



Medical Research Scholars Program *at the* National Institutes of Health

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Office of Clinical Research Training and Medical Education
NIH Clinical Center



National Institutes
of Health
Clinical Center



“NIH’s mission is to seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce illness and disability.”

“....the well trained physician scientist can thoroughly understand, interpret, and properly care for human subjects that involve an intervention. ...”



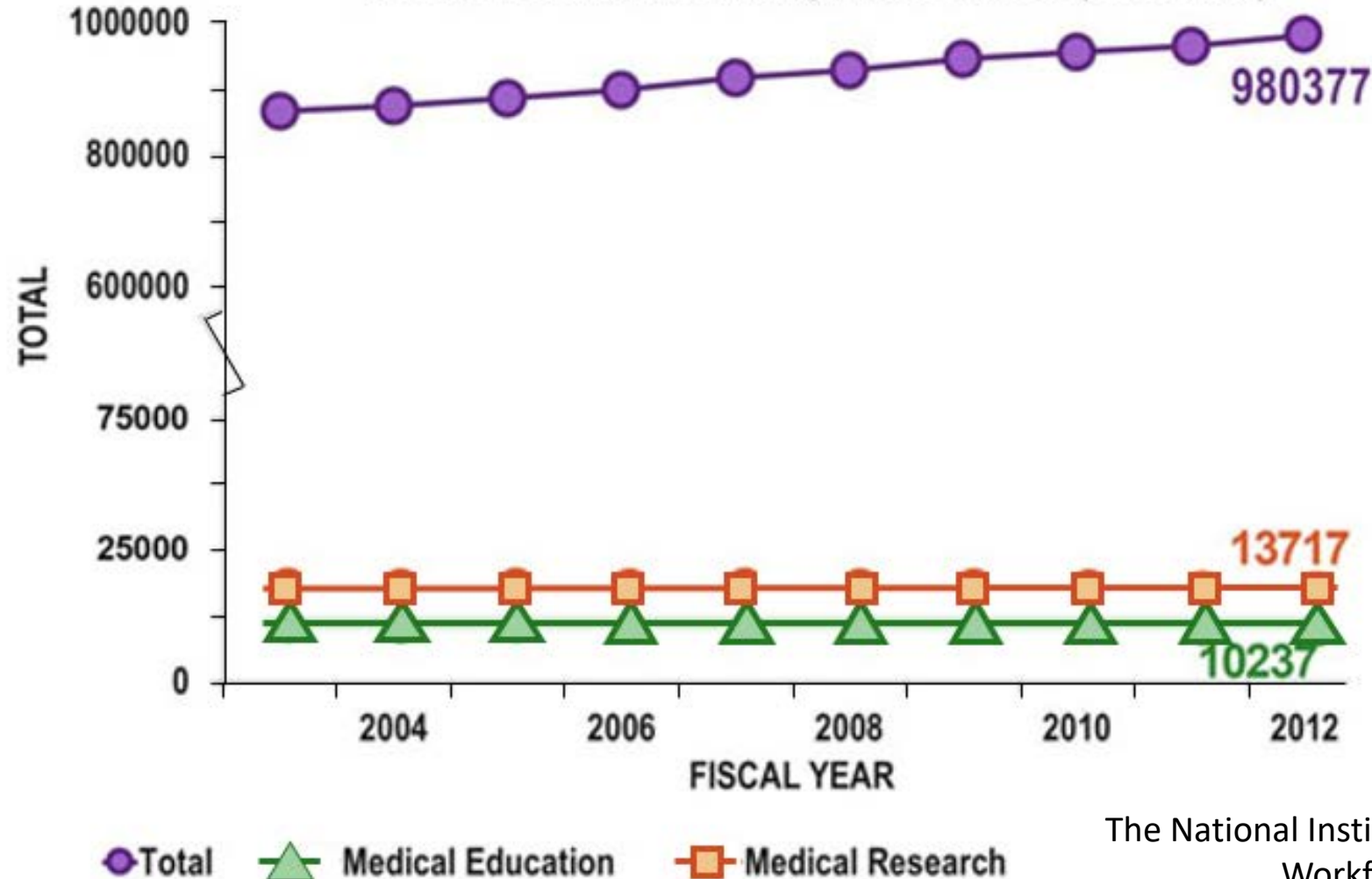
Nathan DG. Clinical research: perceptions, reality, and proposed solutions.
National Institutes of Health Director's Panel on Clinical Research. JAMA. 1998
Oct 28;280(16):1427-31.

