The Johns Hopkins University
School of Medicine

45th Annual
Young Investigators' Day

Thursday, April 14, 2022 • 3 to 5 p.m.
DEAR COLLEAGUE,

Young Investigators’ Day was established in 1978 to recognize young investigators who are trained at Johns Hopkins University School of Medicine and to provide them with a forum for their work. The awards are intended to recognize research undertaken by applicants while registered as students or postdoctoral fellows at the school of medicine. This year 1 PREP scholar, 12 students, 10 postdocs, and 1 clinical fellow were selected to receive Young Investigators’ Day prizes. These individuals were selected from an exceptionally strong pool of applicants by a committee of Johns Hopkins University School of Medicine faculty.

We, therefore, created this booklet to celebrate this year’s winners. Please join me in congratulating them and their advisors on their outstanding scientific accomplishments.

Sincerely,

Andrew Holland, Ph.D.
Director, Young Investigator’s Day Program
Johns Hopkins University School of Medicine
YOUNG INVESTIGATORS’ DAY

Young Investigators Day was established in 1978 to recognize student investigators in the School of Medicine and to provide them with a forum for presentation of their work.

The Michael A. Shanoff Research Award was established in 1977 in memory of Dr. Shanoff who received his M.D. and Ph.D. from the Johns Hopkins Medical Institutions in 1973.

The David Israel Macht Research Award was established in 1982 to commemorate the centenary of his birth. Dr. Macht was a 1906 School of Medicine graduate and member of the faculty of the Departments of Pharmacology and Medicine at Johns Hopkins.

The Martin and Carol Macht Research Award was established in 1993 to honor Dr. Martin B. Macht, who received his M.D. and Ph.D. from Johns Hopkins and was a trustee of the University for many years. Dr. Carol Macht received her M.A. and Ph.D. from Johns Hopkins in the History of Art and Archeology.

The Alicia Showalter Reynolds Research Award was established in 1996, in memory of Alicia Showalter Reynolds, a Ph.D. student in the Department of Pharmacology and Molecular Sciences.

The Mette Strand Research Award was established in 1998 in memory of Dr. Strand who was Professor of Pharmacology and Molecular Sciences.

The Hans Joaquim Prochaska Research Award was established in 1998 in memory of Dr. Prochaska who earned his M.D. and Ph.D. at Johns Hopkins.

The Paul Ehrlich Research Awards are given to candidates in the Ph.D., M.D. or Masters programs, and clinical or research fellows at the Johns Hopkins School of Medicine in recognition of their contributions to research.

The Nupur Dinesh Thekdi Research Award was established in 2002 in memory of Nupur Dinesh Thekdi, M.D.-Ph.D. student at Johns Hopkins.

The Bae Gyo Jung Research Award was established in 2006 by friends and family in memory of Bae Gyo Jung, who was a predoctoral student in the department of Biological Chemistry.

The David Yue Research Award was established in 2015 in memory of Dr. David Yue, who was a Professor of Biomedical Engineering and Neuroscience.

The Paul Talalay Research Award was established in 2017 to honor Dr. Paul Talalay, who was a Professor of Pharmacology and Molecular Sciences and 41 years ago started the Young Investigators’ Day Program.

The Physician Scientist Research Award was established in 2018 to recognize the outstanding research contributions by a Physician Scientist at Johns Hopkins School of Medicine. This award is supported by the Johns Hopkins School of Medicine Physician Scientist Training Program. The Johns Hopkins Medical and Surgical Association Awards for Postdoctoral Investigation were established in 1981 by the School of Medicine to recognize excellence in research by clinical or research fellows in the School of Medicine. These Awards are designated for clinical research, laboratory research with direct clinical relevance, and basic laboratory research. The Awards are as follows:

The Alfred Blalock Research Award
The A. McGehee Harvey Research Award
The Albert Lehninger Research Award
The Daniel Nathans Research Award
The Helen B. Taussig Research Award
The W. Barry Wood, Jr. Research Award

The Claude and Barbara Migeon Research Award was established to recognize outstanding basic research by graduate students and postdoctoral fellows. Dr. Claude Migeon (1923-2018) served as the director of pediatric endocrinology at the Johns Hopkins University School of Medicine from 1961 to 1994. His early focus on steroid metabolism established the norms of adrenal function in infancy and childhood. He also discovered the genetic cause of some endocrine disorders. Dr. Barbara Migeon is a professor emerita of genetic medicine and pediatrics who is known for pioneering work on the mechanisms and consequences of X-chromosome inactivation in females and its relevance to human disease, and as the founding director of the PhD program in Human Genetics. Both Drs. Migeon have been devoted mentors of many trainees throughout their careers, and with this award we honor their contributions as both scientists and mentors.

Acknowledgments: The 45th Young Investigators’ Day program is made possible by generous contributions from the Johns Hopkins Medical and Surgical Association; The Office of the Dean; friends and family of Michael Shanoff; friends and family of David, Martin, and Carol Macht; family of Hans Prochaska; friends and family of Drs. Paul and Pamela Talalay; the Department of Pharmacology and Molecular Sciences; Dr. Emanuel Libman; Dr. and Mrs. Dinesh C. Thekdi; Dr. and Mrs. John Vela; friends and family of Bae Gyo Jung; friends, family and colleagues of Dr. David Yue; and many friends and members of the Johns Hopkins School of Medicine.
3:00 p.m. WELCOME
Paul B. Rothman, M.D.
Dean, School of Medicine,
CEO, Johns Hopkins Medicine

STUDENT LECTURES
3:05 p.m. THE PAUL TALALAY RESEARCH AWARD
TCR-mimic bispecific antibodies to target the HIV-1 reservoir
Srona Sengupta, Ph.D. Candidate
Immunology Program
Department of Medicine
Sponsors: Robert Siliciano, M.D., Ph.D.; Janet Siliciano, Ph.D.; Scheherazade Sadeghi-Nasseri, Ph.D.

THE MICHAEL A. SHANOFF RESEARCH AWARD
Development of a multi-analyte blood test for the detection and localization of cancer
Joshua D. Cohen, M.D., Ph.D. Candidate
Biomedical Engineering Program
Department of Medicine; Ludwig Center
Sponsor: Bert Vogelstein, M.D.

THE MARTIN AND CAROL MACHT RESEARCH AWARD
Identification of cross-reactive T cell responses to diverse coronaviruses
Bezawit Abi Woldemeskel, Ph.D. Candidate
Cellular and Molecular Medicine Program
Department of Medicine; Department of Infectious Diseases
Sponsor: Joel Blankson, M.D., Ph.D.

THE DAVID YUE RESEARCH AWARD
A Nanoparticle Platform Mobilizes CD4+ T cells for Immunotherapy
Ariel Isser, M.D., Ph.D. Candidate
Biomedical Engineering Program
Department of Biomedical Engineering
Sponsor: Jonathan Schneck, M.D., Ph.D.

