Topics

I. Why Is It Important for Physicians to Engage in Research?
II. Why Do Physicians Pursue Research Careers?
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VI. Research Residency
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Why is it important for physicians to participate in medical research?

- Physicians and other health care professionals are at the interface of the delivery of clinical care and clinical outcomes
  - Understand and utilize scientific tools to tackle health care problems
“The role of the physician-scientist is ever so important that we all have the unique responsibility of making sure that the best and brightest are encouraged, mentored, and supported so that they can make significant investigative contributions to our healing art, the art of medicine.”

“The art of medicine to this day still has more questions than there are answers. On daily ward rounds, there are still vast numbers of questions that are amenable to careful studies with new tools. …The tools for biomedical sciences have developed tremendous capabilities to answer complex questions that will need the insight of healers.

“Young investigative clinicians with great clinical phenotyping capabilities and patient materials are now challenging our system on the mechanism by which they can identify polymorphic genetic markers that may be associated with certain clinical phenotypes. The major challenge for investigative medicine, in particular with regard to the genetic basis of diseases, is to create mechanisms to encourage physicians to identify connections between phenotypes and the genetic makeup of patient populations.”
“Technologies that emerged over the last decade, such as high throughput gene expression profiling, high speed genotyping, and large scale proteomics, should not be available to just a few; rather, these tools should be made generally available to investigative physicians.”

Why do physicians choose to participate in medical research?
Why do physicians choose a research career?

- Curious
- Love to Learn
- Passion to Cure/Solve Problems
- Exciting & Challenging
- Enjoy Change
- Enjoy Arguing
- Enjoy Competition

Why do physicians choose a research career?

- Not Afraid of Hard Work
- Persistent/Perseverance
- Exposure to a great mentor
- The Potential to Affect a Large Number of Patients
- Thrive in an Academic Environment
  - Inquiry/Research
  - Teaching
  - Cutting Edge Clinical Care
  - Process Improvement
Why do physicians choose a research career?

- Christine E. Seidman, M.D.
- HHMI Investigator / 1994–Present
- Scientific Discipline
- Genetics, Medicine and Translational Research
- Dr. Seidman is also a professor of genetics and medicine at Harvard Medical School and director of the Cardiovascular Genetics Center at Brigham and Women’s Hospital, Boston.

“You're going to make mistakes,” says Christine E. Seidman, whose research team studies the genetics of heart disease. “To be a good scientist is to see that stop sign — to turn around and go back in another direction — with the same enthusiasm and belief that you'll be successful again on the next try.” Scientists have diverse personalities, Seidman adds, and they work as a team: “Sometimes you're fighting, sometimes you're disagreeing. But you're also going to play and have a good time, too.”
Why do physicians choose a research career?

http://www.hhmi.org/scientists/bert-vogelstein

Bert Vogelstein, M.D.

HHMI Investigator / 1995–Present

Scientific Discipline - Cancer Biology, Genetics

Dr. Vogelstein is also Clayton Professor of Oncology and Pathology and director of the Ludwig Center for Cancer Genetics and Therapeutics at the Sidney Kimmel Comprehensive Cancer Center of the Johns Hopkins University School of Medicine.

The key thing about being a scientist, "is not being satisfied with the status quo," says Vogelstein, who is interested in identifying and characterizing genes that cause cancer. Even in prestigious journals, "evidence may be true and valid, but the interpretation of that evidence in that paper may not be correct." Along with the need for skepticism, Vogelstein says, experimental scientists need to like working with their hands and doing "aesthetically pleasing" experiments. But he keeps coming back to the bottom line. The first step in getting new knowledge, is "questioning current knowledge and the status quo."

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Why do physicians choose a research career?

http://www.hhmi.org/scientists/huda-y-zoghbi

Huda Y. Zoghbi, M.D.

HHMI Investigator / 1996–Present

Scientific Discipline - Genetics, Neuroscience

Dr. Zoghbi is also a professor in the Departments of Pediatrics, Molecular and Human Genetics, Neuroscience, and Neurology at Baylor College of Medicine.