The challenge...and the opportunity



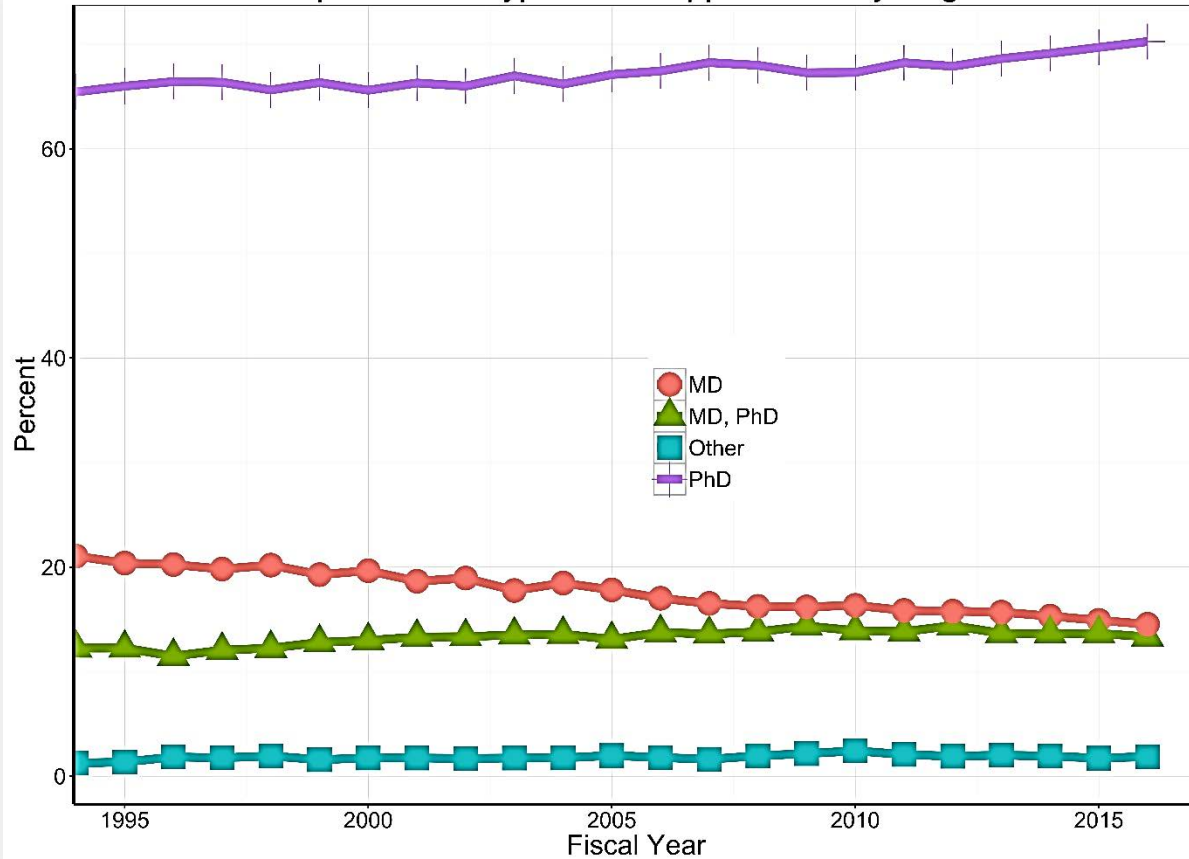
The Physician-Scientist Workforce

Figure 3.1. Number of Physicians Reporting Medical Research, Medical Education as Primary Practice Areas (2003-2012)