PRESENTATION OF STUDENT AWARDS
3:45 p.m. THE PAUL EHRLICH RESEARCH AWARD
Automated Atlas-Based Segmentation of Critical Anatomy in Temporal Bone CTs
Andy S. Ding, M.D. Candidate
Department of Otolaryngology
Sponsor: Francis Creighton, M.D.

THE METTE STRAND RESEARCH AWARD
Whole Genome Duplication is a Direct Consequence of ERK-Pathway Oncogene Induction
Timothy Aikin, Ph.D. Candidate
Biochemistry, Cellular, and Molecular Biology Program
Department of Molecular Biology & Genetics
Sponsor: Sergi Regot, Ph.D.

THE MICHAEL A. SHANOFF RESEARCH AWARD
Genome imaging at physiological temperature with single-nucleotide sensitivity
Yanbo Wang, Ph.D. Candidate
Molecular Biophysics Program
Department of Biophysics and Biophysical Chemistry
Sponsor: Taekjip Ha, Ph.D.

THE ALICIA SHOWALTER REYNOLDS RESEARCH AWARD
Convergent co-evolution of multiple HCV bNAb lineages with diverse VH-genes
Clinton O. Ogega, Ph.D. Candidate
Pharmacology & Molecular Sciences Program
Department of Medicine
Sponsor: Justin Bailey, M.D., Ph.D.

THE DAVID ISRAEL MACHT RESEARCH AWARD
The miR-124-AMPAR pathway connects polygenic risks with behavioral changes shared between schizophrenia and bipolar disorder
Ho Namkung, Ph.D. Candidate
Biomedical Engineering Program
Department of Psychiatry
Sponsor: Akira Sawa, M.D.

THE BAE GYO JUNG RESEARCH AWARD
Targetable cellular signaling events mediate the pathogenesis of vascular dissection and rupture
Caitlin J. Bowen, Ph.D. Candidate
Human Genetics and Molecular Biology Program
Department of Genetic Medicine
Sponsor: Harry Dietz, M.D.

THE NUPUR DINESH THEKDI RESEARCH AWARD
Quantitative 3D Imaging of the Cranial Microvascular Environment
Alexandra N. Rindone, Ph.D. Candidate
Biomedical Engineering Program
Department of Biomedical Engineering
Sponsor: Warren Grayson, Ph.D.
THE HANS J. PROCHASKA
RESEARCH AWARD
FtsZ Treadmilling Dynamics Drives the Spatial Organization of Septal Cell Wall Synthases
Joshua McCausland, M.D., Ph.D. Candidate
Biochemistry, Cellular, and Molecular Biology Program
Department of Biophysics and Biophysical Chemistry
Sponsor: Jie Xiao, Ph.D.

THE POSTBACCALAUREATE
RESEARCH AWARD
NUDIX enzymes are inhibited by alkylaminobisphosphonates that are GPP analogues
Kim L. Phan, Postbaccalaureate
Doctoral Diversity Program
Department of Biophysics and Biophysical Chemistry
Sponsor: Sandra Gabelli, Ph.D.

POSTDOCTORAL LECTURES
4:00 p.m. THE HELEN B. TAUSSIG
RESEARCH AWARD
Btbd11 Supports Cell-Type-Specific Synaptic Function
Alexei Bygrave, Ph.D., Postdoctoral Fellow
Department of Neuroscience
Sponsor: Richard Huganir, Ph.D.

THE DANIEL NATHANS
RESEARCH AWARD
Triple negative breast cancer metastasis involves complex EMT dynamics and requires vimentin.
Eloise M. Grasset, Ph.D., Postdoctoral Fellow
Department of Cell Biology
Sponsor: Andrew Ewald, Ph.D.

THE PAUL EHRLICH
RESEARCH AWARDS
Understanding the paradoxical nature of calcium signaling in breast cancer
Monish Ram Makena, Ph.D., Postdoctoral Fellow
Department of Physiology
Sponsor: Rajini Rao, Ph.D.
A Specialized Osteoblast Metabolic Pathway Deposits Citrate into Hydroxyapatite to Impact Bone Strength
Naomi Dirckx, Ph.D., Postdoctoral Fellow
Department of Orthopaedic Surgery
Sponsor: Thomas Clemens, Ph.D.

THE A. MCGEHEE HARVEY
RESEARCH AWARD
Imaging immediate early gene NPTX2 at synapses in vivo during critical period plasticity and behavior relevant to schizophrenia
Seung-Eon Roh, Ph.D., Postdoctoral Fellow
Department of Neuroscience
Sponsor: Paul Worley, M.D.

THE ALFRED BLALOCK
RESEARCH AWARD
Cardiolipin bound to mitochondrial ADP/ATP carrier supports the structure and transport-related function
Nanami Senoo, Ph.D., Postdoctoral Fellow
Department of Physiology
Sponsor: Steven Claypool, Ph.D.

THE ALBERT LEHNINGER
RESEARCH AWARD
Single-cell transcriptomic map of the mouse iris
Jie Wang, Ph.D., Postdoctoral Fellow
Department of Neurobiology
Sponsor: Jeremy Nathans, M.D., Ph.D.

THE PHYSICIAN SCIENTIST
RESEARCH AWARD
Investigation of cfDNA fragmentation for non-invasive cancer diagnosis and disease monitoring
Dimitrios Mathios, M.D., Clinical Fellow
Departments of Medicine and Cancer Genomic
Sponsors: Victor Velculescu, M.D., Ph.D.

THE CLAUDE & BARBARA MIGEON POSTDOC
RESEARCH AWARD
Mechanical tension mobilizes Lgr6+ epidermal stem cells to drive skin growth
Yingchao Xue, Ph.D., Postdoctoral Fellow
Department of Dermatology
Sponsor: Luis Garza, M.D., Ph.D.

PRESENTATION OF THE
POSTDOCTORAL AWARDS
4:25 P.M. THE W. BARRY WOOD, JR.
RESEARCH AWARD
Coordinated activity between astrocyte and neurons during auditory development
Vered Kellner, Ph.D., Postdoctoral Fellow
Department of Neuroscience
Sponsor: Dwight Bergles, Ph.D.
Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?

Despite decades of molecular study, many of the earliest events in the development of human cancers remain unexplored. For example, nearly a third of human tumors undergo whole genome duplication [WGD] that can increase cancer cell fitness, but it is not known how or when these tetraploid cancers arise. This is because cancer onset, or oncogenesis, is unpredictable and may occur in just one or a few cells in an otherwise healthy tissue. In the Regot lab, we use live imaging of biosensors to dissect the signaling events that underlie these rare events. This approach allowed me to observe the effects of cancer mutations on cell signaling and the cell cycle. I found that oncogenic WGD results from inappropriate inactivation of cell cycle machinery and mitosis skipping. These skipped cells are primed for reentry into the cell cycle, despite having double the normal DNA content. I found that the same common mutations are associated with WGD in human lung adenocarcinomas and demonstrated that these oncogenes can cause WGD in primary human airway cells. These findings revealed the mechanism and timing of a key event in oncogenesis, whole genome duplication, which is a turning point in the development of aggressive cancers.