"Be very observant, motivated, and accepting that to really succeed at something it is OK to fail a few times." These traits define a good scientist, says Huda Zoghbi, a neuroscientist at Baylor College of Medicine where she and her team focus on rare and enigmatic disorders, like Rett syndrome. Zoghbi would add a healthy dose of diligence and a little bit of intuition. There is more than one way to approach a problem and willingness to learn, to be open and exchange ideas, and collaborate with others are key characteristics to being a good scientist.
Why do physicians choose a research career?

- David C. Page, M.D.
- HHMI Investigator / 1990–Present
- Scientific Discipline - Developmental Biology, Genetics
- Dr. Page is also a professor of biology at the Massachusetts Institute of Technology and director of the Whitehead Institute for Biomedical Research.

David Page studies the human sex chromosomes and genes that play critical roles in the making of sperm and eggs. He thinks a scientist has to be intensely curious and intensely skeptical. First and foremost, a good scientist has to be a student, ready to learn. “An additional quality is that you have to be absolutely dogged and determined, because most of the time, your experiments are not going to work.” Science is not for the faint of heart but one has the unique opportunity to fixate on a new understanding or overturning the old.

Anthony S. Fauci, M.D.
NIH/NIAID Director

- Dr. Fauci was appointed Director of NIAID in 1984. He oversees an extensive research portfolio of basic and applied research to prevent, diagnose, and treat infectious diseases such as HIV/AIDS and other sexually transmitted infections, influenza, tuberculosis, malaria and illness from potential agents of bioterrorism.
- NIAID also supports research on transplantation and immune-related illnesses, including autoimmune disorders, asthma and allergies. The NIAID budget for fiscal year 2013 is approximately $4.5 billion.
- Dr. Fauci serves as one of the key advisors to the White House and Department of Health and Human Services on global AIDS issues, and on initiatives to bolster medical and public health preparedness against emerging infectious disease threats such as pandemic influenza.

http://www.niaid.nih.gov/about/directors/biography/Pages/biography.aspx
Anthony S. Fauci, M.D.
NIH/NIAID Director

Dr. Fauci developed effective therapies for formerly fatal inflammatory and immune-mediated diseases such as polyarteritis nodosa, Wegener's granulomatosis, and lymphomatoid granulomatosis. A 1985 Stanford University Arthritis Center Survey of the American Rheumatism Association membership ranked the work of Dr. Fauci on the treatment of polyarteritis nodosa and Wegener’s granulomatosis as one of the most important advances in patient management in rheumatology over the previous 20 years.

- Scientist and Rock Stars = http://youtu.be/qCS89r9rbUk

Are physicians successful in research?
Nobel Prize in Physiology or Medicine

- **Blumberg, Baruch S** MD, For studies on the origin and spread of infectious diseases.
- **Brown, Michael S.** and **Goldstein, Joseph L** MD, For their discovery of cell receptors relating to cholesterol metabolism.
- **Kornberg, Arthur** MD, For work on the production of artificial nucleic acids.
- **Marshall, Barry J** MD, For the discovery of the bacterium *Helicobacter pylori* and its role in gastritis and peptic ulcer disease
Are physicians successful in research?
Nobel Prize in Physiology or Medicine

- Murad, Ferid MD PhD, For discoveries concerning nitric oxide as a signaling molecule in the cardiovascular system.
- Prusiner, Stanley B. MD, For discovery of infectious particles called prions.
- Robbins, Frederick C MD, For work on the cultivation of the poliomyelitis virus in tissue culture systems.
- Thomas, E Donnall MD, For discoveries concerning the transplantation of organs and cells for the treatment of human diseases.
- Yalow, Rosalyn For the development of radioimmunoassays of peptide hormones.

PHYSICIAN RESEARCHER PROFILES at OSUWMC

“All are COM MDSR mentors”
Physicians are Leaders in Research

- Carlo M. Croce M.D.
- Professor and Chair – OSU COM, Department of Molecular Virology, Immunology and Medical Genetics

http://youtu.be/NLdJUYUEUus

A member of the National Academy of Sciences, studies the molecular changes in genes that lead to cancer. He is interested in the early cellular changes of malignancy and how they might serve as targets for new treatment and preventive agents.

