BREAKDOWN (APPROXIMATE) OF BGS ALUMS ACCORDING TO PROFESSION

(2002–2011 Grads)

PhD Training

Postdoctoral Training

Scientific research-intensive Professions 65%

Other (allied) Professions 35%
# CAREER PATHS FOR THOSE WITH A PHD IN THE BIOMEDICAL SCIENCES

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WHAT PHD TRAINING PROVIDES IN RELATION TO CAREER SUCCESS

PhD Training

Skills

Traits

– absolute requirements in any form of research-intensive scientific endeavor

– highly sought in a variety of other enterprises.
SKILLS IMPLIED BY ATTAINING A PHD IN BIOMEDICAL SCIENCES

**Critical Thinking**
- Acquiring and processing of information
- Gauging evidence and arguments
- Recognizing assumptions
- Recognizing logical relationships
- Drawing warranted conclusions

**Competence in Mathematical and Computational Practices**
- Mathematical reasoning
- Statistical inference
- Systems-level modeling

**Proficiency in Experimental Design**
- Articulating a scientific premise
- Developing a hypothesis
- Testing hypotheses/Protocol design
- Reagent validation/Troubleshooting
- Data management

**Management**
- Time management
- Project management
- Mentorship
- Leading and motivating others
- Networking
- Conflict management
- Work ethic; work/life balance

**Communication**
- Clarity, precision, and intent
- Effective listening and feedback
- Manuscripts
- Grant applications
- Posters/multimedia
- Speaking to a scientific audience
- Speaking to a lay audience
**TRAITS IMPLIED BY ATTAINING A PHD IN BIOMEDICAL SCIENCE**

- Persistence; resilience
- Curiosity; a desire for answers, and for the hunt
- Creativity; imagination
- Capacity to balance receptivity and skepticism
- Focus
- Self-motivation
- Competitiveness
- High-level work-ethic

*Adapted from Emotional Competency*
ALL THE PIECES, IN THE RIGHT MIX

• Skills
  • Traits
• Interests
• Values
OUR STRONGEST ADVICE FOR YOUR NEXT 5.5 YEARS

Focus on cultivating the competencies, i.e. the skills and traits, required to do great SCIENCE!
ELEMENTS OF CAREER PREPARATION AND EXPLORATION

- **Focus on developing and/or cultivating research-specific skills and traits.**
- Individual development plans (IDPs).
- Mechanisms of exploration:
  - Career Services
  - Center for Teaching and Learning
  - Penn Center for Innovation
  - Student Groups
  - BGS Certificate programs
  - Course offerings beyond BGS
  - Graduate group and training grant-specific career workshops
  - Mentors
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INDIVIDUAL DEVELOPMENT PLAN

- **Goals of an IDP:**
  - To help design, monitor, and measure progress in training.
  - To identify both short- and long-term objectives and professional development activities needed to reach them.
  - To ensure students and mentors are communicating openly with regard to training and objectives.

- **IDPs are (currently) staged according to pre-thesis and thesis levels.**

- **IDPs are required.**
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EXPLORATION OPTIONS

- **Career Services** programming: career workshops, Biomed Career Fair, etc.
- **Center for Teaching and Learning**: CTL Teaching Certificate
- **Penn Center for Innovation**: PCI Fellows Program
- **Student groups**:
  - EE Just Biomedical Society
  - Biomedical Graduate Student Association
  - Penn Biotech Group Healthcare Consulting
  - Penn Science Policy Group
  - Penn Science Diplomacy
  - Penn Graduate Women in Science & Engineering
**EXPLORATION OPTIONS, CONT’D**

- **BGS Certificate programs:**
  - Graduate Training in Medical Sciences
  - Public Health Certification Program
  - Environmental Health Sciences Program
  - Certificate in Translational research

- **Non-BGS course offerings**

- **Graduate group- and training grant-specific career workshops**

- **Interactions with mentors:** graduate group chair, thesis advisor, thesis committee
ELEMENTS OF CAREER PREPARATION AND EXPLORATION

• Focus on developing and/or cultivating research-specific skills and traits.
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• Mechanisms of exploration:
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  • *Center for Teaching and Learning*
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  • Student Groups
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CAREER SERVICES

• Programming: career workshops, Biomed Career Fair, etc.

• Job search support:
  • Biomedical job list serve
  • Workshops in CV and résumé preparation and interviewing
  • One-on-one career advising
  • Network of alumni who are willing to talk with current students about opportunities
Our greatest hope is that you leverage your PhD training to have the greatest possible impact on society — whatever the career path — cognizant of the skills and traits that make this achievable.