Q2: Why did you choose Johns Hopkins for your work?

When deciding on graduate schools, I was looking for an institution with excellent quality of research and a strong intellectual community. I was impressed by the openness of faculty to embracing new ideas and supporting student success. In addition, the students that I met through Johns Hopkins are creative and motivated, and many have become close friends.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?

I have looked up to many previous winners of the Young Investigators’ awards as exceptional researchers, fantastic mentors and inspiring colleagues. Because of my interactions with previous awardees, I have always respected the awards and the achievements that they represent. I’m honored to be included in the company of fellow Mette Strand awardees, and I will take motivation from Dr. Strand to continue to apply the tools of molecular biology to the understanding of human disease.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)

My projects in the Regot lab involved applying new technologies to observe fundamental processes in cancer development. With these new tools, we observed surprising events and behaviors that required rethinking the path healthy cells take to become cancers. It was deeply satisfying to work out the mechanistic details and think about the consequences of these events. That work required Sergi [Regot] and I to embrace uncertainty and take an adaptive approach to designing experiments in which we were constantly testing new ideas. Throughout this process, Sergi has been an incredibly supportive and creative mentor, and has helped me to grow into a skilled, independent scientist. I was also constantly encouraged by my lab mates and guided by the community of talented scientists in the MBG [molecular biology and genetics] department and BCMB [biochemistry, cellular and molecular biology] graduate program.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?

The Hopkins research community is exceptionally supportive of trainees, and I’ve always felt that my ideas and questions are taken seriously by anyone from grad students and postdocs to faculty. It’s a pleasure to do research in a place where the contributions of students are recognized and celebrated by Young Investigators’ Day.
Q6: What has been your best/most memorable experience while at Hopkins?
There have been many mornings when I rushed into the lab to check the results of my imaging experiment from the night before. A few of these events stand out to me because of the thrill of executing a well-planned experiment and getting a clear result that changed the course of my projects. These will always be some of my favorite moments from my time in the Regot lab.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I'm looking forward to graduating and finding the next interesting problem to work on!

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
My friends laugh at me for having too many hobbies. In graduate school alone, I've filled a bookshelf reading and a sketchbook painting, I've packed my deck gardening, returned to gaming and camped through the summers. I've also become a motorcyclist, a fly fisherman and a, (passable) chef.

Caitlin J. Bowen
Bae Gyo Jung Research Award

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
In Hal Dietz’s laboratory, I focused my doctoral research on vascular Ehlers-Danlos syndrome [vEDS] — a rare genetic disorder due to collagen type III mutations that leads to spontaneous vascular rupture and dissection. It is widely believed that the often fatal vascular rupture occurs because of weak tissue in the vessel wall, due to reduced amounts of collagen. However, by uncovering genetic and environmental modifiers of disease, we discovered that signaling abnormalities in the endothelin signaling pathway [ET1/PLC/PKC/ERK] drive vascular rupture risk. Pharmacologic agents that inhibit this pathway prevent death from vascular rupture. These discoveries illustrate the power of complementary discovery-based methods to elucidate the molecular basis of disease, reveal novel understandings of vascular biology and discover new therapies for catastrophic vascular disease. Based on these results, the first clinical trial for patients with vEDS was initiated in 2021 using a novel PKCβ inhibitor, enzastaurin.

Q2: Why did you choose Johns Hopkins for your work?
I chose Johns Hopkins because of their dedication to physician-scientist training. I was drawn to the institution because of their incredible clinical and research prowess. I also was drawn to the collegiality, curiosity and kindness offered by current students and staff.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
I have been inspired by many previous students who have won Young Investigators’ Day awards. It is such an honor to be awarded among the other successful and talented young investigators.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
My research was motivated by my thesis adviser, Dr. Hal Dietz, as well as patients with vascular Ehlers-Danlos syndrome. I have had the pleasure and privilege to work closely with people with vEDS, both in the lab and at meetings around the world. They taught me about their disease, guiding my research questions, and I shared with them our advances in the laboratory. Dr. Dietz also taught us to design experiments that considered both scientific data and clinical questions, so many of our discoveries were translated directly to patient care. Dr. Dietz also taught me how to appreciate paradoxes in scientific data and to be excited when hypotheses were proved wrong, because that meant there was something to be learned.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
I look forward to Young Investigators’ Day each year and the students’ and fellows’ research accomplishments. Research can be quite challenging, and it is important to celebrate the quality and significance of the work conducted by
trainees. I have been inspired by many previous students who have won Young Investigators' Day awards.

Q6: What has been your best/most memorable experience while at Hopkins?
One of my best experiences at Hopkins was attending a joint research meeting and patient conference for those with vascular Ehlers-Danlos syndrome. Studying a human disease and sharing your research findings directly with patients and their families provides immeasurable insight and perspective, and helps drive innovative basic and translational science questions. I have felt incredibly lucky to be able to train as an M.D.-Ph.D. at Hopkins, where every day I get to go to work and do something I love while helping contribute to expanding the boundaries of science and medicine.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I am excited to continue my training as a pediatric resident at the Boston Children’s Hospital and Boston Medical Center as part of the Boston Combined Residency Program. Pediatrics training will allow me to learn how to care for children with complicated conditions, ascertain clinically relevant research questions, and provide the foundation to translate my findings into new and effective therapies for children. I am committed to translational research and aspire to have seamless continuity between my clinic and basic science laboratory. I am specifically interested in becoming a pediatric physician-scientist who sees children with genetic cardiovascular conditions.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
In my free time, I like reading science fiction, watching British murder mysteries and quilting. I’ve made 23 quilts during my time at Hopkins and I also sewed with B-more Bags, a social enterprise that raises money for House of Ruth Maryland. On weekends, I am either backpacking in a national park or cycling the Baltimore & Annapolis Trail. At home, I hang out with my two rescued cats, Sage and Clover. Alexei Bygrave, Ph.D.

Helen B. Taussig Research Award

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
Over the last 20–30 years, the field has gained a detailed understanding of the molecular composition of glutamatergic synapses, the site of excitatory neurotransmission in the central nervous system. To date, however, we know very little about cell type-specific differences in the molecular basis of glutamatergic synapse function. I’ve been working in Richard Huganir’s laboratory in the Department of Neuroscience, where my research has focused on uncovering molecular specializations at glutamatergic synapses received by inhibitory interneurons — minority cell types in cortical and hippocampal circuits. We believe this research is important as it could lay the foundations for new cell type-specific interventions to regulate the activity of subsets of glutamatergic synapses.