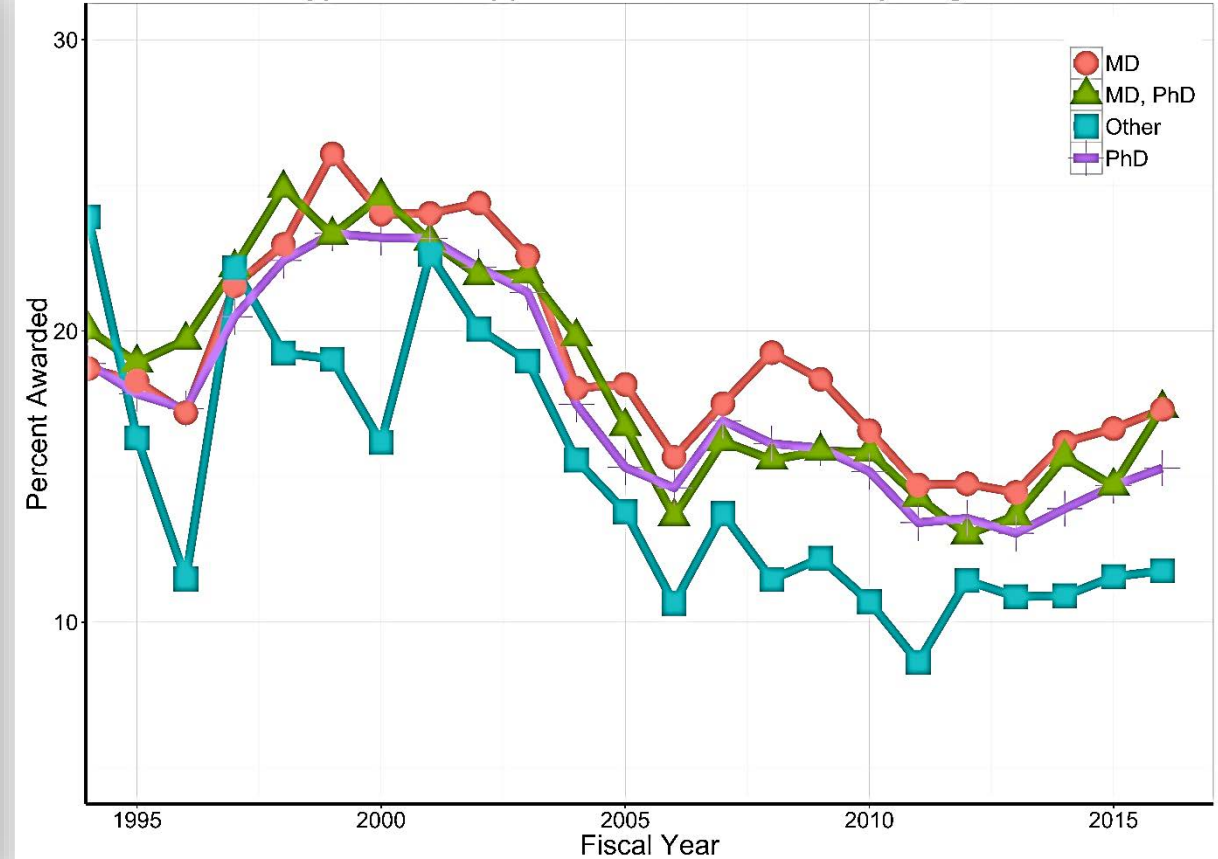


The Physician-Scientist Workforce

Proportions of Type 1 R01 Applications by Degree

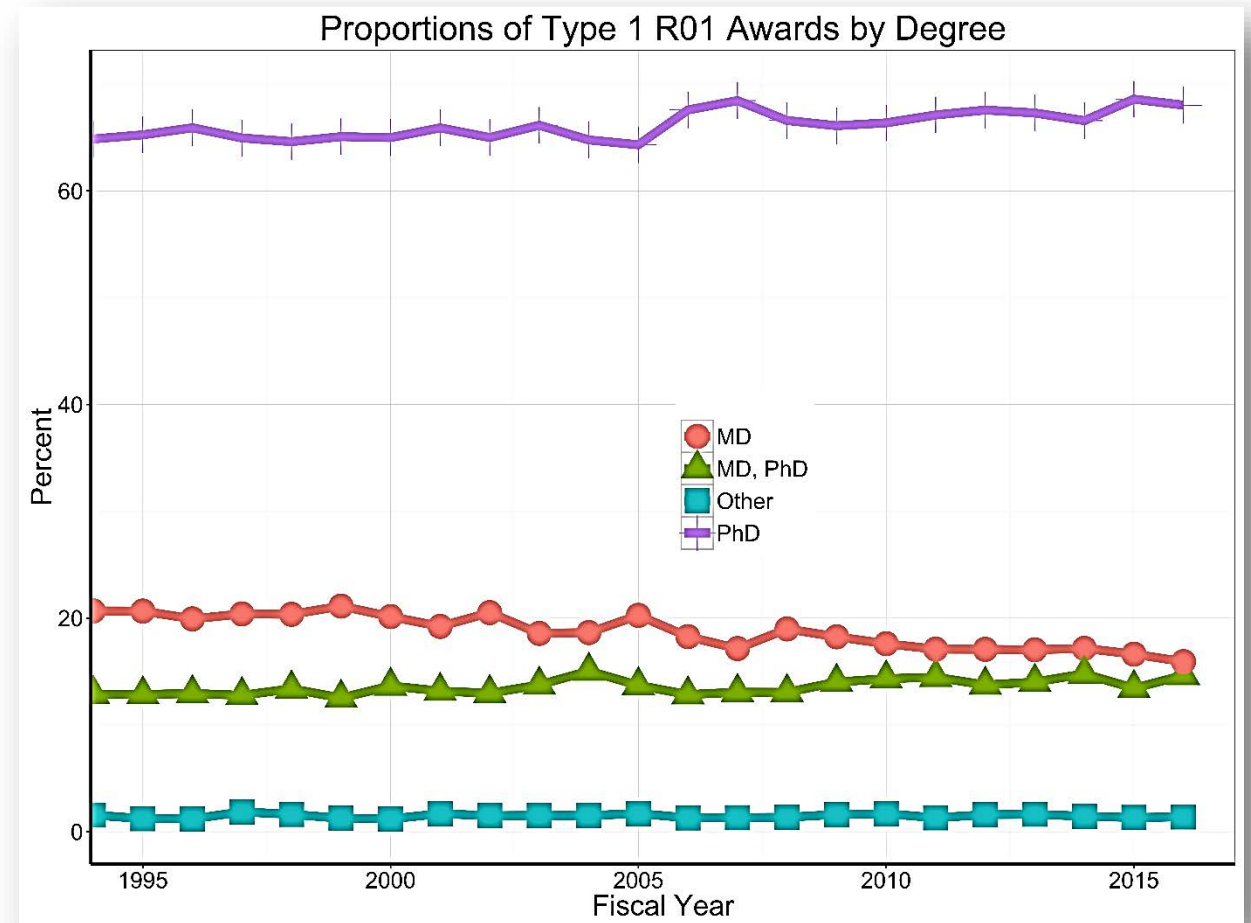
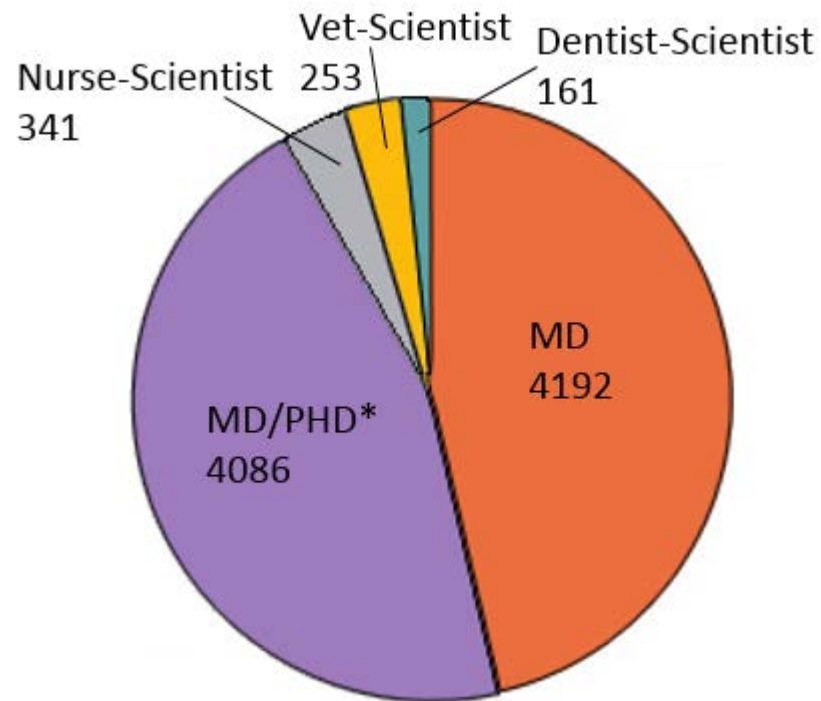


Type 1 R01 Applications Award Rates by Degree



The Physician-Scientist Workforce

Figure 2.1. NIH-funded Physician-Scientist Workforce (FY2008-2012)