He has also discovered a number of cancer-related genes “oncogenes” and “tumor suppressor genes”, including BCL2, ALL1, TCL1, FHIT and LZTS1..

A new class of genes microRNAs mir15 and mir16

A Macro View of MicroRNA

RNA genes of only tens or hundreds of nucleotides have been called the biological equivalent of dark matter— "all around us but almost escaping detection." These genes are found in that portion of DNA that doesn't code for proteins and so was commonly known as "junk DNA," which explains why they received so little research attention until the late 1990s. Nowadays, however, research into these so-called microRNAs (miRNAs) and their role in cellular function and dysfunction—notably, in the latter case, cancer—has blossomed into one of the hottest fields of biology and medicine.

“We will have drugs based on microRNA, and a lot of novel diagnostic and prognostic markers will be developed,”

- Carlo M. Croce MD
Find Out More about Physician Led Research at the OSUWMC

- Michael Caligiuri MD – Professor of Hematology
  - [http://youtu.be/-KooU7AEc-U](http://youtu.be/-KooU7AEc-U)

- Gail Besner, MD - Professor of Surgery and Pediatrics
  - [http://youtu.be/jYSPkEkXE84](http://youtu.be/jYSPkEkXE84)

- Christopher Breuer MD – Professor of Surgery

- Ginny Bumgardner MD PhD – Professor of Surgery
  - [https://youtu.be/5_Jerw0wf78](https://youtu.be/5_Jerw0wf78)

- Gary Smith MD - Professor of Pediatrics

- Subha Raman MD – Professor of Cardiovascular Medicine
  - [http://www.youtube.com/watch?v=8xc1bKNxEmk](http://www.youtube.com/watch?v=8xc1bKNxEmk)
Find Out More about Physician Led Research at the OSUWMC

- Balveen Kaur, PhD, associate professor of Neurological Surgery
  - [http://youtu.be/HyOZS3Zn-CA](http://youtu.be/HyOZS3Zn-CA)

- Michael Knopp, MD, PhD, Professor and Vice Chair of Radiology
  - [https://youtu.be/wwiBRyXbO30](https://youtu.be/wwiBRyXbO30)

- Carlo Croce, MD, Chair, SBS-Molecular Virology, Immunology & Medical Genetics
  - [http://youtu.be/NLdJUYUEUus](http://youtu.be/NLdJUYUEUus)

Questions & Commentary
What types of research do physicians pursue?

- Basic Science
- Translational Science
- Clinical Science
- Population Science
- Implementation Science
- Health Policy Research
- Educational Research
- Community Research
Translational Research

- Translational Research is the conduct of laboratory-to-humans research, applying basic science research to human subjects and moving discoveries and knowledge into initial clinical testing. It is mechanism-oriented clinical research that may include laboratory-based research aimed at clarifying mechanisms of disease; developing measures or markers of disease presence, severity, or improvement; and developing drugs, devices, or interventions to treat disease or to improve health. (UCSF)
- [https://accelerate.ucsf.edu/about/clinical-and-translational](https://accelerate.ucsf.edu/about/clinical-and-translational)
Translational Science Spectrum

- Translational Science Spectrum: The translational science spectrum represents each stage of research along the path from the biological basis of health and disease to interventions that improve the health of individuals and the public. The spectrum is not linear or unidirectional; each stage builds upon and informs the others. At all stages of the spectrum, NCATS develops new approaches, demonstrates their usefulness and disseminates the findings. Patient involvement is a critical feature of all stages in translation (NIH)

- [https://ncats.nih.gov/translation/spectrum](https://ncats.nih.gov/translation/spectrum)

Doris Duke Charitable Foundation

- WHAT THEY FUND
- The mission of the Doris Duke Charitable Foundation (DDCF) is to improve the quality of people’s lives through grants supporting the performing arts, environmental conservation, medical research and child well-being, and through preservation of the cultural and environmental legacy of Doris Duke’s properties. In effort to achieve this mission, the foundation supports four national grant-making programs: the Arts Program, the Child Well-being Program, the Environment Program and the Medical Research Program. It also supports the African Health Initiative as well as the Doris Duke Foundation for Islamic Art, which has one grant-making program: the Building Bridges Program.