Q2: Why did you choose Johns Hopkins for your work?
As an undergraduate student in the U.K., I remember reading papers from the Huganir lab at Johns Hopkins — our competitors at the time! — so the lab had been on my radar for about a decade. More generally, I was really excited about joining the Department of Neuroscience at Johns Hopkins because of its excellent reputation for molecular neuroscience research and because I’d heard great things about the collaborative environment.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
It’s a real honor to receive this award. While not directly linked to my work, Dr. Taussig’s research reminds me of the clinical relevance of scientific discoveries, and the positive impact of biomedical research. This award has given me a big confidence boost, which means a lot professionally as I’m nearing the end of my postdoctoral training and preparing to transition into an independent research position.
Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
I think collaboration is at the core of this project’s success. I’ve benefitted from support from my direct mentor, but also from other internal and external collaborations. In addition, I would have been lost without the help and support of the research assistants, students and postdocs within the lab.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
I think that the event is incredibly valuable and helps to motivate trainees at different stages of their careers. Students and fellows sculpt the atmosphere and creativity of our different departments enormously, and I think recognition of this is important.

Q6: What has been your best/most memorable experience while at Hopkins?
My most memorable experience has been meeting and collaborating with clever and kind people, who have become great friends over the years.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
In the next year, I’ll be transitioning into an independent faculty position, continuing to explore the molecular basis of cell type-specific glutamatergic synapse function.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
I’m a super keen carp fisherman, which is much more popular in the U.K. (where I’m from) compared to here in the US — where carp are considered unworthy of targeting! There’s some superb carp fishing all around Maryland, and I’ve spent many an early morning trying to catch them in Baltimore’s local reservoirs. I’ve even managed to get some lab mates interested in fishing, which I’m considering a professional milestone.

Joshua D. Cohen
Michael A. Shanoff Research Award

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
Many cancers can be cured by surgery and systemic therapies when detected while they are still localized, yet most cancer types lack noninvasive screening modalities to identify them before they have metastasized to distant sites. Under the mentorship of Bert Vogelstein within the Ludwig Center at Johns Hopkins, my work focused on the development of a noninvasive blood-based diagnostic for the detection and localization of a variety of cancer types. This test, called CancerSEEK, assays the levels of circulating proteins and mutations in cell-free DNA. In a study applying this test to 1,005 patients with nonmetastatic, clinically detected cancers of the ovary, stomach, pancreas, esophagus, colorectum, lung or breast, CancerSEEK tests were positive in a median of 70% of the eight cancer types. Importantly, the specificity of CancerSEEK was greater than 99% when evaluated in a cohort of 812 healthy controls. Additionally, to further improve the performance of CancerSEEK, I developed a novel technological methodology that can more sensitively and specifically detect ultrarare circulating tumor DNA molecules. In summary, this work lays the conceptual and practical foundation for a single, multianalyte blood test for cancers of many types.

Q2: Why did you choose Johns Hopkins for your work?
I chose to come to Johns Hopkins for its unparalleled research opportunities coupled with the exceptionally collaborative and supportive community it fosters for its faculty and trainees. I will never forget the moment when, as a first-year medical student, I emailed 20-plus faculty members inquiring about summer research rotation opportunities — naively expecting to hear back from three or four of them — and then getting an enthusiastic response from every individual I contacted, asking to meet within a few days! To me, this perfectly encapsulates the type of unconditionally supportive training environment that Johns Hopkins provides for its students, which paired
with its research excellence and collaborative spirit, makes the institution so special.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?

It is an immense honor to be included among the list of recipients of the Michael A. Shannoff Award, many of whom I look to as scientific role models. I am particularly honored to be included in the company of some of my former M.D.-Ph.D. classmates who have previously won this award.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)

This work was highly interdisciplinary and would not have been possible without the invaluable support of our international team of oncologists, molecular biologists, geneticists, computational biologists and mathematicians. Integrating the expertise from these fields was vital to the project’s success, and I am particularly grateful for all of the support and guidance I received from our team members. In particular, I owe a great deal of appreciation to my graduate mentor, Bert Vogelstein, as well as Ken Kinzler and Nickolas Papadopoulos, for the guidance and mentorship they have provided while in the lab. And finally, I am exceptionally fortunate to have come from a family who has unconditionally supported me throughout this journey — I would not be the scientist I am today without them.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?

I recall attending Young Investigators’ Day as a first-year student and being awestruck by the incredible scientific discoveries that were being made by my senior peers at Hopkins. Some of those senior graduate students inspired me to pursue my ultimate research project and served as invaluable mentors to me. The fact that the school of medicine has this program specifically dedicated to recognizing research contributions made by trainees is emblematic of the value it places on its students and the collegial environment it fosters. It’s a great honor to be part of this tradition.

Q6: What has been your best/most memorable experience while at Hopkins?

Some of my fondest memories from my time in the lab are of impromptu late night brainstorming or troubleshooting sessions, often over takeout, with my lab mates, many of whom I’m fortunate to also call close friends. It’s unequivocal that these contributed to the success of my research and my development as a scientist. I was fortunate to be part of a highly collegial lab, and this environment not only fostered a productive environment but also one in which conducting research was immensely fun.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?

After completing my graduate work, I’m currently finishing the third and fourth year of medical school. Long term, I hope to one day lead a team dedicated to translating scientific discoveries to the benefit of patient care.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?

I enjoy road cycling and am lucky to have my older brother, coincidentally also a Johns Hopkins graduate, in the area. We go on rides together out in Baltimore County to enjoy the well-paved and low-traffic roads, countryside scenery and occasional ice cream shop!

Andy S. Ding
Paul Ehrlich Research Award

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?

The temporal bone houses an incredible amount of tiny, geometrically complex anatomical structures that are important for hearing and balance. Surgical access in this region requires drilling through varying densities of bone and identifying surgical landmarks to avoid damaging hidden critical anatomy. Due to these inherent limitations in visibility and maneuverability,
temporal bone surgery poses a risk for accidental damage to surrounding anatomy, which can cause hearing loss, vertigo, altered taste sensation and facial paralysis.

One possible approach for mitigating accidental damage to surrounding structures is using intraoperative image-guided robotic systems that can determine the location of robotically controlled instruments relative to patient imaging and enforce safety barriers around contacting critical anatomy. A key obstacle to utilizing the full potential of these technologies is the lack of streamlined methods for labeling critical anatomy on patient CT imaging. While manually segmenting surgically relevant landmarks on preoperative imaging can be performed, it is extremely time intensive and prone to inter-reader variability. To overcome these limitations, I have developed an efficient, accurate and automated pipeline for segmenting structures in temporal bone CT scans under the guidance of Dr. Francis Creighton and Dr. Russell Taylor in the Laboratory for Computational Sensing + Robotics. This automated pipeline has the potential to provide robust anatomical information for developing immersive virtual surgical simulators, patient-specific anatomical models, population-based shape analyses of the temporal bone and improved guidance for surgical navigation systems.

