Improving People's Lives Through Innovations in Personalized Health Care

Research Careers in Medicine
August 20, 2015

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Associate Dean for Research Education
Topics

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Why is it important for physicians to engage 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
PHYSICIAN RESEARCHER
PROFILES

HHMI INVESTIGATORS…

WHAT IT TAKES TO BE A
SCIENTIST
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."
Why do physicians choose a research career?

- [http://www.hhmi.org/scientists/huda-y-zoghbi](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](http://www.niaid.nih.gov/about/directors/biography/Pages/biography.aspx)
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](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

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

- Christopher Breuer MD – Professor of Surgery
  - http://youtu.be/UMefjlahSSw
Find Out More about Physician Led Research at the OSUWMC

- Ginny Bumgardner MD PhD – Professor of Surgery
  - [http://youtu.be/-KooU7AEc-U](http://youtu.be/-KooU7AEc-U)

- 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

- Michael Knopp, MD, PhD, Professor and Vice Chair of Radiology
  - http://youtu.be/OdtwiZSXiMA

- Carlo Croce, MD, Chair, SBS-Molecular Virology, Immunology & Medical Genetics
  - http://youtu.be/NLdJUYUEUus
Questions & Commentary
What types of research do physicians pursue?
What type of research do physicians pursue?

- Basic Science
- Translational Science
- Clinical Science
- Population Science
- Implementation Science
- Health Policy Research
- Educational Research
- Community Research
Disease-Oriented Research
Doris Duke Charitable Foundation
call for applications on Sickle Cell Disease

▪ About Sickle Cell Disease

▪ Sickle cell disease is both a national and global health concern. Many of the more than 70,000 people living with sickle cell disease in the United States face a lifetime of painful, debilitating and expensive health problems, with a much-shortened life expectancy. Sickle cell disease takes an even heavier toll abroad, where an estimated 230,000 children are born with the disease each year in sub-Saharan Africa alone.

▪ Symptoms originate, through mechanisms that are not entirely understood, from the circulation of abnormally shaped sickle red blood cells throughout the body. Sickle-shaped red blood cells clump in blood vessels thereby obstructing normal blood flow to vital organs, including the brain and lungs—resulting in strokes and a high susceptibility to respiratory and other types of infections. Obstructed blood supply to tissues also results in episodes of extreme pain.
Disease-Oriented Research
Doris Duke Charitable Foundation call for applications on Sickle Cell Disease

- The mission of the **Doris Duke Charitable Foundation** is to improve the quality of people’s lives through grants supporting medical research. Since 1998, the foundation’s Medical Research Program has sought to advance the prevention, prediction, diagnosis and treatment of human disease by strengthening and supporting clinical research.

- **About the Innovations in Clinical Research Award (ICRA)**. ICRA, a competitive grant program that began in 2000, provides seed funding for early-stage, multi-disciplinary clinical research projects. Through ICRA, the Medical Research Program has funded 56 projects, ranging from HIV diagnostic development to cardiovascular disease research, with a total commitment of approximately $16 million.

- For the 2011 ICRA competition, the Medical Research Program received 85 applications from investigators at 60 research institutions, which were reviewed by a panel of 12 experts in blood disorders.
2012 Doris Duke Foundation
Innovative Clinical Research Awards (ICRA)

- **Targeted Depression of Fetal Hemoglobin in Sickle Cell Disease**
  James E. Bradner, M.D.
  Dana-Farber Cancer Institute

- **Genomic and Functional Analyses of Erythrocyte Hydration Pathways as Modifiers in Sickle Cell Disease**
  Patrick G. Gallagher, M.D., and Vincent P. Schulz, Ph.D.
  Yale University

- **Translating Genetic Discoveries to Improve Sickle Cell Disease Prognosis and Treatment**
  Joel N. Hirschhorn, M.D., Ph.D., and Guillaume Lettre, Ph.D.
  Broad Institute and Université de Montréal, Montreal Heart Institute

2013 Doris Duke Foundation
Innovative Clinical Research Awards (ICRA)

- **Genome Editing of the GWAS-Marked BCL11A Enhancer: An Approach to HbF Reactivation in Sickle Cell Disease**
  Daniel E. Bauer, M.D., Ph.D. and Stuart H Orkin, M.D.
  Children’s Hospital, Boston and Harvard Medical School

