MD-PhD: Is it Right for me?

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

- **Application Process**
- **Training**
- **Careers**

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Learn
Serve
Lead

Association of American Medical Colleges

Tomorrow's Doctors, Tomorrow's Cures®

What distinguishes physician scientists from physicians?

Physicians

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

Scientists

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

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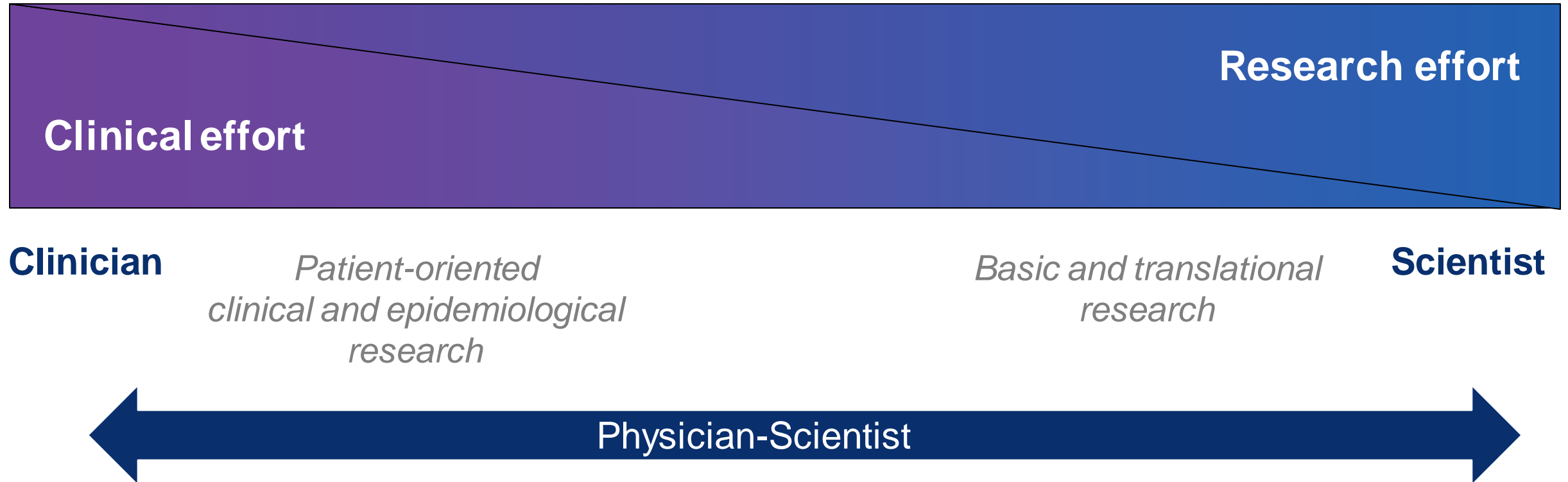# MD-PhD graduates sit at the *intersection of science and medicine*
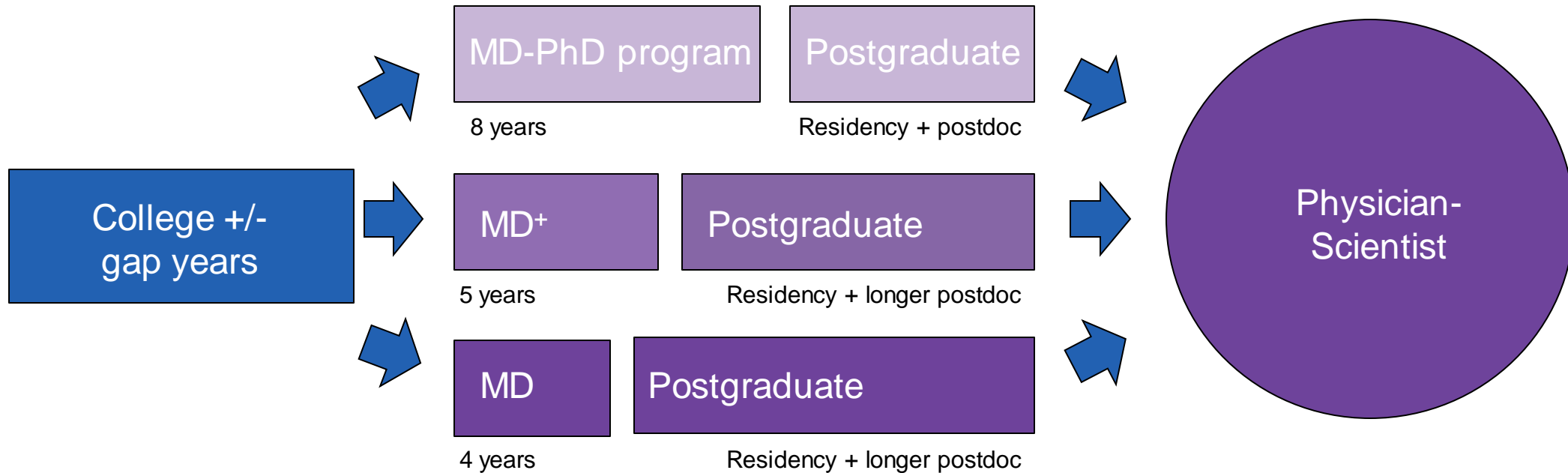
Science   Medicine