Three Core Clinical Center Missions

Performing top-tier science

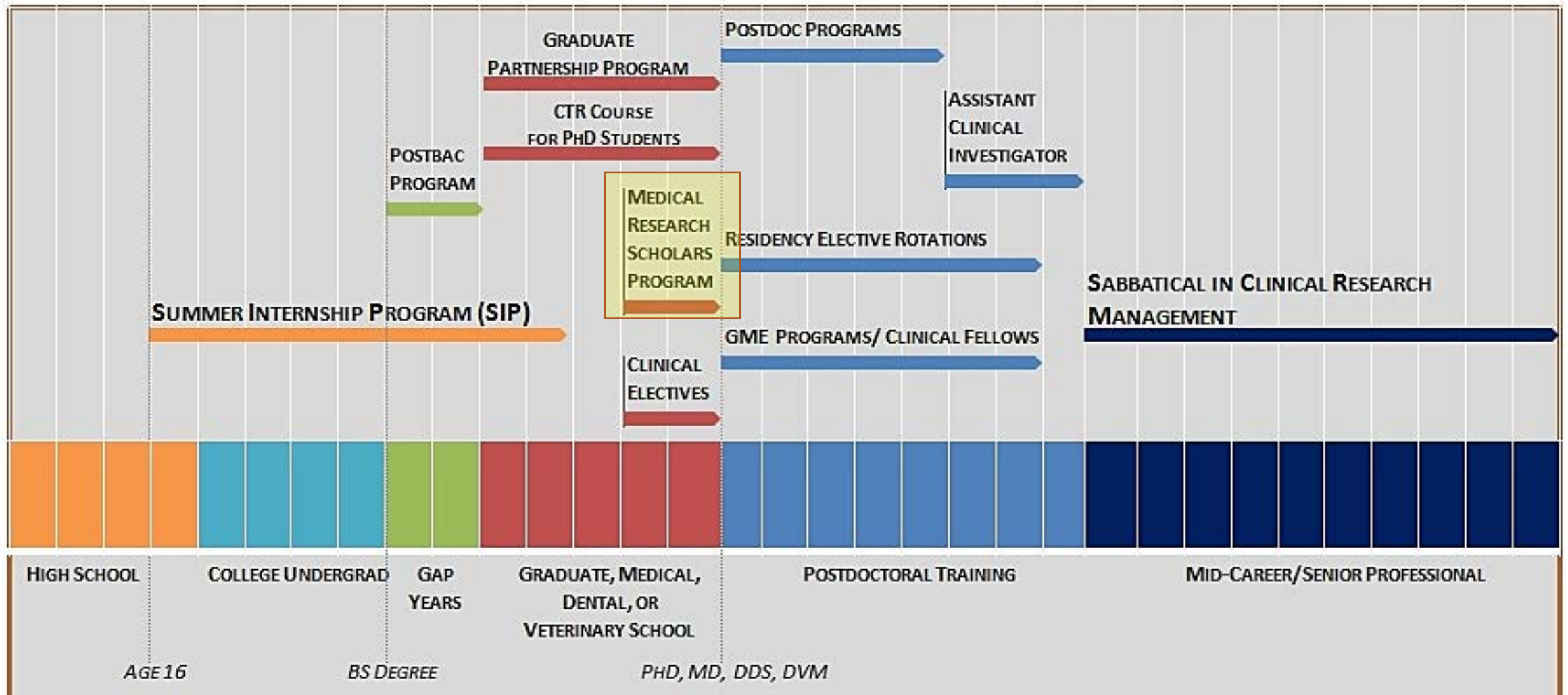


Providing patient care



**Training the next generation of
clinician-scientists**

Portfolio of the Office of Clinical Research Training and Medical Education



NIH Medical Research Scholars Program

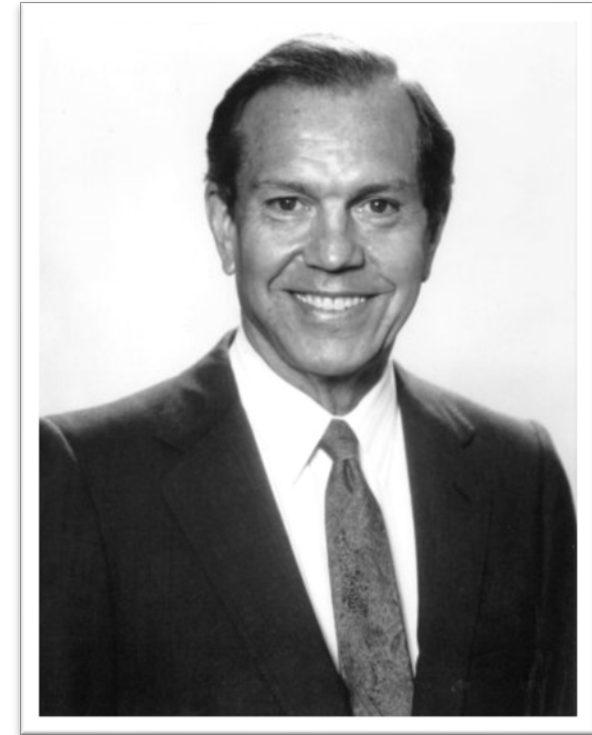
*“Not a research program for medical, dental,
and veterinary students ...*

*but a career development program for
students heading toward careers in biomedical
research that is centered around a robust
investigation experience”*

Origins...

the HHMI-NIH Research Scholars Program

- In 1985, the HHMI-NIH Research Scholars Program, also known as the Cloister Program, was established to give outstanding students at US medical schools the opportunity to receive research training at the National Institutes of Health in Bethesda, Maryland

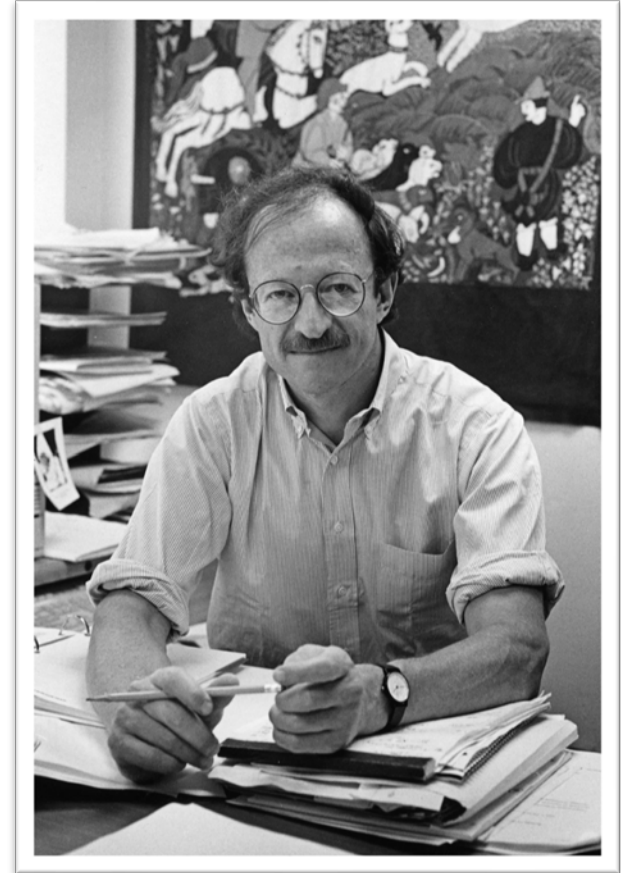


James B. Wyngaarden, M.D.
*Director, National Institutes of Health,
April 29, 1982 - July 31, 1989*

Origins...

