Ecologist
- Staff Scientist
- Biologist
- Consultant
- Policy Analyst
- Program Officer
- Director, Core Facility
- Science Writer
- Public Outreach Specialist
- Data Analyst
- Communications Director
- Quality Control Specialist
- Neuroscientist
Government sector

- Degrees:
  - Ph.D., Immunology, Stanford University School of Medicine
  - MPH, Johns Hopkins Bloomberg School of Public Health

- Job: Program Analyst, National Institute of General Medical Sciences, NIH

- Pathway: Went through AAAS Science & Technology Policy Fellows Program
Biotech/Pharma sector

- Biotechnology: 50%
- Pharmaceuticals: 39%
- Medical Devices and Diagnostics: 11%

Roles:
- Vice President, R&D
- Regulatory Affairs Specialist
- Product Development Scientist
- Medical Writer
- Data Scientist
- Marketing Specialist
- Computational Biologist
- Medical Science Liaison
- Team Leader
- Technical Support Specialist
- Software Engineer
- Portfolio Manager
- Business Development Analyst
- Patent Attorney
- Principal Investigator
Paulina Hill, PhD

Biotech/Pharma sector

• Degree: Ph.D., Molecular Medicine, Tissue Engineering Massachusetts Institute of Technology

• Job: Principal, Polaris Partners

• Pathway: Technology transfer internship, served on MIT Intellectual Property Committee, founding President of MIT Postdoctoral Association, Startup Leadership Program
Non-profit sector

• Degree: Ph.D., Chemistry, University of Toronto

• Job: Director, Climate and Urban Systems Partnership (CUSP), The Franklin Institute

• Pathway: Took courses on exhibit development, volunteered at the Museum of Science in Boston, coordinated science festival activities
Pathways PhDs sought to gain experience

- Experience/networking: 54%
- Self-taught: 50%
- Collaborations: 39%
- Coursework: 37%
- Professional program: 24%
- Postdoc in field: 23%
- Volunteered: 21%
- Interned: 18%
- Other: 6%

N=3816
My favorite job titles

Volcanologist
Video Game Designer
Coordinator of Freshwater Turtle and Tortoise Conservation
Zoo Nutritionist
Aerospace Physiologist
Nanofossil Biostratigrapher
Principle Behavioral Psychologist
Community Nutrition Education Program Specialist
Director, Biofuel Strategy
Virtual Lab Manager
Foreign Affairs Officer
Director of Institutional Effectiveness
Coastal Landscape Adaption Coordinator
Health Informatics Innovations Analyst
Primary activities at work

40% engaged in full-time work conduct basic research

36% engaged in teaching

34% conduct applied research
PhD: Required/preferred for non-faculty jobs?

80% indicated that a PhD was required/preferred for their current position

PhD training is sought by employers of all kinds!
How much are PhDs making?

<table>
<thead>
<tr>
<th>Salary Range</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>$30,000 - $50,000</td>
<td>420</td>
</tr>
<tr>
<td>$50,000 - $60,000</td>
<td>646</td>
</tr>
<tr>
<td>$60,000 - $70,000</td>
<td>608</td>
</tr>
<tr>
<td>$70,000 - $80,000</td>
<td>622</td>
</tr>
<tr>
<td>$80,000 - $90,000</td>
<td>423</td>
</tr>
<tr>
<td>$90,000 - $100,000</td>
<td>315</td>
</tr>
<tr>
<td>$100,000 - $110,000</td>
<td>244</td>
</tr>
<tr>
<td>$110,000 - $120,000</td>
<td>110</td>
</tr>
<tr>
<td>$120,000 - $130,000</td>
<td>82</td>
</tr>
<tr>
<td>$130,000 - $140,000</td>
<td>36</td>
</tr>
<tr>
<td>$140,000 - $150,000</td>
<td>17</td>
</tr>
<tr>
<td>$150,000 - $170,000</td>
<td>19</td>
</tr>
<tr>
<td>$170,000 - $190,000</td>
<td>7</td>
</tr>
</tbody>
</table>

Average salary? $80,163

N=3549
How long is it taking PhDs to find jobs?

Average length of time? 6.5 months

N=3742
Finding jobs that are right for YOU

Visit a career counselor/postdoc advisor at MIT

Network, network, network…and then network some more

Check out professional associations

Conduct informational interviews

Volunteer, collaborate, intern, take classes

Give yourself enough time
## Employment satisfaction

<table>
<thead>
<tr>
<th></th>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither dissatisfied nor satisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tenure-track</strong></td>
<td>2%</td>
<td>6%</td>
<td>8%</td>
<td>47%</td>
<td>38%</td>
</tr>
<tr>
<td><strong>Tenured</strong></td>
<td>3%</td>
<td>7%</td>
<td>7%</td>
<td>46%</td>
<td>38%</td>
</tr>
<tr>
<td><strong>Non-tenure-track</strong></td>
<td>4%</td>
<td>12%</td>
<td>14%</td>
<td>45%</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Not employed in a faculty position</strong></td>
<td>2%</td>
<td>6%</td>
<td>10%</td>
<td>40%</td>
<td>41%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3%</td>
<td>7%</td>
<td>10%</td>
<td>42%</td>
<td>38%</td>
</tr>
</tbody>
</table>

N=3335
Next Gen PhD
A GUIDE TO Career Paths in Science
Melanie V. Sinche
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