The physician scientist pipeline is so important that the government and institutions are invested in your education – paying for your tuition and benefits

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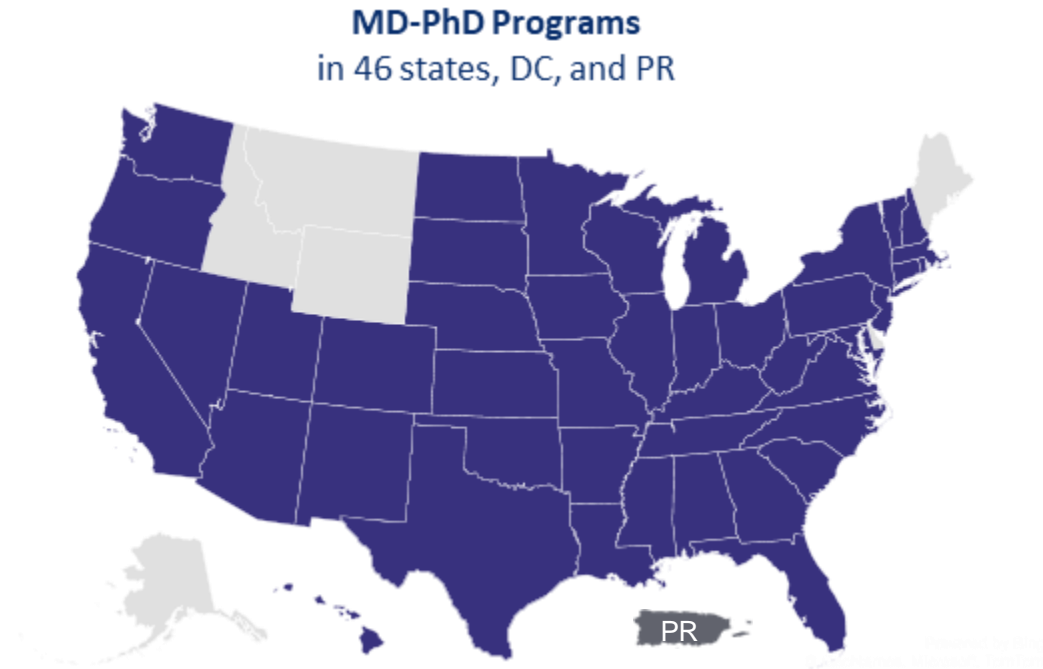# Physician-Scientists: A Spectrum from Clinician to Scientist

Research effort

Clinical effort

Clinician

Patient-oriented clinical and epidemiological research

Basic and translational research

Scientist

Physician-Scientist

Adapted from McKinney, Acad Med, 2017

How do we train physician-scientists?