Clinical Research Training Program

- In 1995, the NIH Director's Panel on Clinical Research recommended a program to enhance the attractiveness of careers in clinical research to medical students, analogous to the Howard Hughes Medical Institute (HHMI)-NIH Research Scholars
- From 1997 to 2012, CRTP provided a yearlong mentored clinical or translational research opportunity for 340 medical and dental students.



Harold E. Varmus, M.D.
*Director, National Institutes of Health,
November 23, 1993 - December 31, 1999*

NIH Medical Research Scholars Program

“To be the premier training program for future clinician-scientists that advances health by inspiring careers in biomedical research”

- A comprehensive, year-long residential research enrichment program for medical, dental, and veterinary students
- Scholars engage in a mentored basic, translational, or clinical research project in an area that matches their personal interests and career/research goals
- Co-sponsored by the NIH and private partners via contributions to the Foundation for the NIH



Acknowledgement

This research was made possible through the National Institutes of Health (NIH) Medical Research Scholars Program, a public-private partnership supported jointly by the NIH and generous contributions to the Foundation for the NIH from the Doris Duke Charitable Foundation, Genentech, the American Association for Dental Research, the Colgate-Palmolive Company, alumni of student research programs, and other individual supporters via contributions to the Foundation for the National Institutes of Health.

For a complete list, please visit the Foundation website at:

<http://fnihi.org/what-we-do/current-education-and-training-programs/mrsp>

Our Mission

- To ***develop*** the skills and knowledge of talented and highly motivated medical, dental, and veterinary students, enabling them to be future leaders in biomedical research and health care.
- To ***nurture*** research interests and investigative abilities in the fields of basic, translational, and clinical research.
- To ***teach*** how top tier science is conducted
- To ***develop*** effective verbal and written communication skills for the dissemination of science
- To ***instill*** the highest standards of professional behavior

The Program's Curriculum

- **Process of Discovery**

Lectures on seminal basic and clinical research topics that highlight the continuum of discovery, including issues in bioethics, science policy and emerging technologies

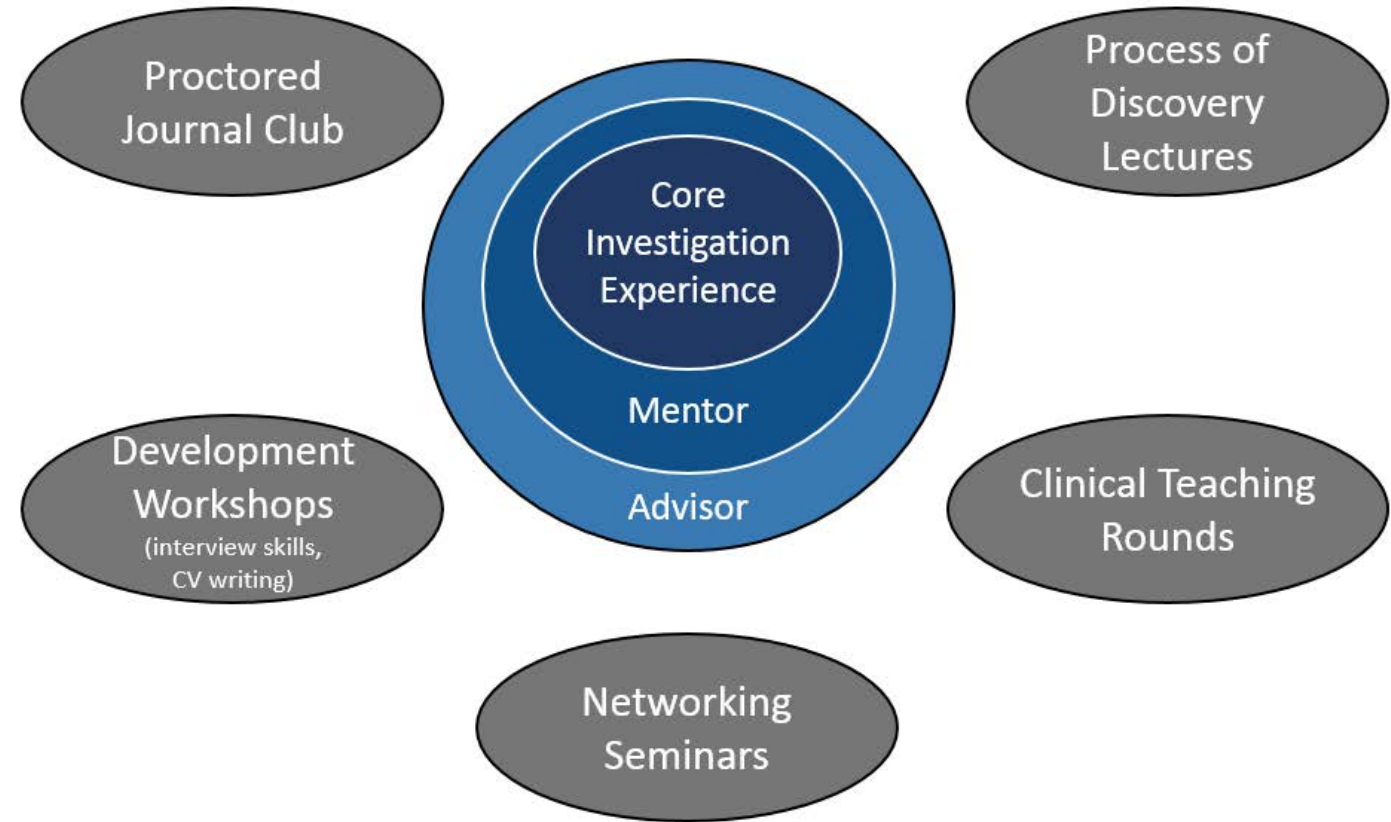
- **Clinical Teaching Rounds**

Select master teacher/investigators present their research in a case-centered forum with participating patients, discussing not just the science of medicine, but the art of clinical care