- **Examination of Human Samples with Somatic Mutations in Hematopoietic Stem Cells to Inform the Biology of Fetal Hemoglobin Induction**
  Benjamin L. Ebert, M.D., Ph.D. and Maureen M. Okam, M.D., M.P.H.
  Brigham and Women's Hospital and Harvard Medical School

- **"SCD Biochip": Towards a Simple and Reliable Way to Monitor Sickle Cell Disease**
  Umut A. Gurkan, Ph.D. and Jane A. Little, M.D.
  Case Western Reserve University

- **Feasibility and Efficacy of a Home-Based, Computerized Cognitive Training Program in Pediatric Sickle Cell Disease**
  Steven J. Hardy, Ph.D. and Kristina K. Hardy, Ph.D.
  Children’s National Medical Center

- **Novel Use Of Hydroxyurea in an African Region with Malaria**
  Chandy C. John, M.D.
  University of Minnesota

- **The Effects of Hypoxia on Red Blood Cell-Dependent Thrombin Generation in Sickle Cell Disease**
  Nigel S. Key, MB ChB and Kenneth Mann, M.D.
  University of North Carolina at Chapel Hill and University of Vermont
2013 Doris Duke Foundation
Innovative Clinical Research Awards (ICRA)

- Gene Therapy for Sickle Cell Anemia
  Punam Malik, M.D.
  Cincinnati Children's Hospital Medical Center

- Targeting Neutrophil Extracellular Traps in Sickle Cell Disease
  Leslie V. Parise, Ph.D. and Bruce A. Sullenger, Ph.D.
  University of North Carolina at Chapel Hill and Duke University Medical Center

- Accurate and Inexpensive Point-of-Care Diagnosis of Sickle Cell Anemia
  Rebecca R. Richards-Kortum, Ph.D.
  William Marsh Rice University

- Risk Stratification for Clinical Severity of Sickle Cell Disease in Nigeria and
  Assessment of Efficacy and Safety during Treatment with Hydroxyurea
  Bamidele Tayo, Ph.D. and Victor R. Gordeuk, M.D.
  Loyola University of Chicago and University of Illinois at Chicago

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

- HHMI Summer Medical Fellows Program
  - Russell Bonneville, M3
  - Mentor: Richard P. Lifton, MD, PhD
  - Current Research: Identifying Common Disease Pathways via Human Genetics
  - Dr. Lifton uses genetic approaches to identify the genes and pathways that contribute to common human diseases, including cardiovascular, renal, and bone disease.

*Summer Medical Fellows spend eight to 10 weeks doing full-time research with an HHMI investigator, early career scientist, HHMI professor, or Janelia researcher. Fellows are exposed to high-quality science, have a chance to increase their scientific knowledge and research skills, and interact with world-class investigators in a rich training environment. Fellows can gain insight into a career as a medical scientist and determine if they would like to continue their research training in a year-long program.

http://www.hhmi.org/programs/medical-research-fellows-program
OSU Medical Students Experiences

- NIH MRSP (Medical Research Scholars Program) for 2015-2016
- Janini Singaravelu, M3
- 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 2015.

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

FACULTY

- K08-basic science
- K23-clinical science

T32 training grants for clinician scientists
F32 postdoctoral award
Specialty Specific Foundation Awards

Residency

Fellowship
Questions & Commentary
RESEARCH RESIDENCY
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.
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).
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)
Mr. Christopher Alvarez-Breckenridge

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.
Jillian Liu
2014 – 2015 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 not fit the requirements of Full Membership or Emeritus Membership:
  - $25 annually, $12 for premedical undergraduate students.

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/
Annual AMA Research Symposium

When & Where: Nov. 12-14, 2015, Atlanta, Georgia

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 Friday, Nov. 13, 2015.

Deadlines: Abstracts for the 2014 AMA Research Symposium will be accepted beginning in June 2015 and Due August 19

http://www.ama-assn.org
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

- MDSR Newsletter
  - 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 the work 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
The Office of Research Education’s Medical Student Research Program aims to connect interested Medical Students to basic, clinical, and translational research, mentors, and funding opportunities.

- Resources for Medical Students
- Resources for Research Mentors

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

*EBIR in LSI*
August 26$^{th}$, 2015
9:30 – 10:30
160 Meiling

*Medical Student Research Opportunities*
September 10$^{th}$, 2015
12:00 - 1:30 pm
160 Meiling

*Medical Student Research Opportunities Fair*
Monday October 19$^{th}$, 2015
5:00 - 6:30 pm
115 Biomedical Research Tower
Questions