College +/- gap years

MD-PhD program
8 years

Postgraduate
Residency + postdoc

MD+
5 years

Postgraduate
Residency + longer postdoc

MD
4 years

Postgraduate
Residency + longer postdoc

Physician-Scientist

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
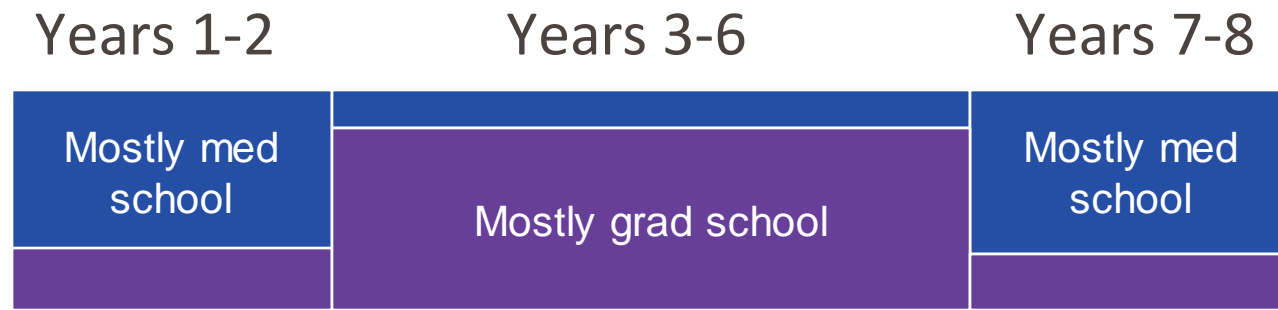
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Where is MD-PhD training done?

- 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
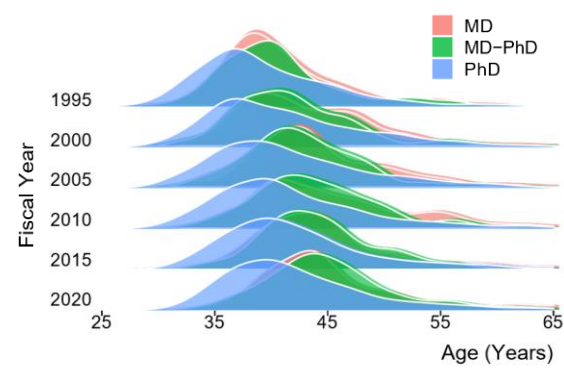
MD-PhD Programs
in 46 states, DC, and PR

PR

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MD-PhD Program Overview

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

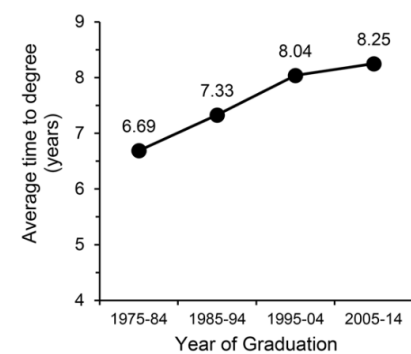| Years 1-2	Years 3-6	Years 7-8
Mostly med school	Mostly grad school	Mostly med school