- **Proctored Journal Club**

- **Workshops** (Peer support, CV writing, interview skills, Work-Life balance)

- **On-going Seminars** by world renowned researchers (Clinical Center Grand Rounds, Demystifying Medicine, Wednesday Afternoon Lecture Series)



Anesthesiology	Transcriptional and Molecular Analyses of Spinal Pain Circuits
★ <u>Cardiology</u>	<u>Effect of Anti-Interleukin-17 Monoclonal Antibody Therapy on Coronary Plaque Characteristics in Psoriasis</u> ★
★ <u>Dental Medicine</u>	<u>Localized Fibrin Accumulation in the Oral Gingiva Leads to Severe Periodontal Bone Loss</u> ★
Dermatology	Assessing the Therapeutic Utility of CEACAM1 Blockade in a CRISPR-Cas9-Based Mouse Melanoma Model
★ <u>Genetics (REI)</u>	<u>Investigating PRDM9, a Rapidly Evolving Regulator of Genetic Recombination</u> ★
Infectious Diseases	Phylogenetic Analyses of Early HIV Epidemic in Washington, DC
★ <u>Interventional Radiology</u>	<u>An Image-Based Evaluation of IVC Filter Implant Healing in a Swine Model: Implications for Performance and Retrievability</u> ★
★ <u>Neuro-psychiatry</u>	<u>7q11.23 Copy Number Variation Impacts White Matter Microstructure as Measured by Multicomponent Driven Equilibrium Single Pulse Observation of T1 and T2 (mcDESPOT)</u> ★
Neurosurgery	Combination of PP2A Inhibition & PD-1 Blockade Synergistically Induces Regression of Murine Intracranial Glioblastoma
★ <u>Oncology</u>	<u>Targeting CD200 as an Immune Checkpoint in Merkel Cell Carcinoma</u> ★
Oncology	Immunotherapy Utilizing the Combination of NK and ADCC Mediating Agents with PARP Inhibition
Ophthalmology	Deep Learning and its Applications to the Age-Related Eye Disease Studies: An Imaging and Text-Mining Approach
Pediatric Neurology	PIEZO2 Deficiency Syndrome: Clinical Manifestations and In Vitro Cellular Modelling
Pediatric Oncology	A Therapeutic Strategy for Targeting N-Myc Driven Neuroblastoma using Epigenetic Small Molecule Inhibitors in Combination with Topoisomerase Inhibitors
★ <u>Population Health/Disparities</u>	<u>Secondhand Smoke vs. Secondhand Vapor: Prevalence and Associated Characteristics Among Youth in Florida</u> ★
★ <u>Population Health/Disparities</u>	<u>Relationship Between Neighborhood Socioeconomic Deprivation and Telomere Length: NHANES 1999-2002</u> ★
Urology	Multiparametric Magnetic Resonance Image-Guided Robotic Radical Prostatectomy After Neoadjuvant Enzalutamide and Androgen Deprivation Therapy

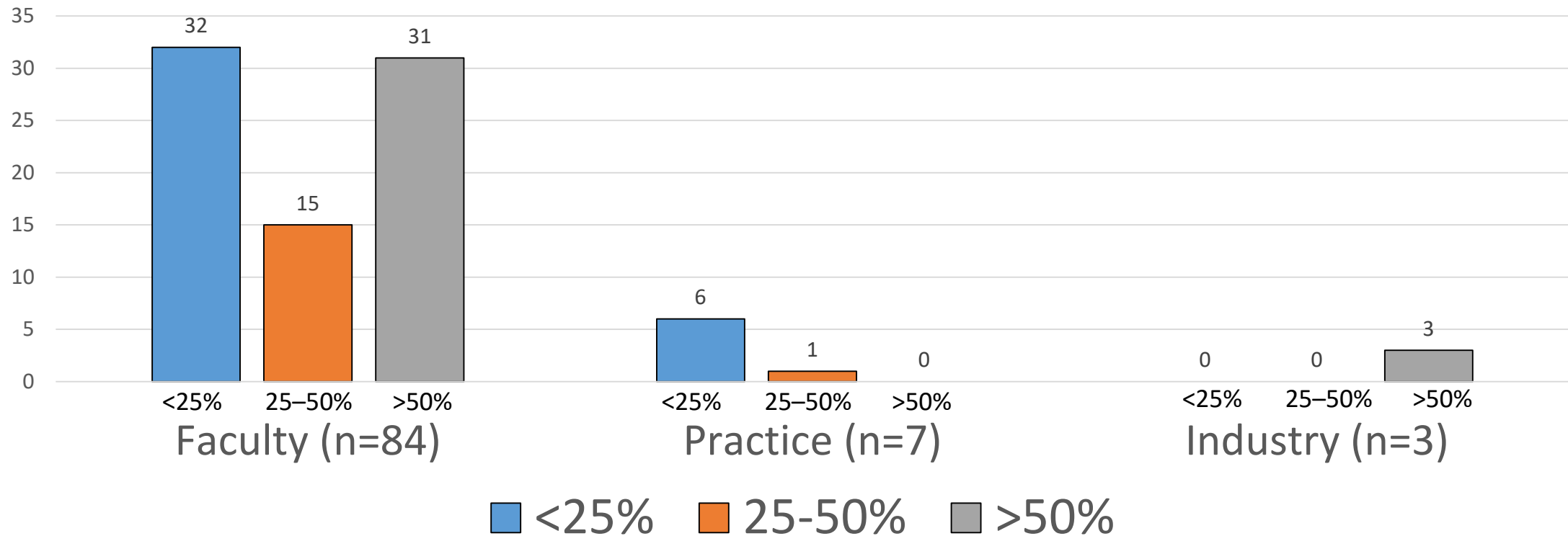
What do Scholars investigate?

Outcomes: most graduates participate in research during residency....