Q2: Why did you choose Johns Hopkins for your work?
I chose to attend the Johns Hopkins University School of Medicine because of its long history of training future leaders in medicine and surgery. With world leaders in robotics and machine learning, Johns Hopkins has provided myriad opportunities for me to pursue my own research interests in surgical innovation.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
It is an incredible privilege to receive this award in honor of Paul Ehrlich, a Nobel laureate and biomedical pioneer who developed the frameworks for modern chemotherapy and diagnostic staining techniques. Dr. Ehrlich has left behind a massive legacy that has influenced the field of medicine for generations. This award inspires me to continue forging my academic journey and building my own legacy in computer-aided surgery. Learning about the achievements of past award recipients, I am humbled to be in the company of great scientific minds.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
I am immensely grateful for the guidance that I have received from my mentors in the lab. Dr. Francis Creighton has been a beacon of support both personally and professionally, providing key advice for success during residency and beyond. Dr. Russell Taylor, often regarded as the “father of medical robotics” for his work on robotic orthopaedic surgery, has shown me time after time the value of maintaining curiosity and passion in research. In addition to these wonderful mentors, I have been fortunate to work with incredible graduate students, medical students and postdoctoral fellows — Alex Lu, Max Li, Adnan Munawar, Justin Kim and Nimesh Nagururu, among others — along the way.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
Behind successful and influential research are often students and fellows keeping the ship afloat. Although rewarding and exciting, research requires consistent dedication and protection from burnout. When experiments or projects go awry, it can be difficult to maintain motivation to push forward. I am delighted that Young Investigators’ Day recognizes and appreciates the hard work of trainees who contribute to groundbreaking research at Johns Hopkins.

Q6: What has been your best/most memorable experience while at Hopkins?
One of my most memorable experiences at Hopkins was when my teammate Alex Lu and I successfully implemented our segmentation pipeline. After months of coding, debugging and troubleshooting, we had finally reached a point where we could present promising results to our lab. From this singular project, we have been spawned a variety of clinically relevant research endeavors that push the boundaries of computer-aided surgery. I cannot emphasize enough the value of Alex Lu’s contributions to push this project forward.
Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
After graduation, I will be continuing my training at Johns Hopkins as an otolaryngology–head and neck surgery resident, with plans to pursue a fellowship in neurotology.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
Over the past several years, I have developed a deep appreciation for sake, a Japanese beverage made by fermenting polished rice. Eager to learn more about sake, I recently brewed and bottled my own sake and enjoyed it with family and friends.

Naomi Dirckx, Ph.D.
Paul Ehrlich Research Award

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
My research focuses on the mechanisms and impact of citrate delivery to the skeleton. The Clemens lab focuses on understanding the processes of osteoblast bioenergetics and how this is involved in the formation of bone. By reading old research papers [from the 1940s], my mentor discovered that 80% of our total body citrate is stored in the skeleton. However, nobody knew how it got there and which role it played. We now discovered that osteogenic expression of the citrate transporter SLC13A5 plays a significant role in citrate partitioning into bone. A malfunctioning transporter significantly impacts bone mass and strength, and causes hypomineralization of teeth in both mice and humans. Understanding that osteoblast bioenergetics is not only important for the generation of energy but also for providing critical metabolites, such as citrate, to facilitate bone mineral formation is a new concept to the field. This finding is immediately relevant to developing better strategies for not only improving bone mass but also bone quality in metabolic diseases such as osteoporosis and diabetes or in rare diseases (e.g., SLC13A5 disease).

Q2: Why did you choose Johns Hopkins for your work?
I met my mentor, Dr. Clemens, when I was still a master’s student. I remember how scared I was to present my work to him, a well-known Hopkins professor, as a young and unexperienced student! However, after that we stayed in touch, and when I finished my Ph.D. in Belgium. I was ready for an adventure abroad and joined his lab as a postdoc.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
After two very difficult years of pandemic, far away from family and without many opportunities to share my work and get recognition for it, receiving the Paul Ehrlich Award meant a lot to me. Paul Ehrlich did ground-breaking work in cancer research and immunity, and was awarded the Nobel Prize in Physiology or Medicine. Being extremely honored and humbled to receive this award, I hope it will also help me in kick-starting my career as an independent investigator to make significant contributions to the bone field.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
I think this was the most challenging project I have ever worked on. Since this SLC13A5 research in bone was fairly new, it was hard to find good mouse models, kits, antibodies, methodologies, etc. However, I could benefit a lot from my mentor’s large network and the amazing research labs within Hopkins to find the right collaborations to successfully execute this project. Also collaborating with the TESS Research Foundation, a patient advocacy organization for SLC13A5 disease, gave me so many opportunities, contact with other researchers, industry and patients, and the ability to do research on human samples with mutations in SLC13A5.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
I think it is a great initiative to give recognition to students and postdocs who are often the driving engines in the advancement of scientific research. Receiving this award gives us more confidence in what we do and helps us in taking the next steps in our scientific careers. For the day itself, I can’t wait to
meet the other awardees and learn about their ground-breaking research and future plans!

**Q6: What has been your best/most memorable experience while at Hopkins?**
On the personal side, I met the man of my life here! Despite living only an hour away from each other in Europe, it seems like we both had to come to Hopkins to meet each other!

On the professional side, doing research among the best scientists in the world and being awarded with a K99/R00 career development grant last month made me feel extremely fortunate, grateful and excited for the future!

**Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?**
I’d love to have my paper published in the next months, and then I will start my quest for faculty positions, as my heart lies in academia.

**Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?**
I grew up in a small farmers village in Belgium, where I loved to spend time training horses. As I loved that way of living, I didn’t mind spending three hours in the car each day to get to the lab. Since I moved to Baltimore, I became a real city girl that loves working out in the gym, dancing and going out for dinner. I also adopted a very fluffy and adorable cat, Hoover, within the first month of moving to Baltimore. I think he is now the most famous cat of Hopkins!

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**Eloïse M. Grasset, Ph.D.**
*Daniel Nathans Research Award*

**Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?**
One research interest of the Ewald lab is to understand how cancer cells are able to travel within the body to form distant metastasis. For my research, I focused on triple negative breast cancer (TNBC), an aggressive subtype of breast cancer typically associated with metastasis and worse patient outcomes. Patients with TNBC tumors express mesenchymal markers often associated with the epithelial to mesenchymal transition (EMT). However, the role of EMT during spontaneous TNBC metastasis in vivo remains incompletely understood, and the clinical relevance of EMT in patients with TNBC is unclear. Using a combination of in vivo and ex vivo organoid assays, I demonstrated that EMT is required for TNBC metastasis formation. Importantly, my research highlighted the complexity of cancer cells’ states within TNBC metastases and revealed that the majority of TNBC metastases maintain some mesenchymal features. These results suggest that TNBC will be an important context in which to evaluate anti-EMT therapeutic strategies. Indeed, targeting cancer cells expressing mesenchymal markers would potentially inhibit both invasion and metastases development.

