MD-PhD: Is it Right for Me?

Communications Committee of the MD-PhD Section of the Group of Research, Education, and Training (GREAT) AAMC
Biomedical Scientists: Multiple Pathways

- MD graduates pursue research training during fellowship years

- PhD graduates conduct research with clinical translational training

- MD-PhD graduates combine careers of the MD and PhD
  ▪ Mentored, integrated research and medical training
  ▪ Conduct mechanism-based research
MD-PhD’s are *chimeras* who blend the discovery of new knowledge with clinical medicine at the intersection of science and medicine.
How is MD-PhD training done?

- There are over 100 MD-PhD programs affiliated with medical schools
- 44 programs are partially supported by training grants from NIGMS known as Medical Scientist Training Programs or MSTPs

- Most MD-PhD programs offer financial support: stipends and tuition waivers

- Curricula mix MD and PhD training to complete both degrees in ~ 8 years
**MD-PhD curriculum is a continuum**

**Years 1-2**
- Mostly Med School
- Some Grad School

**Years 3-6**
- Some Med School
- Mostly Grad School

**Years 7-8**
- Mostly Med School
- Some Grad School

Integrating medicine and science

**Preclinical (years 1 - 2) Complete Step 1 exam**
- Medical sciences & explore research opportunities (lab rotations)

**Research (years 3 - 6) Complete PhD degree**
- Conduct dissertation research with opportunities for clinical experiences

**Clinical (5 - 7 or 6 - 8) Complete MD degree**
- Clinical clerkships
- Additional research experiences

**PhD is awarded in a wide variety of disciplines**
PhD Disciplines

Biomedical Sciences, include:
- Biochemistry & Macromolecular Biophysics
- Cell & Developmental Biology
- Immunology
- Molecular Biology & Genetics
- Microbiology & Infectious Disease
- Neuroscience
- Pathology & Mechanisms of Disease
- Pharmacology
- Physiology

Others choices, include:
- Bioengineering & Biomedical Imaging
- Chemical and Physical Sciences
- Computational Biology & Bioinformatics
- Public Health, Epidemiology & Preventative Medicine
- Social and Behavioral Sciences
- Bioethics

Not every program offers every PhD, so ask to be sure
Program Opportunities

- Student Council
- MD-PHD specific courses and workshops
- Visiting scholar seminars
- Retreats
- National conferences and organizations
- Mentoring for Graduate and Residency Training

A community, not just a “program”
Post-Training Pathways

• ~95% of graduates pursue residencies/fellowship training:
  – 3 to 7+ years of training, varies with specialty
  – fellowship offers opportunity to return to research

• ~75% of graduates become medical school faculty

• ~65% of graduates continue to do significant (> 50%) research

• ~40% of NIH grants to MDs are received by MD-PhD

• Many graduates fill academic leadership roles

• Alternate pathways include working in industry and at research institutions (NIH, HHMI, etc.).
MD-PhD program graduates: long term outcomes

- Academia, 68%
- Industry, 8%
- Research Institute, 5%
- Private Practice, 16%
- Other, 3%

Careers of Biomedical Scientists

José E. Cavazos, MD, PhD, Neurologist, studies plasticity of the brain to better treat seizures and epilepsy

Juanita Merchant, MD, PhD, Internal Medicine, studies transcriptional control of gastrointestinal peptides that regulate cell growth and cancer

Dianna Milewicz, M.D., Ph.D., Internal Medicine, studies cardiovascular medicine and genetic diseases of the vascular system
Applying to MD-PhD Programs
Whom do MD-PhD Programs seek?

- Applicants with integrity and maturity who show:
  - Creativity
  - Leadership potential and the ability to work with others
  - Aptitude to address big questions in biomedical research
- Research experiences
- Academic record including MCAT scores
- Personal statement – why MD-PhD?
- Letter of recommendation from research mentors
- Experience in caring for others
- Extracurricular activities and life experiences
What constitutes a substantive research experience?

• Sufficient research experience to understand what you are getting into:
  • Multiple summer projects
  • Senior thesis research
  • One or more years pursuing research activities after undergraduate degree

• Familiar with the idea of testing a hypothesis
MD-PhD Statistics -2012*

• Nationally, there are ~ 5,000 MD-PhD trainees

• In the 2012 entering MD-PhD class
  ▪ 37% were women
  ▪ 16% were students of diversity

• ~1/3 of MD-PhD applicants entered an MD-PhD Program

*AAMC Table 33/34: MD-PhD Matriculant Tables*
## MD-PhD Applicant Statistics (2013)*

<table>
<thead>
<tr>
<th></th>
<th>Total Applicant Pool</th>
<th>Matriculants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Applicant Pool</strong></td>
<td>(n= 1,937) 100%</td>
<td>(n= 609) 31%</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MCAT</strong></td>
<td>31.1</td>
<td>34.5</td>
</tr>
<tr>
<td><strong>GPA</strong></td>
<td>3.6</td>
<td>3.8</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>6 - 44</td>
<td>23 - 44</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>2.0 - 4.0</td>
<td>2.8 - 4.0</td>
</tr>
</tbody>
</table>

*AAMC Table 35: MCAT/GPA for MD-PhD Applicants/Matriculants*
MD-PhD Applicant Statistics - MCAT

- **Applicants**
  - 3 - 26: 320
  - 27 - 29: 250
  - 30 - 32: 400
  - 33 - 35: 500
  - 36 - 38: 350
  - 39 - 45: 200

- **Matriculants**
  - 3 - 26: 32
  - 27 - 29: 25
  - 30 - 32: 40
  - 33 - 35: 27
  - 36 - 38: 30
  - 39 - 45: 15

- 9% of Applicants and 27% of Matriculants fall into the 33 - 35 MCAT score range.

- Students in the 30 - 32 MCAT range make up 9% of Applicants and 27% of Matriculants.
MD-PhD Applicant Statistics-GPA

Applicants

Matriculants

Students

GPA

<table>
<thead>
<tr>
<th>GPA Range</th>
<th>Applicants</th>
<th>Matriculants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.6 - 3.0</td>
<td>100</td>
<td>5%</td>
</tr>
<tr>
<td>3.0 - 3.2</td>
<td>50</td>
<td>2%</td>
</tr>
<tr>
<td>3.2 - 3.4</td>
<td>150</td>
<td>7%</td>
</tr>
<tr>
<td>3.4 - 3.5</td>
<td>200</td>
<td>10%</td>
</tr>
<tr>
<td>3.5 - 3.6</td>
<td>250</td>
<td>21%</td>
</tr>
<tr>
<td>3.6 - 3.7</td>
<td>300</td>
<td>30%</td>
</tr>
<tr>
<td>3.7 - 3.8</td>
<td>350</td>
<td>40%</td>
</tr>
<tr>
<td>3.8 - 3.9</td>
<td>400</td>
<td>50%</td>
</tr>
<tr>
<td>3.9 - 4.0</td>
<td>450</td>
<td>60%</td>
</tr>
</tbody>
</table>
Application Timeline

Application to AMCAS - Summer before entry year
- Secondary applications
- Letters of recommendation

Interviews - October to February

Final decisions - November to March

Revisit programs – March and April

Process complete – April 30

Start program - June to August
What should you look for in an MD-PhD program?

• Research environment
  - program activities, faculty, students and research opportunities

• Academic environment
  - science and clinical curricula, program integration

• Alumni achievement and community involvement

• Location

• A sense of belonging or “good fit”
For more information:

https://www.aamc.org/mdphd