Residency	No. of residents	Research in residency	% doing research
Anesthesiology	2	1	50%
Dermatology	14	4	29%
Emergency Medicine	6	3	50%
Internal Medicine	34	25	74%
IM/Pediatrics	2	2	100%
Neurology	5	5	100%
Obstetrics/Gynecology	1	1	100%
Ophthalmology	7	5	71%
Pediatrics	17	15	88%
Psychiatry	3	3	100%
Radiation Oncology	3	3	100%
Radiology	12	5	42%
Surgery (including Dentistry)	20	11	55%

Program outcomes: Clinical Research Training Program ('97-'12)

Research Time Allotted, CTRP Alumni



Program Outcomes:

Example of hematology/oncology

CRTP ('97-'12)

- **23, or 7%** entered hematology/ oncology
- **13 of 23** completed all post-doctoral training
 - **10 of 23** are currently in residency/fellowship
 - **7 of 13 (46%)**, current/past full-time faculty positions at major academic research-centered departments. (1 now in industry)
 - **4 of 13 (31%)** currently hold senior directorship positions in Biotech/Pharma (Chief Medical Officer, Medical Director, Clinical Trials Director)
 - **3 (15%)**, two are practice-based trialists, and one is a Hem/Onc practitioner

MRSP ('12-'18)

MRSP Year Grp	# Students	Pursued Hem/Onc Research Projects	
		#	%
2012-13	45	5 (all accepted into Hem/Onc fellowships)	11%
2013-14	45	3 (all accepted)	7%
2014-15	42	3	7%
2015-16	55	8	15%
2016-17	52	5	10%
2017-18	42	3	7%

MRSP Alumni, to date

- Since 2012, MRSP has supported **319** scholars in pursuing basic, translational, and clinical research
- Alumni surveyed (30% return)
 - 53% of alumni participated in research while in residency training
 - 53% of alumni published at least one scholarly publication AFTER receiving their professional degree
 - 22 of 25 alumni who have completed their residencies went on to enter fellowship training

Accomplishments

For the ***Class of 2018-2019***, the 37 scholars participated in a wide range of disciplines, from investigations in animal models for cancer, to advanced imaging, to studies in socioeconomic factors in healthcare utilization

- **Papers to date***
 - Published (first author/total): 25 (6 first authored by MRSP scholars)
 - In press (first author/total): 6 (3 first authored by MRSP scholars)
 - Submitted (first author/total): 23 (9 first authored by MRSP scholars)
- **Abstracts, total** 44
 - Oral (first author only): 8
 - Poster (first author only): 35
- **Meetings** 65
- **Awards (National, local, travel)** 18

(*numerous other papers are currently in preparation)

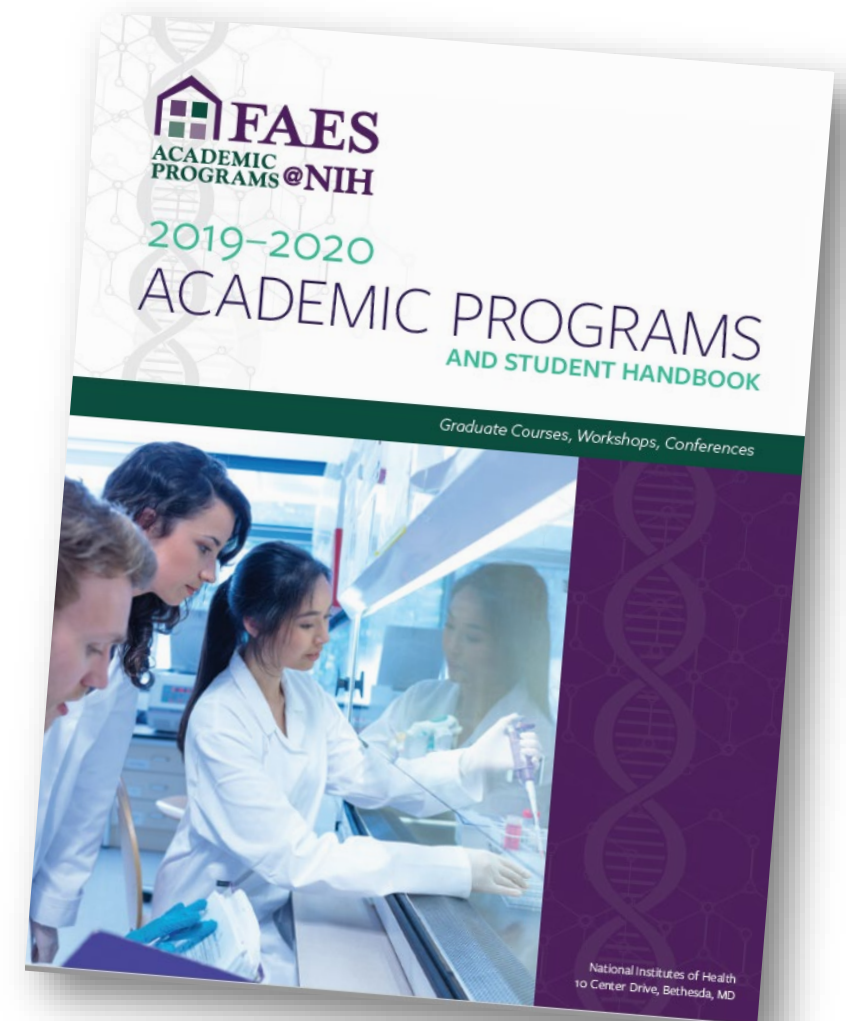
Accomplishments

For the ***Class of 2018-2019***, the 37 scholars participated in a wide range of disciplines, from investigations in animal models for cancer, to advanced imaging, to studies in socioeconomic factors in healthcare utilization

- ***Scholarly tracks***
 - **2 students** were accepted into the **NIH OxCam PhD program**
 - **1 student** was accepted into the **GPP program with University College London**
 - **1 student** was accepted as a **post-doctoral research fellow (DVM)**
 - **1 student** was accepted as a **2nd year IRTA to continue research**

Opportunities...