- [http://www.ddcf.org/what-we-fund/medical-research/](http://www.ddcf.org/what-we-fund/medical-research/)
2015 Clinical Research Mentorship Grantees

- Estimating the Impact of Indoor Residual Spraying of Insecticide Using a Novel Health Facility-Based Malaria Surveillance Program in Uganda
  - Institution: University of California, San Francisco
  - Research team: Grant Dorsey, M.D., Ph.D., Clinical Scientist Development Award 2006
  - Saned Raouf, University of Colorado School of Medicine

- The Microbiome in Breast Carcinogenesis
  - Institution: Cleveland Clinic Foundation
  - Research team: Charis Eng, M.D., PhD., Distinguished Clinical Scientist Award, 2002
  - Hannah Wang, Cleveland Clinic Lerner College of Medicine at Case Western Reserve University School of Medicine

- Serum Biomarkers to Predict the Development of Steroid Resistant GVHD
  - Institution: Icahn School of Medicine at Mount Sinai
  - Research team: James Ferrara, M.D., Distinguished Clinical Scientist Award 2002
  - Matthew Hartwell, University of Michigan Medical School

- Iron Deficiency in Sickle Cell Anemia
  - Institution: Indiana University
  - Research team: Chandy John, M.D., M.S., Innovations in Clinical Research Award 2013
  - Aubri Carman, University of Arizona College of Medicine

- Modeling Challenges and Interventions for Elimination of Schistosomiasis and Soil-Transmitted Helminths
  - Institution: Stanford University School of Medicine
  - Research team: Eran Bendavid, M.D., Clinical Scientist Development Award 2014
  - Nathan Lo, Stanford University School of Medicine

- Inhaled Corticosteroid Use to Prevent Acute Chest Syndrome Recurrence in Children between One and Four with Sickle Cell Disease: A Multi Institutional Trial
  - Institution: Vanderbilt University
  - Research team: Michael DeBaun M.D., M.P.H., Clinical Scientist Development Award 1999
  - Zalaya Ivy, Meharry Medical College

- Practices Associated with the Ability to Rescue following Delayed Graft Function in Kidney Transplant Recipients
  - Institution: Johns Hopkins University
  - Research team: Dorry Segev, M.D., Ph.D., Clinical Scientist Development Award 2008
  - Shannon Cramm, University of Michigan Medical School

- Live Donor Kidney Transplants: Capturing All-Sources Costs and Utilization
  - Institution: Johns Hopkins University
  - Research team: Dorry Segev, M.D., Ph.D., Clinical Scientist Development Award 2008
  - Joseph Learza, Mount Sinai School of Medicine

- Impact of HIV-Associated Changes in the Gut Microbiome on Disease Progression
  - Institution: Massachusetts General Hospital
  - Research team: Bruce Walker, M.D., Distinguished Clinical Scientist 1999
  - Jesus Luevano Jr., Harvard Medical School
2016 Clinical Research Mentorship Grantees

- Mentee: Tej D. Azad, Stanford University
  - Mentor: Maximilian Diehn, M.D., Ph.D., Stanford University, 2010 Clinical Scientist Development Award
  - Project: Development of a Liquid Biopsy for Pediatric Sarcomas

- Mentee: Victoria S. Bird, Case Western Reserve University
  - Mentor: Charis Eng, M.D., Ph.D., Cleveland Clinic, 2002 Distinguished Clinical Scientist Award
  - Project: The Microbiome in Individuals with PTEN Germline Mutations

- Mentee: Hannah Hill, University of Michigan Medical School
  - Mentor: Santhi K. Ganesh, M.D., University of Michigan, 2013 Clinical Scientist Development Award
  - Project: Finding Genes for Arterial Dysplasia

