2022

MD-PhD: Is it Right for me?

Communications Committee of the MD-PhD Section of the Group on Research, Education, and Training (GREAT) AAMC

• Application Process
• Training
• Careers
What distinguishes physician scientists from physicians?

**Physician**

To **use** the state of the art to help individual patients

**Physician-scientist**

To **advance** the state of the art through research

**Medical school** prepares people as life-long learners to diagnose and treat patients

**Graduate school** trains people to perform rigorous, hypothesis-driven research

Physician-scientists serve to bridge between scientific research and clinical patient care
MD-PhD graduates sit at the intersection of science and medicine

The physician scientist pipeline is so important that the government and institutions are invested in your education – paying for your tuition and benefits.
Physician-Scientists: A Spectrum from Clinician to Scientist

Adapted from McKinney, Acad Med, 2017
How do we train physician-scientists?

Almost 50% of all NIH Research Project Grants with an MD as principal investigators are MD-PhD’s, but they are only 3% of medical school graduates.
Where is MD-PhD training done?

• There are ~100 MD-PhD programs affiliated with medical schools:
  • 50 programs (with ~40-190 trainees) are supported by NIGMS training grants known as Medical Scientist Training Programs (MSTPs)
  • Most MD-PhD programs offer financial support: stipends, tuition waivers and health insurance
MD-PhD Program Overview

Goal: Prepare trainees for a career that combines research and clinical care, emphasizing research

- Curriculum integrates MD and PhD training
  - complete both in 7 or 8 years
- Many PhD fields are possible
  - Non-traditional PhD training opportunities
MD-PhD Alumni.....

• Choose a variety of **residency training** specialties

• Do **research** more than 50% of the time

• **Enjoy their careers**; more than 80% would choose their career again
MD-PhD Careers: long term outcomes

Brass and Akabas, 2019, JCI Insight 4(19):e133009
The National MD-PhD Program Outcomes Study
A Career as a Physician Scientist

Juanita Merchant, MD, PhD
Professor of Medicine
Chief, Division of Gastroenterology

...studies transcriptional control of gastrointestinal peptides that regulate cell growth and cancer
Preparing for and Applying to MD-PhD Programs
Elements of a successful MD-PhD application

- Holistic review
- Physician scientist career commitment
- Strong academics
- Experience in caring for others
- Productive research
- Integrity and maturity
- Activities and life experiences
- Physician scientist career commitment

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What constitutes a substantive research experience?

Sustained experience
Familiarity with testing a hypothesis
Experience presenting research
(publications not required)

Types of settings
• Undergraduate research, OR
• Post-baccalaureate research
To take a gap year or not?

<table>
<thead>
<tr>
<th>Gap year recommended – to fill a gap</th>
<th>Gap year not recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>I’m not sure I want to do full-time research for my career</td>
<td>I’ve done a lot of research as an undergraduate and am ready to apply</td>
</tr>
<tr>
<td>I have not yet engaged in a substantive research experience</td>
<td>I have a good understanding and ability to communicate the research I have completed</td>
</tr>
<tr>
<td>I have been involved in technical aspects without thinking about problems broadly</td>
<td>An advisor recommended it but does not frequently advise MD/PhD applicants</td>
</tr>
<tr>
<td>I need more time before committing to an ~8 year program (and other personal reasons).</td>
<td>I think I need to get publications</td>
</tr>
</tbody>
</table>

If I decide to take a gap year, what should I do?

**RESEARCH**

- Full-time as an employed position or part of a program
- Master’s or post-baccalaureate program with research and coursework (if needed to boost academics)
MD-PhD Statistics (2020-21)

- 5,913 MD-PhD trainees nationally

2020-2021 Application cycle (matriculated Summer/Fall 2021):

- 2,091 MD-PhD applicants (>62K straight MD)
- 15.7 applications submitted/applicant (avg)
- 750 matriculants: ~1/3 of MD-PhD applicants entered an MD-PhD Program in 2021
  - 50% women
  - 12.5% racial/ethnic URM
  - 9.5% multi racial/ethnicity

*AAMC Table B-7/B-8/B-9/B-12: MD-PhD Matriculant Tables*
**MD-PhD Applicant Statistics (Class entering 2021)**

<table>
<thead>
<tr>
<th>Total applicant pool (n = 2,091)</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCAT</td>
<td>510.5</td>
<td>477 – 528</td>
</tr>
<tr>
<td>GPA</td>
<td>3.65</td>
<td>1.9 – 4.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Matriculants (n = 750), 36%</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCAT</td>
<td>516</td>
<td>499 – 528</td>
</tr>
<tr>
<td>GPA</td>
<td>3.79</td>
<td>2.76 – 4.0</td>
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</table>
Self-identification of MD-PhD matriculants: goal to increase the physician scientist workforce diversity

- White: 45%
- Asian: 26%
- Hispanic, Latino, or of Spanish Origin: 4%
- Black or African American: 8%
- Native Hawaiian or Other Pacific Islander: 0%
- American Indian or Alaska Native: 0%
- Unknown: 5%
- Other: 2%
- Multiple Races/ethnicities: 10%

*AAMC Table B-7/B-8/B-9/B-12: MD-PhD Matriculant Tables*
Application Timeline
Candidates Matriculating in the Summer of 2023

Pre-application (2-3 years)
- Courses
- Research
- Clinical exposures
- Activities and life experiences

Preparation Timeline:
- Winter-Spring 2022
- Summer 2022: Apply
- Fall 2022: Interview
- Winter 2022/23: Acceptance
- Summer 2023: Start

~1.5 year process
What should you look for in a MD-PhD program?

- Environment (research and academic)
- Students, program activities & professional development, community involvement
- Support during transitions through phases of training
- Alumni achievement
- Location
- A sense of inclusion
## Myths: Successful MD-PhD applicants:

<table>
<thead>
<tr>
<th>Myth</th>
<th>Fact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>...need higher scores than MD applicants</strong></td>
<td>Review of MD/PhD applicants is holistic, the most important part of the application is physician-scientist potential.</td>
</tr>
<tr>
<td><strong>...must take at least one gap year after college</strong></td>
<td>A gap year is not necessary - it can help inform a career path or enrich a research experience for someone who did not have enough time during college.</td>
</tr>
<tr>
<td><strong>...must have publications</strong></td>
<td>Publications are not necessary; applicants should demonstrate independence; dissemination of work can be with posters, talks, and publications.</td>
</tr>
<tr>
<td><strong>...have always known about this career path</strong></td>
<td>Successful MD/PhD applicants arrive via diverse and meaningful pathways; those who have not had exposure previously should seek out opportunities.</td>
</tr>
<tr>
<td><strong>...start independent research careers later than MD graduates</strong></td>
<td>MD/PhDs and MDs receive their first NIH R01 award at the same average age.</td>
</tr>
<tr>
<td><strong>...wait to start a family until completing training</strong></td>
<td>MD/PhD students find ways to incorporate life throughout, and many start families during training.</td>
</tr>
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For more information:

- [https://www.aamc.org/mdphd](https://www.aamc.org/mdphd)
- [NIH.gov/training](https://www.nih.gov/training)
- Role models
- Knowledgeable people who care about you:
  - Directors and Mentors (Summer Program and Post-Bac)
  - Professors, Lab Heads and Department Chairs
  - MD-PhD Students, Graduate Students and Post-Docs
  - Career Advising Offices
  - PhD and MD-PhD Program Directors