**Q2: Why did you choose Johns Hopkins for your work?**
Even though Johns Hopkins is a world-renowned research institute, my decision was based on Dr. Andrew Ewald’s research. I remembered presenting journal clubs on his publications during my Ph.D. training. Therefore, I was excited to apply to his lab when I was looking for a postdoc. It is only after a couple of months at Johns Hopkins that I realized how lucky I am to be able to study in such a great environment.
Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
I am very honored and humbled to receive the Daniel Nathans Research Award. Personally, this award gives me the confidence to continue tackling the challenging problems in cancer biology. Research can sometimes be difficult for trainees, with the fear to fail or not be good enough in this very competitive domain. This award is a recognition of all the perseverance and hard work that was needed to accomplish this project. Interestingly, my project would not be possible without Dr. Daniel Nathans’ work on the SV40 virus. I used a mouse model, for my research, that developed breast cancer due to the expression of the large T antigen of the SV40 virus, discovered by Daniel Nathans using restriction enzymes.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
I have been incredibly fortunate to have Dr. Ewald as an adviser. He has given me the intellectual freedom to pursue the questions and ideas that I find most interesting and, most importantly, he has always been supportive. Moreover, research is a teamwork. I don’t think this project would have been possible without the numerous discussions with the current and past Ewald lab members. I would also like to thank our great collaborators at Hopkins: Dr. Elana Fertig and her lab members for their work and help on the single cell RNA sequencing. Finally, this project would not be a success without the unconditional support from my husband, Simon, and my family.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
Although research is fascinating, it is also often related to doubts and fear about our future. Most students and postdocs persevere through failed experiments and long hours. Celebrating students and fellows is important to recognize all the work the trainees are doing every day. Research would not be possible without students and fellows, and it is great that Hopkins has created a venue to recognize their achievements.

Q6: What has been your best/most memorable experience while at Hopkins?
I have had an amazing time in the Ewald lab and at Johns Hopkins. It is hard to pick just one moment. Overall, I think it’s been the fantastic scientific and nonscientific discussions with the Ewald lab members and trainees at Hopkins. I learned so much about science but also diversity and inclusion. Hopkins is a great place that brings together people from different origins and countries. I feel that we sometimes traveled during our lunch break with our discussions. This international environment is for me one of the best experiences while at Hopkins.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
Next year, I am excited to join the Center for Research in Cancerology and Immunology Nantes-Angers in France to start my research group.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
I come from a large family — I have one brother and four sisters. Interestingly, we all have completely different careers, and I am the only one in science. I love that science allows me to combine both my passion for research and traveling. So far, my research studies led me to live in the U.K., Madagascar and the U.S., which all have been incredible experiences, both professionally and personally.
Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?

Decades of research in cellular therapies for cancer have focused on modulation of cytotoxic — CD8⁺ — T cells, the immune system’s professional killers. In the Schneck lab, we have sought to advance these cell therapies to the clinic through development of acellular platforms that promote CD8⁺ T cell antitumor activity. That said, a recent appreciation for the pivotal role that helper — CD4⁺ — T cells play in therapeutic cancer immune responses has motivated us to generate nanoparticle technologies targeting both effector and helper functions of CD4⁺ T cells. In our recent work, we showed that our nanoparticles can expand rare antigen-specific murine and human CD4⁺ T cells. Intriguingly, unlike with other traditional stimulation platforms, CD4⁺ T cells activated with these nanoparticles demonstrate cytotoxic activity, a phenotype that has been observed almost exclusively in vivo, allowing us to probe the etiology of this uncommon but clinically relevant cell subset. Additionally, using a nanomaterial approach to spatially control the proximity of CD4⁺ and CD8⁺ T cells during activation, we demonstrated that help signals from CD4⁺ T cells could be relayed to CD8⁺ T cells, in turn enhancing CD8⁺ T cell memory formation, function, cytotoxicity and antitumor activity. These findings illustrate several ways in which CD4⁺ targeted nanotechnologies can bolster current approaches to cancer immunotherapy.

Q2: Why did you choose Johns Hopkins for your work?

I was excited about working in an environment that nurtures both scientific rigor and clinical translation. During my visit, I was also struck by the eagerness of professors and students alike to share their work and their ideas. Indeed, I feel privileged to have trained in such a highly collaborative, unselfish environment at Hopkins.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?

I am honored to be the recipient of such a prestigious award and to be recognized within the same forum where so many of my scientific role models are currently or were previously recognized. I am humbled to see this project recognized, especially given the many obstacles and sources of doubt that have challenged it from inception. I feel a special, close connection with the David Yue Research Award. Although I never had the privilege to meet Dr. Yue, since hearing about his legacy during my first visit to Hopkins, I have felt drawn to his infectious, child-like fascination for science and have turned to his quote about the privilege of scientific discovery time and time again as a wellspring of inspiration when encountering failures in lab. I hope to honor Dr. Yue’s life and legacy throughout my career in biomedical research.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)

Nothing contributed more to my project’s success than Dr. Schneck, who took a chance on me, allowing me to pursue a risky project outside of the lab’s traditional focus and connecting me to all of the right collaborators and resources to make it happen. I am also indebted to all of my collaborators, especially in Dr. Jamie Spangler’s and Sharon Gerecht’s labs, for the support and faith they showed in the project and in me. This project would certainly not have happened if not for their time, effort, expertise, materials and ideas. Lastly, this project’s success was due to support from the NIH [National Institutes of Health] Tetramer Core Facility, my mentees and my wife.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?

Young Investigators’ Day is a fantastic way to celebrate the scientific contributions of Hopkins trainees. As someone who has spent most of his graduate career looking up to previous YIDP honorees, I can personally attest to how inspirational and motivating this ceremony is!

Q6: What has been your best/most memorable experience while at Hopkins?

My most memorable experience at Hopkins was attending Gregg Semenza’s press conference at Hopkins after he won the Nobel Prize in Physiology. Not
only was it moving to be at such a historic moment for the university, but I was particularly inspired by all of the Hopkins pride Dr. Semenza exuded and that was palpable throughout the auditorium during his speech. It made me feel incredibly privileged to have had the opportunity to study here.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I plan to graduate in May, and I am currently applying to immuno-oncology R&D positions.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
I am one of four boys and I have five nephews (no nieces). Also, my wife and I are both left-handed. Naturally, our families are curious whether our children are all going to be left-handed males. Additionally, I am somewhat versed in the obscure art of cantorial music.

Vered Kellner, Ph.D.
W. Barry Wood Jr. Research Award

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
During development, the brain generates activity spontaneously, without any stimulus from the outside world. This activity trains the brain to be ready for sensory input and is important for the maturation of brain circuits. My research in the Bergles lab has uncovered the involvement of astrocytes, a glial cell type in the brain, which were often thought to be merely supporting cells. Using advanced imaging and molecular techniques, I have found that astrocytes and neurons coordinate spontaneous activity during early development of the auditory system, and that this activity likely mediates the maturation of both cell types. These results position astrocytes as potential therapeutic targets for disorders that involve the maturation of brain circuits, such as autism spectrum disorders and schizophrenia.

Q2: Why did you choose Johns Hopkins for your work?
I chose Johns Hopkins because I was very interested in the superb research coming from the Bergles lab. I also heard great things about Johns Hopkins’ reputation as a top-notch university for research while still maintaining a collaborative environment.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
Research is hard work and it often goes unrecognized, so getting this award made me feel very excited and honored. Upon reading the biography of W. Barry Wood Jr., I felt truly inspired. He made so many contributions to science and also to policies within the university. I aspire to leave such a legacy as he did.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
My project has been successful thanks to the collaborative nature of science in my lab and also at Hopkins. The Center for Hearing and Balance has been a great source of information about the auditory system and a community of auditory researchers. The shared resources in our department, such as the Multiphoton Imaging Core and the Machine Shop, really make research possible and fun. Also, the guidance and support of my adviser, Dwight Bergles, has been instrumental.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
I think it is really outstanding that Hopkins recognizes the contributions of students and postdoctoral fellows through Young Investigators’ Day and gives us an opportunity to shine. I am honored to have been selected for this award.