- Mentee: Hannah Hill, University of Michigan Medical School
  - Mentor: Santhi K. Ganesh, M.D., University of Michigan, 2013 Clinical Scientist Development Award
  - Project: Finding Genes for Arterial Dysplasia

- Mentee: Olivia L. Hulme, Michigan State University College of Human Medicine
  - Mentor: Steven A. Lubitz, M.D., M.P.H., Massachusetts General Hospital, 2014 Clinical Scientist Development Award
  - Project: Predicting Atrial Fibrillation to Inhibit Stroke and Embolism

2016 Clinical Research Mentorship Grantees cont’d

- Mentee: Jessica M. Moore, Johns Hopkins University School of Medicine
  - Mentor: Dorry L. Segev, M.D., Ph.D., Johns Hopkins University, 2008 Clinical Scientist Development Award
  - Project: Improving Patient Education and Informed Consent in Live Kidney Donation Through Creation of an Interactive, Patient-Centered Web Resource

- Mentee: Joanne Soo, Duke University School of Medicine
  - Mentor: Arash Ash Alizadeh, M.D., Ph.D., Stanford University, 2011 Clinical Scientist Development Award
  - Project: Personalization of Cancer Therapy Utilizing Circulating Tumor DNA as Biomarkers

- Mentee: Christopher E. L. Toote II, Duke University School of Medicine
  - Mentor: Sallie R. Permar, M.D., Ph.D., Duke University, 2010 Clinical Scientist Development Award
  - Project: The B Cell Repertoire and Antibody Maturation Elicited by Adjuvanted HIV Envelope Vaccines in Infants

- Mentee: Jennifer M. Tymon, Loyola of Chicago, Stritch School of Medicine
  - Mentor: Russell E. Ware, M.D., Ph.D., Cincinnati Children’s Hospital Medical Center, 2010 Innovations in Clinical Research Award
  - Project: Effects of Hydroxyurea Treatment on Transcranial Doppler Velocities and Stroke Risk in Children with Sickle Cell Anemia

- Mentee: Timothy Wong, Robert Wood Johnson Medical School
  - Mentor: Volney Sheen, M.D., Ph.D., Beth Israel Deaconess Medical Center, 2007 Clinical Scientist Development Award
  - Project: The Role of Vesicle Trafficking in Alzheimer’s disease and Down syndrome: A Predictive Biomarker
Questions & Commentary

PHYSICIAN RESEARCH TRAINING PATHS
When do physicians decide if they want to pursue a research career?

- Variable along an academic career path:
  - High School
  - Undergraduate
  - Physician-Scientist MD PhD Pathway
    - Medical School
    - Residency
    - Fellowship
    - Faculty

How do physicians-in-training pursue a research career?

- One step at a time
  - Full time Summer research in Medical School
  - Part-time research during the Academic Year
  - Full time research for 1-2 years (leave of absence)
  - Pursue masters degree
  - Pursue specialized training at a workshop/course
  - Convert from MD to dual degree MD PhD pathway
  - Continue research in residency/fellowship
  - Apply for an academic position as a junior faculty
How do physicians balance a clinical and research career?

- Some have 100% research career
- Most have some combination of research and clinical practice
- Pursue research relevant to their clinical practice/expertise
- Work with other investigators/teams
- "Protected Time" for research in academic centers
- Success in funding is key to build your team

How do physicians obtain funding to do research?

- Build your research CV to be competitive for career development award & research grant opportunities
- Search for medical student research funding opportunities in your "field"
- Learn about grant opportunities specifically designated for MDs
- Learn about NIH centers, institutes and processes
- Access mentors and others to help you
OSU Medical Students Experiences

- NIH MRSP (Medical Research Scholars Program) for 2015-2016
- Janini Singaravelu, M4
- Ophthalmology research at the National Eye Institute

The National Institutes of Health (NIH) Medical Research Scholars Program (MRSP) is a comprehensive, year-long research enrichment program designed to attract the most creative, research-oriented medical, dental, and veterinary students to the intramural campus of the NIH in Bethesda, MD.

