The Future of Graduate Education: Rethinking Our Goals

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Objectives

- Stimulate thinking and discussion about pressing issues for the future of graduate education in the pharmaceutical sciences that are not the normal considerations

- Identify opportunities and possible methods to address these issues
Overview

- **Challenges**—In the United States, we are at a stage where some are questioning whether a Ph.D. is worth the time, energy and expense needed to offer or obtain it
  - Resources are limited
  - Academic positions are declining overall/requirements for tenure/success are increasing
  - Industry and government opportunities are shrinking
  - The ground rules are changing

- **Opportunities**—What can we do to meet these challenges?
Is PhD training worthwhile?

Why do some say NO?
Doctoral degrees

The disposable academic

Why doing a PhD is often a waste of time

Dec 16th 2010 | from PRINT EDITION
● “One thing PhD students have in common is **dissatisfaction** …’work as slave labor’”

● “A PhD may offer **no financial benefit** over a master’s degree. It can even reduce earnings.”

● “The **interests of universities and tenured academics** are **misaligned with those of PhD students** …bring in grants and beef up supervisors publication records”

● “…few (students) will be willing to accept that the system they are entering could be designed for the benefit of others, that **even hard work and brilliance may well not be enough** to succeed, and that they would be better off doing something else”
Why would anyone with a U.S. PharmD pursue a PhD given the financial opportunity cost and time associated with such an endeavor?

Tested hypothesis that there are long term financial incentives associated with obtaining a post-PharmD PhD.
Figure 1. Net present value (NPV) for PhD-related careers as compared to career in chain community pharmacy. Abbreviations: PHPR = Pharmacy Practice; Admin = Administration; MCMP = Medicinal Chemistry/Molecular Pharmacology; IPPH = Industrial Pharmacy/Pharmaceutics; CRO = Contract Research Organization.
“All salaries resulting from PhD career paths eventually surpassed that of the community pharmacist”

“Despite this positive trend in later years of employment, the cumulative NPV never caught up to the value of the practicing pharmacist by age 65 years”

(AJPE 2011:75 (1) Article 15)

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**Table 1. Cumulative Net Present Value (NPV) for PhD-Related Careers as Compared to Career in Community Pharmacy**

<table>
<thead>
<tr>
<th>PhD Area of Study</th>
<th>Career Track</th>
<th>Net Present Value (NPV) 3% discount rate ($) Age-Income Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacy Practice</td>
<td>Academia</td>
<td>-389,219</td>
</tr>
<tr>
<td>MCMC</td>
<td>Industry/CRO</td>
<td>-212,271</td>
</tr>
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<td>Academic Administration</td>
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<td>Academic Administration</td>
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</tbody>
</table>

*Abbreviations: MCMC = Medicinal Chemistry/Molecular Pharmacology; IPPH = Industrial Pharmacy/Pharmaceutics; CRO = Contract Research Organization*
Hagemeier and Muraski conclude that we “…need to consider financial incentives when developing recruitment methods for PharmD graduates to pharmacy graduate programs” — earlier interventions best

- Increased graduate stipends
- Decrease time to PhD degree
- Increase early career salaries

Also — need to recruit students who thrive on being challenged, who want to make a contribution to society through developing their ideas.
Resource Crunch

- NIH RO1 and other research funding is declining
  - RO1 pay line at 8% or less at many institutes
  - Less support for students (RAships; F31, etc)
  - NIH Training Grants more difficult to obtain
  - Bridge funding requests to academic units exploding

- State budget crunches

- University budgets declining/stretched
Academic Job Opportunities

- Overall--Tenure track positions declining
  - Economic pressures on academic institutions
  - Questions regarding the value of tenure (expansion of non-tenure track positions in teaching and research)
  - For profit educational institutions

- Schools and Colleges of Pharmacy
  - Expansion driven increase in faculty opportunities
    - Teaching positions
    - Research positions?

- Graying of academia – Holds promise for future employment, but what kinds of positions will there be?
Industry and Government Job Opportunities

● Industry Jobs
  ■ **Big Pharma cutting back** in house drug discovery research
    – Lot’s of PhDs out of work
    – Opportunities for academic researchers in drug development and CROs
  ■ **Expanding regulatory efforts**

● Government jobs
  ■ Cutbacks due to budget deficits
Changing Ground Rules for Academic Success

- **Grant Funding**
  - Change in emphasis from basic research focus to team based translational research
    - Requires major rethinking of PhD training in Pharmaceutical Sciences

- **Tenure-track at major research universities**
  - Promotion requirements increasing (grants, publications, transformative research)

- **Teaching positions**
  - Graduate students typically receive minimal training for teaching career
Opportunities

- Changes at NIH and healthcare reform offer tremendous opportunities for graduate research programs and PhD and PharmD/PhD graduates
  - Clinical and Translational Science Awards (CTSAAs) and Institutes (CTSIs)
  - National Center for Advancing Translational Sciences (NCATS) - Translational emphasis for NIH (and NSF) grants on drug discovery, development and translation
- Increased industry and governmental emphasis regulatory aspects of drug development
What can we do?

- Revise graduate training programs to prepare translational scientists who can compete in today’s world
  - Emphasis on collaborative, team based translational education and research approaches
    - Flexible “core” course work to allow students to incorporate new areas into their research
    - Discipline-specific “silo” based programs are dinosaurs
  - Take advantage of the NIH Roadmap and CTSAs
    - Maximize training opportunities for students with respect to translation research, reorganization at NIH (F31s, etc)
- Rethink unit organization and hires (e.g., joint/cluster) to develop teams to address major health issues
What can we do?

- Focus graduate student recruitment on quality versus quantity
  - Do we need to shrink the size and/or number of PhD training programs?
- Focus recruitment on students who thrive on being challenged, who want to make a contribution to society through developing their ideas
- Honest discussions with applicants regarding career objectives and directions
  - Research and/or teaching?
  - Academic, Industry or Government?
  - Independent researcher?
What can we do?

- Make Ph.D. training worthwhile
  - Expand training opportunities for Ph.D. and Pharm.D/Ph.D students to make them more competitive in the work place
    - Combined certificates/degrees (e.g., from USC -- M.S. Regulatory Sciences and M.S. Management of Drug Development)
  - Add opportunities for training in pedagogy
    - Should we develop research based Ph.D. programs that offer a focus on teaching?
What can we do?

- Make PharmD/Ph.D. training more efficient and rewarding
  - Reduce time to degree (e.g., double dipping/recognizing PharmD units for core course work)
  - Increase stipends to match Fellowships and Residencies based on licensed Pharm.D.
  - Enhance teaching experience/training for PharmD/PhD students
  - Apply for NIH postdoctoral funding
  - Competitive faculty salaries for PharmD/PhD hires
Resources

The disposable academic. Why doing a PhD is often a waste of time. The Economist, 12/16/2010

Hagemeier, NE and Murawski, MM, Economic analysis of earning a PhD degree after completion of a PharmD degree, AJPE 75 (1) Article 15, 2011


Special thank you to Jordan Cohen for his valuable insights on the future.
Thank you

Questions and ideas