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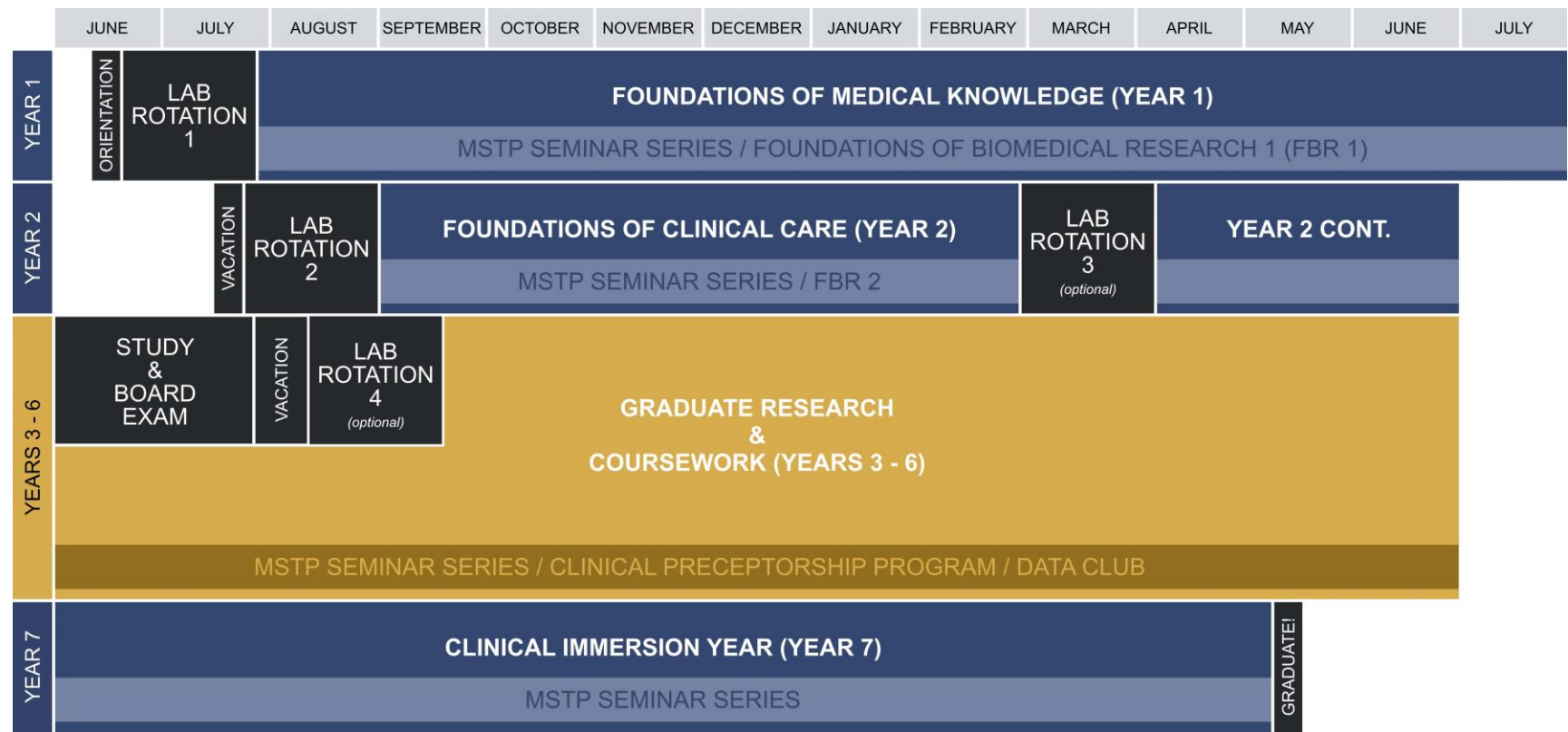
Challenges:Solutions

1) Increasing time to independence

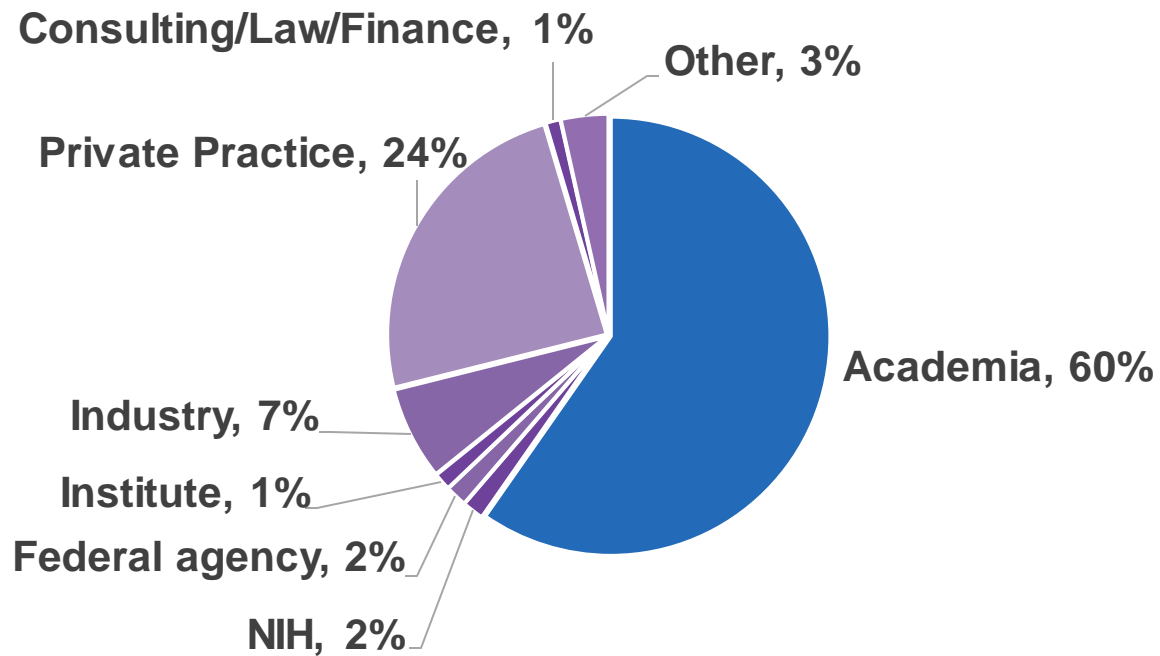## 2) Longer MD-PhD time to degree

Vanderbilt MSTP Curriculum 2.0

Brass, LF, JCI Insight, 2021
Lauer, M "Open Mic", NIH, 2022

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Vanderbilt MSTP Class of 2023 Residency Match

