Duke MD/PhD Information Session

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Overview

• Before: What do MD/PhD programs offer, and how do I get in?

• During: What will I do in an MD/PhD program, and how do I get through it?

• After: What can I do with the dual degree?
Before: What do MD/PhD programs offer, and how do I get in?
What is the purpose of MD/PhD programs?

- To train future physician-scientists
- To teach trainees to bridge clinical medicine and biomedical research
- To ensure that the scientific workforce is maintained with highly qualified trainees
- To limit the financial obligation of trainees so they stay in research
Why consider an MD/PhD?

• You love science

• You want to be a doctor and like the idea of taking care of patients

• You love doing research

• You’re excited about research to understand the mechanisms of disease
Research and Clinical Medicine are both puzzles
Research Questions

- Missing Data
- Experiments
- New Insights
Clinical Questions

Missing Data

History, Physical Lab tests

Residual questions
Reasons not to consider MD/PhD

• It’s prestigious
• It will look good on my CV
• It’s the hardest thing to do, and I’ve always chosen the hardest curriculum
• I’m not sure which path is right for me, so I’ll do both and figure it out later
MD-PhD programs

- 138 accredited US medical schools
- 82 offer dual MD/PhD degree (59%)
- 45 funded by NIH “training grants” (T32) – Medical Scientist Training Programs (MSTP)
- Remainder (37) are non-MST programs
- Duke’s program is the 4th oldest MSTP in the country – started in 1966
MSTP vs. non-MSTP

• MSTPs are typically the top programs
• MSTPs provide full funding throughout training for both degrees:
  – Tuition
  – Fees
  – Stipend (Duke: $28,000/year)
  – Value: $70,000/year, >$500,000 total
• Most non-MSTPs provide similar funding (varies by program)
• All will provide full funding/stipend during PhD years
How many MD-PhD students are there?

- ~600 matriculants each year into MD-PhD programs (vs. 17,000 MD matriculants); 3.5% are MD/PhD

- About 5,000 total MD/PhD students nationally

- Duke ~10 per yr; 68 total as of fall 2012; goal is 80-90 at steady-state
Demonstrating MD/PhD program success

- Short-term: students complete the program
- Long-term: trainees do research life-long
- High cost of training – need to ensure students complete training
What are programs looking for?

• Longitudinal research experience and a demonstrated commitment to a research career
• Clear understanding of how (and why) research will be combined with clinical training
• Great grades
• Great MCATs
• Perseverance
• Intellectual curiosity
• Enthusiasm for and dedication to scientific investigation
• Publications?
• Diversity
Differences from MD-only programs

- Less emphasis on volunteering
- Shadowing is necessary to inform the dual degree
- Both items are secondary to the research experience
- MD admission committees have varying degrees of say in MD/PhD admissions
Interview questions

• Tell me about your research

• How will you combine both degrees?
How selective are MSTPs?

• National: 1,813 applicants, 633 matriculants in 2011 (35% success)

• Duke: 400 applicants for 10-12 slots (3%)

• National: GPA=3.8, MCAT=36
  • Duke: GPA=3.9, MCAT=36.8

• Of interviewees at Duke, ~50% are accepted
During: What will I do in an MD/PhD program, and how do I get through it?
MD curriculum

• Typical MD curriculum:
  – MS1: normal physiology, anatomy, histology
  – MS2: pathology, pathophysiology
  – MS3: core clinical clerkships (medicine, surgery, pediatrics, OB/Gyn, psychiatry, neurology, family medicine)
  – MS4: clinical electives, sub-internship, interviews for residency

• Duke MD curriculum:
  – **MS1: normal body; body and disease**
  – **MS2: core clinical clerkships**
  – MS3: research
  – MS4: clinical electives, sub-internship, interviews for residency
MD/PhD Curriculum

• Most programs are 2-4-2:
  – 2 years of didactic basic science education, mostly in the classroom
  – 4-5 year PhD
  – Clinical medical education: 3rd year: core clinical rotations; 4th year: clinical electives