How do medical students try out research?

- Know your resources

- Do some background work on research opportunities

- Seek a mentor who can provide you with research experience in a clinical field of interest
Questions & Commentary

Sources of Funding for Medical Student Research
Prestigious Medical Student Research Funding Opportunities

- Medical Student Research Fellowships
  - HHMI
  - NIH
  - AOA
  - Sarnoff Cardiovascular Foundation
  - Doris Duke Clinical Research Fellowship
  - Fogarty International Clinical Research Scholars Program
  - Foundations (AHA, ADA, AAS, …)

NIH Medical Research Scholars Program for Pre-Professional Students

NIH Announces New Research Scholars Program-

The Medical Research Scholars Program (MRSP) is a comprehensive, year-long research enrichment program designed to attract the most creative, research-oriented medical, dental, and veterinary students to the intramural campus of the NIH in Bethesda, MD. Student scholars engage in a mentored basic, clinical, or translational research project on the main NIH campus in Bethesda, or at close by NIH facilities, that matches their professional interests and career goals. The MRSP is designed to prepare clinician-scientists for leadership roles in biomedical research and will offer research experiences in basic science laboratories and in clinical and translational research conducted at the NIH Clinical Center. The MRSP application cycle for 2016-2017 will open on October 1, 2016.

http://www.cc.nih.gov/training/mrsp/index.html
Physicians-in-Training

- T32 (CCTS TL1) training grants for pre-professional students
- Specialty Specific Foundation grants for medical students
- HHMI, Sarnoff, Fogarty, NIH Research Scholars

Questions & Commentary
RESEARCH RESIDENCY

Neurological Surgery & National Institutes of Health

The Surgical Neurology Branch of the National Institutes of Neurological Disorders and Stroke (NINDS) at the National Institutes of Health (NIH) offers an innovative 7-year, ACGME-accredited Neurological Surgery Residency-Training Program under the sponsorship of the NIH Clinical Center in collaboration with the University of Virginia.

Combined Clinical & Research Training

Clinical training is provided at the NIH Clinical Center and the University of Virginia. At the NIH, clinical training takes place under the mentorship of 5 full-time neurosurgical faculty. Because of the intense research-focus of the clinical service, nearly every case is complex, and residents are exposed to the latest technologies, including intraoperative magnetic resonance imaging and convection-enhanced delivery. At the University of Virginia, trainees will perform their junior residency and chief residency, under the direction of 11 full-time faculty. There, they will gain early and extensive experience in the treatment of diverse neurosurgical pathologies.
Neurological Surgery & National Institutes of Health

Research Training  Research training will take place at the NIH. Residents can work either within the Surgical Neurology Branch, or can call upon the significant resources of the NIH intramural research program, to identify a research project. Specific emphasis will be placed on preclinical research as well as the design of a prospective clinical research protocol, to be completed during the training period. The curriculum is designed for trainees to become future clinician-scientists and leaders in this dynamic field.

OSU Faculty Resource:  Russell Lonser MD, Chair of Neurosurgery

OSU Medical Student Resource: Christopher Hong

Yale Pediatric Scientist Development Program (PSDP) Training the Next Generation of Pediatric Scientists

This program is designed to provide research training relevant to specialty areas of pediatrics and to prepare entry-level faculty for research careers in academic pediatrics. Physicians presently in pediatric training programs who wish to train in basic, translational, or clinical research with an established investigator/mentor are encouraged to apply, as are candidates who seek training in epidemiology/statistics, informatics, health services, or health policy. A commitment to an investigative academic career is essential. Candidates completing the Pediatric Scientist Development Program (PSDP) are eligible for sub-specialty boards, since PSDP training typically takes place after completion of the clinical fellowship year(s).
Questions & Commentary

ARE THERE PROFESSIONAL ORGANIZATIONS FOR PHYSICIANS WITH RESEARCH CAREERS?
Are there professional organizations for physicians with research careers?