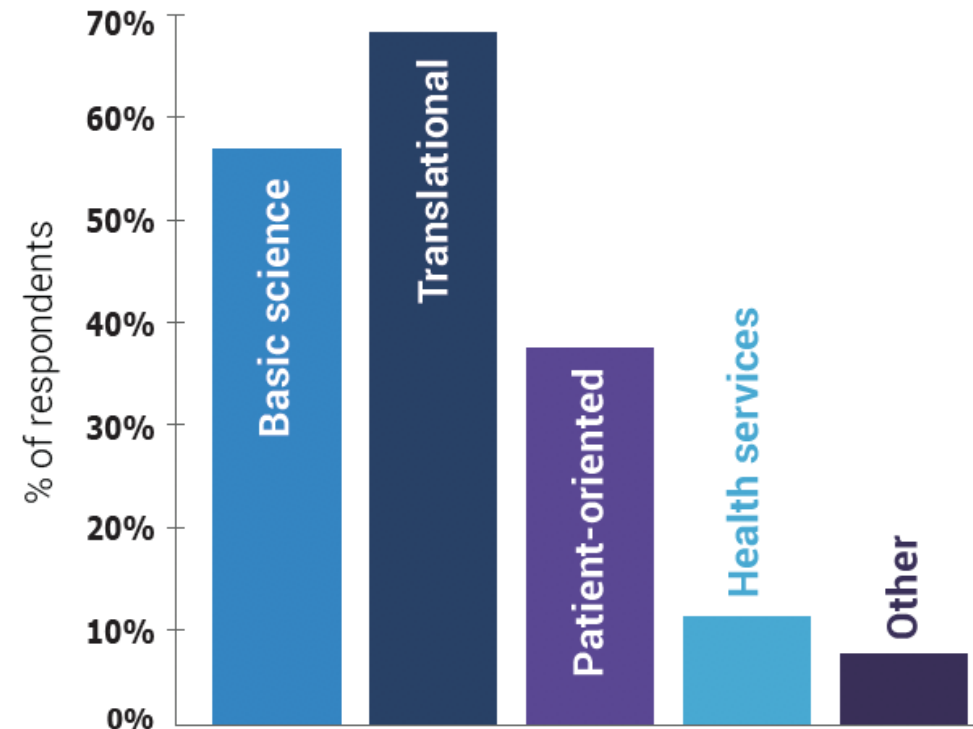|		
Margaret Axelrod	Pathology	Washington University in St. Louis
Connor Beebout	Internal Medicine	University of California – San Diego
Rachel Brown	Internal Medicine	Vanderbilt University Medical Center
Bridget Collins	Child Neurology	Children's Hospital of Philadelphia
Courtney Edwards	Pediatrics	Johns Hopkins University
Brynna Eisele	Psychiatry	Duke University Medical Center
Benjamin Fowler	Pediatrics	Boston Children's Hospital
JooEun "Jay" Kang	Anesthesia	Brigham & Women's Hospital
Matt Madden	Pathology	Yale University
Evonne McArthur	Internal Medicine	University of Washington
Kelsey McNew	Obstetrics/Gynecology	Duke University Medical Center
Ayesha Muhammad	Anesthesia	University of Michigan
Christopher Peek	Pediatrics	Baylor College of Medicine
Brad Reinfeld	Internal Medicine	University of California – Los Angeles
Maxwell Roeske	Psychiatry	Vanderbilt University Medical Center
Danny Sack	Internal Medicine	University of Pennsylvania
Christiaan "Chris" Wijers	Pediatrics	Boston Children's Hospital
Matthew Wleklinkski	Pediatrics	University of Cincinnati

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MD-PhD Careers: long term outcomes

MD-PhDs conduct various types of research.