- Technologies
 - Flow cytometry, CRISPR, state-of-the-art imaging modalities with processing and analysis
- On-campus courses with Foundation for Advanced Education in the Sciences
- Statistical programming
- Publications, Travel, Public Speaking



MRSP Class profile, '19-'20

Class size

- 50 Scholars

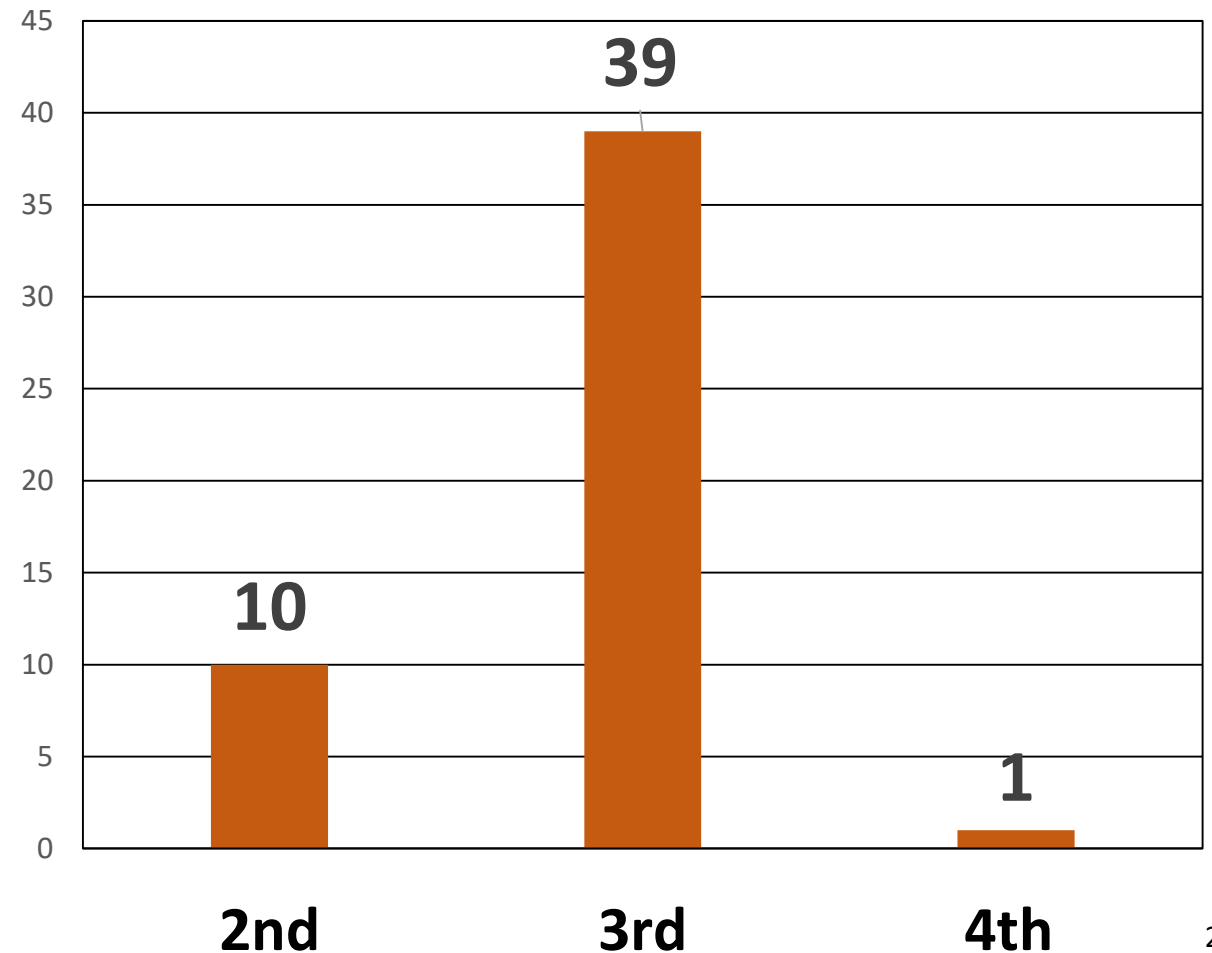
URM representation

- 11 Scholars (22%)

Gender

- 23 women (46%)
- 27 men (54%)

Class Year Distribution



Currently represented schools

Cleveland Clinic Lerner College of Medicine
Dartmouth School of Medicine
East Carolina University School of Dental Medicine
Florida International University
Florida State University College of Medicine
George Washington University
Georgetown University
Icahn School of Medicine at Mount Sinai
Indiana University
Jacobs School of Medicine at University at Buffalo
Thomas Jefferson University
Louisiana State University
Michigan State University
Northwestern University
Ohio State University
Rush Medical College
Saint Louis University
SUNY Downstate College of Medicine

SUNY Upstate College of Medicine
Touro College of Osteopathic Medicine
University of Missouri - Kansas City
University of California, Los Angeles
University of Illinois
University of Kansas
University of Maryland
University of Michigan
University of Oklahoma
University of Pennsylvania
University of Pennsylvania School of Dental Medicine
University of Rochester School of Medicine
University of South California
University of Texas at San Antonio
University of Virginia School of Medicine
University of Washington
University of Wisconsin
Wake Forest University
Wayne State University
West Virginia University
Western University - College of Osteopathic Med. of Pacific



NIH MRSP Scholar Benefit Package

- 12-month stipend (\$38,100)
- Relocation expenses to and from Bethesda
- Residential furnished housing on NIH campus
- Health insurance
- Personal education fund for domestic conference travel, scientific courses and textbooks
 - Additional conference travel supported by research mentors

2019-2020 NIH Medical Research Scholars Program Timetable

October 1 st	Application website opens
November 7 th	MRSP informational webinar (1:00 pm, EST)
January 10th	Application deadline (5 pm, EST)
Mid February	Notification of Interview
March 2 nd	MRSP Interviews (on the NIH campus)
Mid March	Notification of Selection
Mid March	Uniform Deadline to Accept (MRSP, Sarnoff, and Doris Duke)
July	Students Arrive at NIH to begin year

Outreach

- Webinars: both general and school specific
- Regional school visits
- Outreach to medical school deans
- Student association annual meetings
 - American Association of Medical Colleges
 - Student National Medical Association Annual Meeting
 - Latino Medical Student Association Annual Meeting
- Twitter @CCMedEd 
- Instagram @ccmeded 

Thank you for your support.