- The ASCI is an honor society of physician-scientists, those who translate findings in the laboratory to the advancement of clinical practice.
- **APSA: American Physician Scientist Association**
  - The American Physician Scientists Association (APSA) is a national organization dedicated to addressing the needs of future physician scientists with respect to their training and career development.
  - [http://www.the-asci.org/](http://www.the-asci.org/)

Are OSU medical students involved with professional organizations for physicians with research careers?

- **APSA: American Physician Scientist Association**

  Executive Council 2013-2014:

  - **Kate Hartmann** is an MD/PhD candidate at The Ohio State University Medical Scientist Training Program. She received a BA in Biology from Cornell University in 2010. At Ohio State, Ms. Hartmann works in the lab of Wolfgang Sadee. Her research interests focus on explaining the missing heritability of coronary artery disease by identifying key epistatic interactions. She currently serves as President of the OSU Medical Scientist Student Organization. Within APSA, Ms. Hartmann has served as the Chair of the Annual Meeting Committee and is currently the Chair of Events.
  - [http://www.physicianscientists.org](http://www.physicianscientists.org)
American Physician Scientists Association

Mr. Christopher Alvarez-Breckenridge 2013
Residency: Massachusetts General Hospital - Neurosurgery
Undergraduate: The Ohio State University
Biomedical Sciences Graduate Program
Advisor: Michael Caligiuri, MD

Dissertation: The Role of Natural Killer cells in the Context of Oncolytic Herpes Simplex Virotherapy for Glioblastoma. As an undergraduate, he was named a Barry M. Goldwater Scholar as a sophomore and a Thomas J. Bardos Scholar as a Junior. Mr. Alvarez-Breckenridge has continued to be an active member of his community and school. His leadership positions have included his appointment to The Ohio State University Board of Trustees by Governor Bob Taft (2006-2008), and his appointment to the American Medical Association Foundation Board of Directors (2008-2009). Mr. Alvarez-Breckenridge has served as Vice-President of APSA (2008-2009) and was recently elected to be the President of APSA in 2010-2011. During this upcoming year (2009-2010), he will be serving as the President-Elect of APSA and as an ex-officio member of the Board of Directors of APSA. Mr. Alvarez-Breckenridge joins the APSA Board of Directors in July of 2009.

American Physician Scientists Association

Jillian Liu
Vice-Chair, Events Committee

Jillian Liu is a third-year MD/PhD student in The Ohio State University Medical Scientist Training Program in Columbus, Ohio. She attended Cornell College in Mount Vernon, Iowa where she graduated with a BSS in Biochemistry & Molecular Biology and Psychology. She is currently a first-year graduate student in The Center for Gene Therapy at Nationwide Children’s Hospital, where her research focuses on non-cell-autonomous mechanisms of motor neuron death in Amyotrophic Lateral Sclerosis. Jillian has previously served on the Executive Committee of the APSA Midwest Regional Meeting, which was held at OSU in 2013, and currently serves as OSU’s APSA Institutional Representative. She is an avid consumer of audiobooks, PRX podcasts, and black coffee.
American Society of Clinical Investigation (ASCI)

- About the Society
  - The ASCI is an honor society of physician-scientists, those who translate findings in the laboratory to the advancement of clinical practice. Founded in 1908, the Society is home to more than 3,000 members who are in the upper ranks of academic medicine and industry.
  - [http://www.the-asci.org/](http://www.the-asci.org/)

APSA
Membership Categories & Dues

- Full Member
  - MD/PhD or DO/PhD trainee, residents, fellows:
    - $25 annually, or $125 for the duration of the training program
  - MD or DO students, residents, fellows involved in qualified research training experiences*, based on Membership Committee approval:
    - $25 annually, or $85 for 5 years

- Associate Member
  - MD or DO students, residents, fellows not yet engaged in research, premedical undergraduate students, individuals not yet enrolled in medical school, or anyone who does fit the requirements of Full Membership or Emeritus Membership:
    - $25 annually, $12 for premedical undergraduate students.