Consulting/Law/Finance, 1%
Other, 3%
Private Practice, 24%
Academia, 60%
Industry, 7%
Institute, 1%
Federal agency, 2%
NIH, 2%

Brass and Akabas, 2019, JCI Insight 4(19):e133009
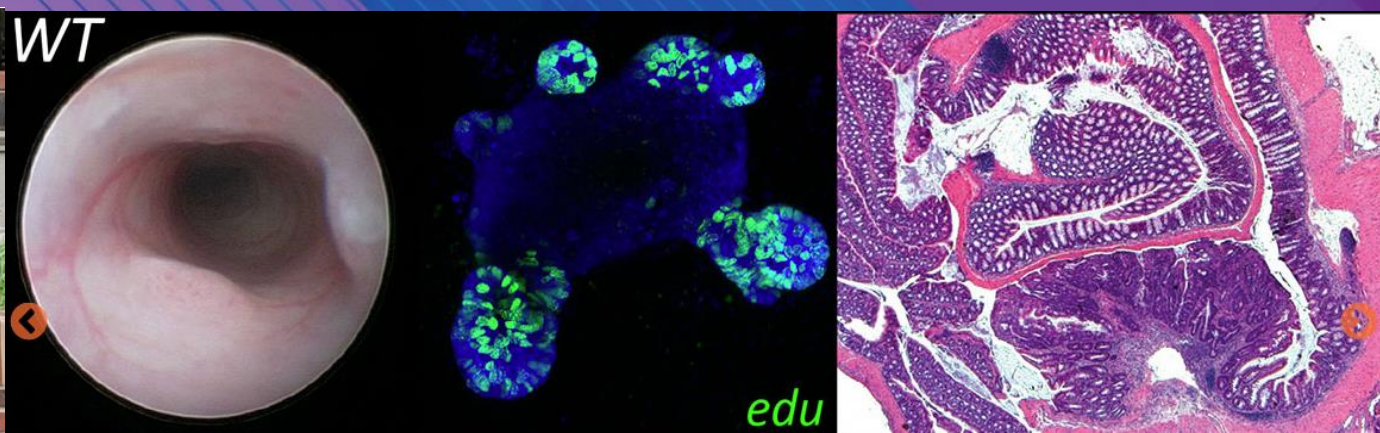The National MD-PhD Program Outcomes Study

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
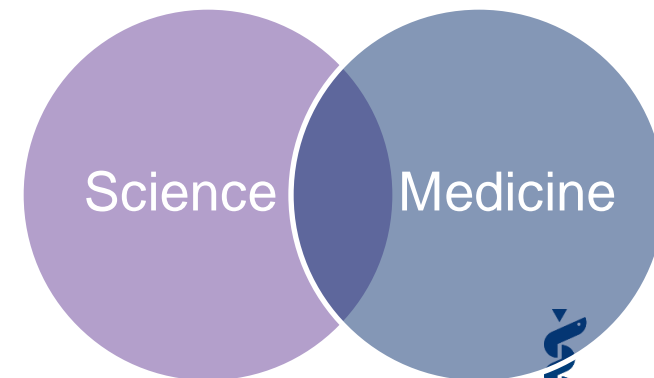
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A Career as a Physician Scientist

Williams Lab

- **Undergraduate at Brigham Young University '92**
- **Research Assistant at University of Utah '92**
- **Vanderbilt MSTP '94-'02**
- **Vanderbilt ABIM Research Pathway (GI) '02**
- **Vanderbilt Assistant Professor '07**

- **MSTP College Advisor '09**
- **MSTP Director '16**

Active clinical practice and research program

Science   Medicine

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Preparing for and Applying to MD-PhD Programs

Elements of a successful MD-PhD application

Holistic review

Productive research

Physician scientist career commitment

Experience in caring for others

Strong academics

Integrity and maturity

Activities and life experiences

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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

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To take a gap year or not?

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

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)