• Duke curriculum is unique, 2-5-1:
  – First 2 basic science years are combined into 1
  – 2nd year: core clinical rotations
  – 4-5 year PhD
  – 4th year: clinical electives
The PhD training

• Learn to “think like a scientist” – ask good questions, design experiments to answer them
• Complete a scholarly body of work
• Build a foundation for your future career
• Time to degree: 4-5 years (ideal)
• Ensure that the PhD is not short-changed despite time pressures
• Completed in any department that offers the PhD
  – Most in basic biomedical sciences
  – Increasing interest in social sciences (health policy or economics, sociology) and humanities (philosophy, ethics)
MD/PhD programs seek to integrate scientific and clinical training

- Exposure to great research during the MD
- Opportunities for clinical experiences during the PhD
- Opportunities to obtain clinical samples for basic science research ("translational research")
- Ongoing curricular events to integrate the two career paths
Advantages of the Duke program

• The **only** MD/PhD program that provides complete clinical training prior to the PhD

• The clinical experience informs the research experience – may determine its direction

• Shorter MD helps ensure that neither degree is short-changed

• May shorten the time to both degrees

• Only a few other programs offer partial clinical training prior to the PhD: Yale, Iowa, Vanderbilt, etc.
What does an MD/PhD program do for you?

- MSTPs are judged every 5 years on their trainees’ success and program structure
- Provide programming to ensure trainees are well prepared:
  - Scientific guidance (with grad program)
  - Career guidance
  - Exposure to excellent scientists
  - Build a strong student community
  - Events: weekly lunches, monthly science dinners, annual retreat and symposium, social events
After: What can I do with the dual degree?
Combining research and clinical training

• After graduation most graduates (~95%) enter residency (post-graduate clinical training)
• Residency (specialty) and fellowship (subspecialty) generally last 3-7 years (some exceptions)
• Most graduates seek residencies in research-focused programs
• Long-term goal: a career with 80% time dedicated to research, 20% clinical
Program Choices for Duke MSTP Grads

- Pathology
- Medicine
- Pediatrics
- Psychiatry
- Anesthesiology
- Neurology
- Dermatology
- Radiation Oncology
- Obstetrics and Gynecology
- Radiology

Percentage in each Specialty:

- 1966-2010
- 2001-2010
The next steps

• Transition to independence requires additional research time
• Usually during a fellowship (during or after residency)
• Establish new research directions
• Apply for career development (K) awards from NIH
• Obtain mentored faculty position for 2-3 years
• Start independent lab
Typical career development timeline

MSTP → Residency/Fellowship → K_mentored → K_indep → New Investigator

Clinical Research/Clinical → Faculty

F32/T32 → K App → R01 App
Common career options with an MD/PhD

• Academic physician-scientist
  – 80/20 research/clinical
  – 100% research, usually in basic science dept.

• Research institute – NIH, etc.
• Pharmaceutical industry
Career choices of MD-PhD alumni

- Academia: 67%
- Private Practice: 16%
- Industry: 8%
- Res. Institute: 4%
- Unknown: 5%

Long-term goal

- Obtain a faculty position at an academic medical center
- Start your own lab
- Obtain independent funding, ideally from the NIH (R01 grant)
- Merge your own particular scientific and clinical interests and have fun!
Additional resources

• Duke MSTP:
  – http://mstp.duke.edu/
  – mstp@duke.edu

• AAMC MD/PhD Information:
  – https://www.aamc.org/students/research/mdphd/

• AAMC Podcast: “Joint MD/Ph.D. Degrees Combine the Best of Science and Medicine”:
  – https://www.aamc.org/podcasts/aspiringdocs/271476/md-phd.html

• MD/PhD: Is it right for me? (PDF):

• Summary of MD/PhD Programs and Policies:
  – https://www.aamc.org/students/download/62760/data/faqtable.pdf
Thanks

• Duke Undergraduate Research Society  
  – Chirag Vasavda
• Research Scholars Program  
  – Rui Dai
• Duke Genome Research and Education Society  
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