[http://www.physicianscientists.org/](http://www.physicianscientists.org/)
Introduction to Academic Radiology (ITAR) program

- How to apply for the RSNA Introduction to Academic Radiology (ITAR) program.
- We would like to invite you to apply for the RSNA Introduction to Academic Radiology (ITAR) program. As part of a new collaboration between RSNA and APSA, two medical students will be selected to travel to the RSNA Annual Meeting in Chicago for this special 4-day seminar to be held from Nov. 29 - Dec. 3, 2015. A $1000 stipend will be awarded by RSNA to the selected students to offset travel and lodging costs.
- To be considered, candidates must be current trainees in an accredited MD or MD/PhD program and must demonstrate academic radiology interest. Chosen candidates must have significant research experience of one (1) year or more. Applications will also be considered from candidates interested in pursuing careers in radiology-related specialties (i.e. radiation oncology and nuclear medicine).
- [http://www.rsna.org/](http://www.rsna.org/)

Annual AMA Research Symposium

**When & Where:** Nov. 11, 2016, Orlando Florida

**Qualifications:**

- All medical student (includes medical students enrolled in joint degree programs, e.g., MD/PhD, MD/MPH, etc.), resident, fellow and international medical graduate (ECFMG-certified candidates who are awaiting residency) members of the AMA are invited to submit abstracts of their scientific research.
- Co-authors are not required to be AMA members, but please note that only one first author who submits will be allowed to present and therefore be eligible to win a prize.
- You must be present to discuss your research during the scheduled judging period on Nov. 11, 2016.

**Deadlines:** Abstracts for the 2016 AMA Research Symposium will be accepted beginning in June 2016 and Due August 17

Questions & Commentary

HOW DO I GET STARTED???
How do I get started?

- Visit the Medical Student Research Trainees website [http://medicine.osu.edu/go/mdsr](http://medicine.osu.edu/go/mdsr)
- Attend MDSR Informational Sessions
- Become involved with Landacre Research Interest Group and/or Landacre Honor Society
- Talk to OSU medical and MD PhD students who have done research
  - [http://go.osu.edu/MDSRevents](http://go.osu.edu/MDSRevents)
  - [http://go.osu.edu/LANDACRE](http://go.osu.edu/LANDACRE)

MDSR Program

- Medical Student Research Program Office
  - 1190A Graves Hall, 685-9106
  - research.education@osumc.edu
- Medical Student Research Program Website
  - [http://medicine.osu.edu/go/mdsr](http://medicine.osu.edu/go/mdsr)
- MDSR Newsletter
  - [http://go.osu.edu/MDSRnews](http://go.osu.edu/MDSRnews)
MDSR Newsletter Student Profiles

Derrick Knapik, during his fellowship, Derrick directed an independent project examining the inflammatory pathways in trauma to assess the ability of exercise to down-regulate inflammatory mediators. He also investigated the clinical utility and molecular ramifications of continuous passive motion therapy and novel cartilage restoration techniques.

Vanessa Stagliano, studying health literacy and ways to improve physician-patient communication. Stagliano presented research at the North American Primary Care Research Group conference in New Orleans last year and her and Wallace's paper titled “Brief Health Literacy Screening Items Predict Newest Vital Sign Scores” was recently published in the *Journal of the American Board of Family Medicine*.

David Clever, made the change from medical school to the MD/PhD program and is focused on exploring novel mechanisms to enhance the human immune system's ability to recognize, respond to, and eliminate metastatic cancer.

http://go.osu.edu/MDSRnews

http://medicine.osu.edu/go/mdsr
What's Next?

*EBIR in LSI*
August 24th, 2016
9:30 – 10:30
160 Meiling

*Exploring Medical Research in the Summer*
How to Prepare a Research Scholarship Application to Fund your Research Experience
September 16th, 2016
LSI Module

*Medical Student Research Opportunities Fair*
Monday October 10th, 2016 (tentative date)
5:00 - 6:30 pm
115 Biomedical Research Tower

*MDSRS Research Symposium*
Monday October 31st, 2016
115 Biomedical Research Tower

Questions