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MD-PhD Statistics

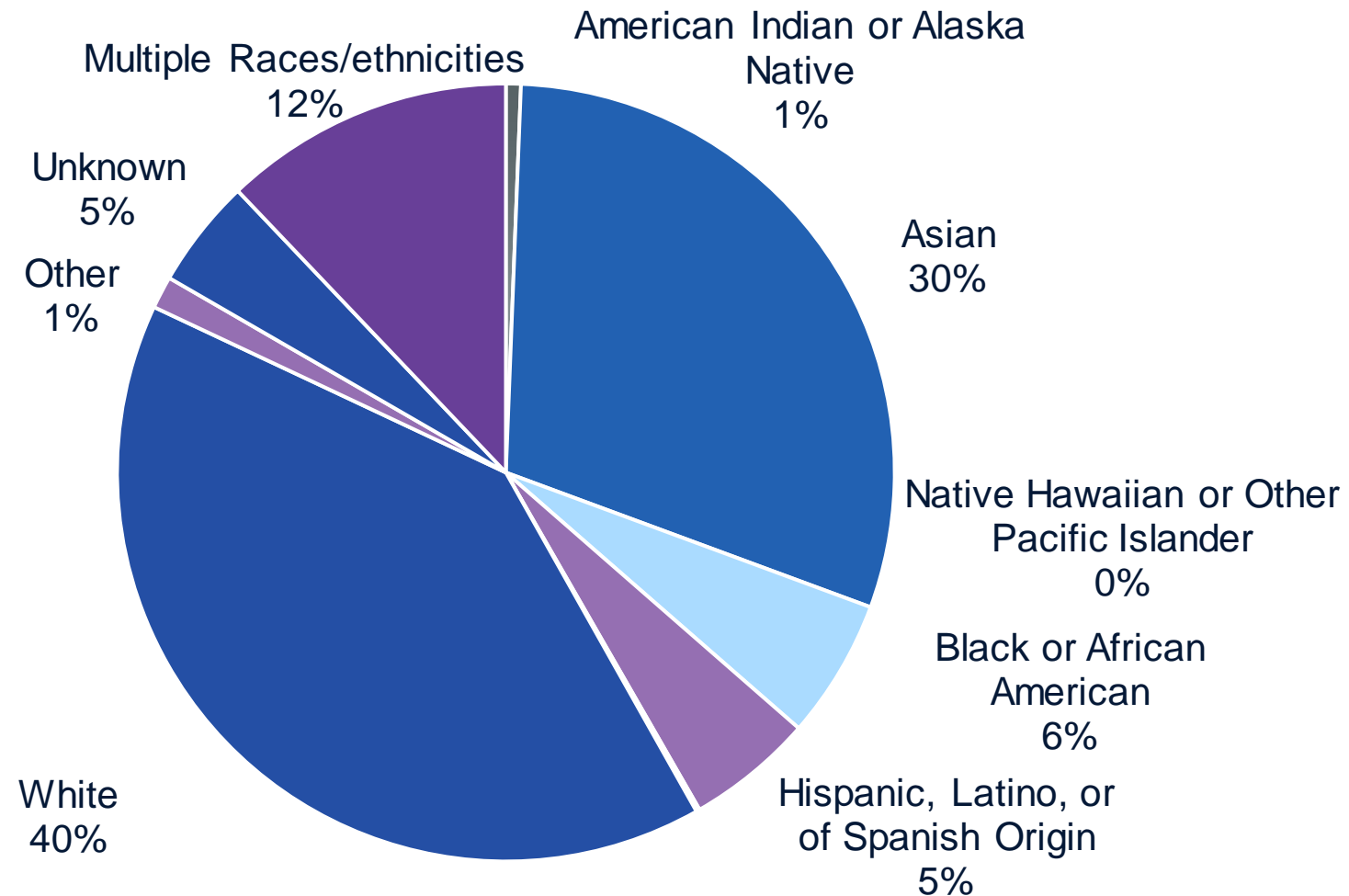- ## 6,005 MD-PhD trainees nationally in 2022-2023 AY

- ## 2021-2022 Application cycle (matriculated Summer/Fall 2022):

  - 1,793 MD-PhD applicants (>62K straight MD)

  - 17 applications submitted/applicant (avg)

  - 709 matriculants: ~40% of MD-PhD applicants entered an MD-PhD Program in 2022

    - 51% women

    - 11.4% racial/ethnic URM

    - 11.7% multi racial/ethnicity

*AAMC Table B-7/B-8/B-9/B-12: MD-PhD Matriculant Tables

MD-PhD Applicant Statistics (Class entering 2022)

	Mean	Range
Total applicant pool (n = 1,793)		
MCAT	511.3	473 – 528
GPA	3.68	1.88 – 4.0
Matriculants (n = 709), 39.5%		
MCAT	516	490 – 528
GPA	3.82	2.73 – 4.0

AAMC Table B-10: MCAT® Scores and GPAs for MD-PhD Applicants and Matriculants to U.S. Medical Schools, 2023-2023

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Self-identification of MD-PhD matriculants:
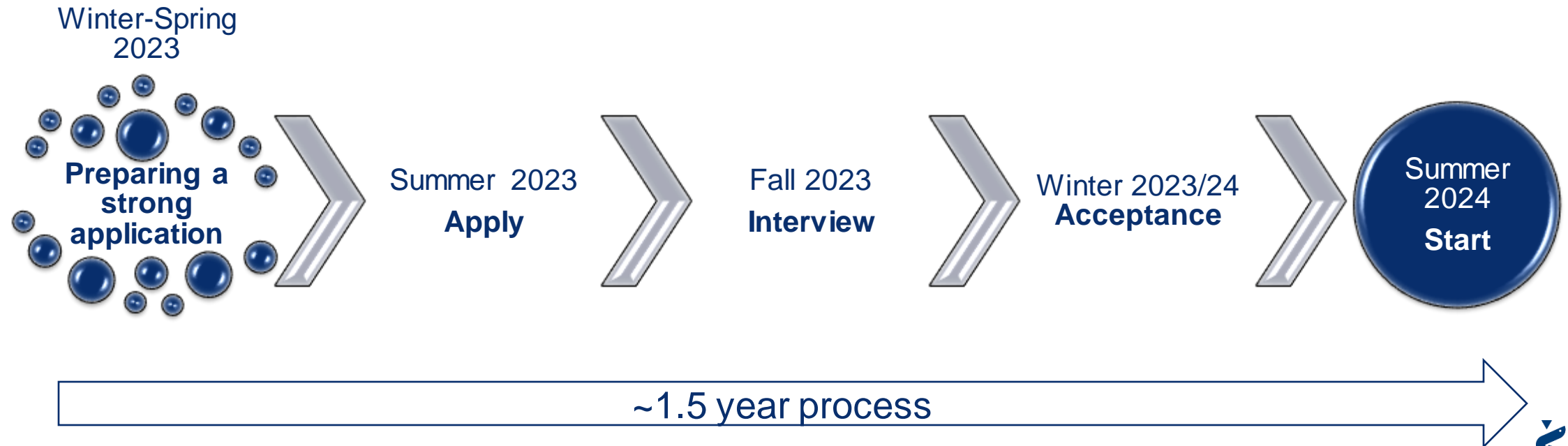goal to increase the physician scientist workforce diversity

American Indian or Alaska Native
1%

Asian
30%

Native Hawaiian or Other Pacific Islander
0%

Black or African American
6%

Hispanic, Latino, or of Spanish Origin
5%

White
40%

Other
1%

Unknown
5%

Multiple Races/ethnicities
12%

*AAMC Table B-7/B-8/B-9/B-12: MD-PhD Matriculant Tables

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Application Timeline
Candidates Matriculating in the Summer of 2024

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

Winter-Spring 2023

Preparing a strong application

Summer 2023
Apply

Fall 2023
Interview

Winter 2023/24
Acceptance

Summer 2024
Start

~1.5 year process

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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

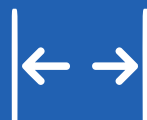- A sense of inclusion

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Myths: Successful MD-PhD applicants:

...need higher scores than MD applicants

FACT: Review of MD/PhD applicants is holistic, the most important part of the application is physician-scientist potential

...must take at least one gap year after college

FACT: 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

...must have publications

FACT: Review of MD/PhD applicants is holistic, the most important part of the application is physician-scientist potential

...have always known about this career path

FACT: Successful MD/PhD applicants arrive via diverse and meaningful pathways; those who have not had exposure previously should seek out opportunities

...start independent research careers later than MD graduates

FACT: MD/PhDs and MDs receive their first NIH R01 award at the same average age.

...wait to start a family until completing training

FACT: Review of MD/PhD applicants is holistic, the most important part of the application is physician-scientist potential

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For more information:

-https://www.aamc.org/mdphd (google AAMC MD-PhD)

-https://www.physicianscientists.org/page/ugresources (google APSA physician-scientist, click on "Resources" -> Undergraduate)

- 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

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For more information:

Attend MSTP VSSA Meet & Greet on Wed, July 5 at 5:30pm in 238 EBL to meet current MSTP students. Food provided. Must RSVP to receive food.

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-Email mdphd@vanderbilt.edu for additional questions or to set up a meeting

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