Q6: What has been your best/most memorable experience while at Hopkins?
I had the opportunity to work with Dr. David Mintz, who is an anesthesiologist and associate professor in the Department of Anesthesiology and Critical Care Medicine here at Hopkins. These collaborations with clinicians are truly what make working at Hopkins so exciting.
Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I am currently looking for academic faculty positions and hope to open my own lab next year.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
I am originally from Israel, and as we have mandatory army service, I spent two years after high school in the Israeli army helping notify families about injured and deceased soldiers. This experience gave me a very broad perspective about the world and helped determine the path I wanted to take in my career.

Monish Ram Makena, Ph.D.
Paul Ehrlich Research Awards

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
Breast microcalcifications, indicative of Ca^{2+} dysregulation, are early signs of breast cancer. My work highlights that the therapeutic targeting of calcium signaling is not straightforward. Since both elevation and depletion of Ca^{2+} levels can drive malignant phenotypes, the specific molecular mechanisms driving these changes need to be clearly understood. This is exemplified by my work on the opposite roles of Golgi/secretory pathway Ca^{2+}-ATPase isoform SPCA2 in breast cancer subtypes. I showed that high expression of SPCA2 in receptor positive breast cancer confers poor survival prognosis and drives pro survival and chemoresistance. In triple negative breast cancer, I showed that low expression of SPCA2 confers poor survival prognosis, drives metastasis and drug resistance. Thus, the targeting of Ca^{2+} signaling in breast cancer needs to be subtype and isoform specific. Inhibitors that decrease SPCA2-driven Ca^{2+} signaling in luminal and HER2+ breast cancers and enhancers that reactivate deficient SPCA2-mediated calcium signaling in basal/TNBC could be effective therapeutic tools.

Q2: Why did you choose Johns Hopkins for your work?
First, Dr. Rajini Rao is a world-renowned expert in the intracellular ion transport field. Second, Johns Hopkins is one of the best places in the world for scientific research.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
I received the Paul Ehrlich Award. Dr. Ehrlich is a noble laureate and is regarded as the father of modern chemotherapy. It is an honor to receive recognition in his name. Professionally, it drives me to strive for excellence and personally, it is rewarding when accomplished scientists recognize the importance of my work.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
I believe success is an integration of opportunity, skill and hard work. I believe calcium is a soil in which breast cancer grows, and yet surprisingly very little has been explored in this field. Dr. Rao had been a great mentor in terms of helping me to enhance my research capabilities and being gracious about my schedule during pandemic and medical emergencies.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
I hope this day will bring back the glory and happiness of collectively celebrating science events in person.

Q6: What has been your best/most memorable experience while at Hopkins?
When I received the 2020 AACR [American Association for Cancer Research]-AstraZeneca Breast Cancer Research Fellowship — there were about 300 grant applications submitted from all over the U.S.A., my application was in the top 1% and it got funded. This boosted my confidence, and reassured the importance of my work.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I started as a medical writer at the National Institutes of Health (NIH). In the future, I want to do clinical research, which will benefit people.
Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
During graduate school at the Texas Tech University Health Sciences Center, I was one of the founding members of the Our Legacy Now Student Foundation to support students in need. I helped in fundraising about $20,000. So far, more than 25 students received financial support for special needs. I feel gratified every time I think of it.

Dimitrios Mathios, M.D.
Physician Scientist Research Award

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
I joined the cancer genomics lab led by Victor Velculescu and Rob Scharpf during my two years of research fellowship. During that time, my colleagues and I discovered and validated a new way to noninvasively diagnose patients with brain cancer and lung cancer via a blood test. This discovery is important as up until now, brain cancer could not be detected in the blood in the majority of the cases with any known methodologies. In lung cancer, we showed that detection at early stages is possible in a significant number of cases. Using our methodology, we were able to noninvasively subtype lung cancer into the two main categories: non-small cell versus small cell lung cancer.

Q2: Why did you choose Johns Hopkins for your work?
Johns Hopkins has a tradition of excellent patient care and surgical innovation and a great track record of bench to bedside discoveries that have shaped the way medicine is practiced worldwide.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
Receiving this award is humbling and a great honor for me. I am aspiring to be a surgeon-scientist, and having been recognized among the many excellent physician-scientists that do great work in their respective fields at Johns Hopkins gives me motivation to continue to think of new ways to bring fundamental biological discoveries closer to clinical practice, in parallel to the clinical and surgical duties I have toward my patients.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
I think the success of the projects I worked on during my fellowship were a result of a combination of preparation, excellent mentors and collaborators, hard work, creative thinking and some luck.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
This is a great opportunity to showcase the achievements and progress that have been made across the medical campus in many different fields in science, and it gives a greater perspective on the mission of the Johns Hopkins school of medicine as an institution of medical innovation.

Q6: What has been your best/most memorable experience while at Hopkins?
I met my wife at Hopkins while we were working in the lab. Both of my children were born at The Johns Hopkins Hospital. All my adult happy moments have revolved around Hopkins.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I will be completing my residency in a few months and will go on to do a surgical fellowship in skull base surgery at Weill Cornell. I am currently applying for faculty positions in neurosurgery.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
I grew up in a small town in Greece. My parents are olive farmers and I grew up helping them harvest olives when not in school. I moved to the U.S.A. after medical school to do translational research in cancer immunotherapy with no prior lab experience. My now wife, back then a lab technician, showed me for the first time how to use a pipette.
Joshua McCausland  
*Hans J. Prochaska Research Award*

**Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?**  
I work in the lab of Dr. Jie Xiao in the Department of Biophysics and Biophysical Chemistry. In general, we study how bacteria organize several proteins in the right time and place for successful cell division through super-resolution microscopy. My project in particular studies how a bacterial cytoskeletal protein, FtsZ, can act like a linear motor to drive the movement of cell wall synthases in the model bacterium *Escherichia coli*. This discovery is important because the proteins that synthesize bacterial cell walls are antibiotic targets, so understanding how cell wall synthases are distributed, activated and spatiotemporally regulated provides insight on potential future therapeutics.

**Q2: Why did you choose Johns Hopkins for your work?**  
I chose Johns Hopkins for the strong graduate student community that I found. Graduate school is a long and difficult journey, so having a good program and connections with other students and postdocs can help when you need guidance or simply a break from experiments.

**Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?**  
I feel incredibly lucky. I’ve seen other grad students and postdocs that I’ve looked up to win this award in the past, so it’s an honor to follow in their footsteps.

**Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)**  
I’m a tinkerer by nature, and when I had to build and optimize a new platform for single molecule tracking, it took a certain level of perseverance to tweak and optimize my setup. I think that persistence, coupled with strong mentorship and support from my PI Jie and collaborator Jian Liu, helped me bring the project to the finish line.

**Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?**  
I believe it’s critical to have something like Young Investigators’ Day. Grad students and postdocs invest a large amount of their time to bring a project or idea to fruition, so it’s nice to have a day that honors their contributions to research.

**Q6: What has been your best/most memorable experience while at Hopkins?**  
I built a tough experimental platform for my first paper that orients *E. coli* cells vertically. This setup allows you to track single cell wall proteins circumferentially around the cell. After months of hard work troubleshooting and perfecting the experiment, I remember the first day I got the experiment to work. I jumped up and down and yelled a bit. Thank goodness I was alone in the lab!

**Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?**  
I will graduate this summer (July of 2022) and will start a postdoc at Stanford in September. My goal is to become a faculty member and open my own lab someday.

**Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?**  
I enjoy nature photography and weight lifting. My undergraduate degree focused more on ecology, and I still maintain that through naturalist-style hikes (it makes me a poor hiking partner due to my slow, sauntering pace). I like to find and photograph insects and fungi in their natural habitat.
Schizophrenia [SZ] and bipolar disorder [BP] are highly heritable major psychiatric disorders that share a substantial portion of genetic risk as well as their clinical manifestations. This raises a fundamental question of whether, and how, common neurobiological pathways translate their shared polygenic risks into shared clinical manifestations. In the lab of Dr. Akira Sawa, we showed the miR-124-AMPAR pathway as a key common neurobiological mediator that connects polygenic risks with behavioral changes shared between these two psychotic disorders. We discovered upregulation of miR-124 in biopsied neuronal cells and postmortem prefrontal cortex from patients with SZ and BP. Intriguingly, the upregulation is associated with the polygenic risks shared between these two disorders. Seeking mechanistic dissection, we generated a mouse model that upregulates miR-124 in the medial prefrontal cortex, which includes brain regions homologous to subregions of the human prefrontal cortex. We demonstrated that upregulation of miR-124 increases GRIA2-lacking calcium permeable-AMPARs and perturbs AMPAR-mediated excitatory synaptic transmission, leading to deficits in the behavioral dimensions shared between SZ and BP.

Q2: Why did you choose Johns Hopkins for your work?
I was initially drawn to The Johns Hopkins University because of its incredible history of scientific and clinical excellence. Upon interacting with the spectacular faculty, staff and students in the biomedical engineering department, I was fully convinced that Hopkins was the place for me to pursue my Ph.D. training.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
I feel honored to receive this award and encouraged to pursue an academic career. It is an important recognition of the hard work of many people who contributed to the project. Admiring the pioneering spirit of Dr. David I. Macht, I am honored to be able to carry on his legacy in a small way.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
I am grateful to my mentors who supported me throughout my graduate career. My thesis adviser, Dr. Akira Sawa, gave me scientific freedom to explore my own ideas, unwavering support and scientific guidance. I also deeply appreciate other mentors including Drs. Richard Huganir, Patricia Janak and Nilanjan Chatterjee for their incredible scientific insights and support.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
I appreciate Hopkins for organizing Young Investigators’ Day. It brings a great motivation/recognition to young investigators at Hopkins and gives them the confidence to continue to tackle challenging scientific questions. It can also be the day for them to share their scientific ideas and challenges with other researchers who might not otherwise hear about their work.

Q6: What has been your best/most memorable experience while at Hopkins?
Other than many joyful experiences in the lab, my best experience at Hopkins was during my first year in the human anatomy lab, which gave me a sense of awe for the complexities of the human body. My most unforgettable experience at Hopkins was when I was mentored by Dr. David T. Yue, until he passed away. He was not only an amazing scientist but also a genuinely caring mentor.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I plan to graduate within the next few months, and then join a new lab as a postdoc to see where science takes me next.
**Q8:** Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
Fulfilling my mandatory military service on the forefront was a life-changing experience for me. It gave me clarity to distinguish the most and least important things in my life. Indeed, trivial things just fall away in the face of death, leaving only what is truly important.

**Clinton O. Ogega**

*Alicia Showalter Reynolds Research Award*

**Q1:** Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
My research focuses on elucidating memory B cell and antibody responses following hepatitis C virus [HCV] or SAR-CoV-2 infection. The COVID-19 pandemic has reaffirmed the importance of vaccines in containing spread of disease and preventing serious illness. To do so, many vaccines elicit memory B cells specific for the receptor binding domains, which in turn produce durable and potent broadly neutralizing antibodies [bNAbs] against the virus. Unlike SARS-CoV-2, we currently do not have an approved vaccine for HCV. There are approximately 71 million people, many asymptomatic, living with chronic HCV infection that can lead to liver failure and hepatocellular carcinoma. One of the reasons we don’t have a vaccine is because we have not determined the critical epitopes that a vaccine can target.

In the laboratory of Dr. Justin Bailey, we study how the adaptive immune system responds to HCV or SARS-CoV-2 infection with a focus on B cell/antibody responses and their viral targets or escape mechanisms. For my thesis work, I developed a highly specific and sensitive method that captures HCV specific B cells. For the first portion of the project, I characterized memory B cells that are associated with low antibody levels during HCV infection. I found that plasma anti-HCV antibody levels were positively correlated with frequencies of resting and activated memory B cells.

Additionally, anti-HCV antibody levels were negatively correlated with levels of the expression of FCRL5 on resting and PD-1 on activated memory B cells. For the second portion of the project, I isolated and characterized 55 cross-reactive HCV specific bNAbs from an elite HCV neutralizer who naturally cleared three infections. We discovered that HCV specific bNAbs use a wide range of antibody gene segments and they acquire similar mutations that are critical for binding to the virus, pointing to convergent co-evolution of multiple bNAb lineages. Epitope mapping and crystal structures revealed that HCV bNAbs target conserved and undescribed epitopes on the virus. These findings show which epitopes are critical for bNAbs to target on an HCV virion — important information in the development of an HCV vaccine.

**Q2:** Why did you choose Johns Hopkins for your work?
The Johns Hopkins University School of Medicine was my first choice for graduate school. I’m a Hopkins lifer, having attended the Homewood campus for my undergraduate degree. While in my bachelor’s studies, I got exposed to the research at the school of medicine and worked in a tuberculosis lab. I was impressed that Hopkins offered a wide variety of research labs that are led by experts in their fields. When I was thinking about graduate school, my goal was to do clinical infectious disease research, something I knew Hopkins was a leader in. It was for this reason that I chose the Johns Hopkins University School of Medicine to pursue my Ph.D.

**Q3:** What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
Winning the Alicia Showalter Reynolds Research Award means a lot to me, as it validates and recognizes my research efforts as a young investigator. It means even more because, just like Alicia Showalter Reynolds, I too was a graduate student in the Department of Pharmacology and Molecular Sciences. Alicia Showalter Reynolds was a Ph.D. candidate in 1996 when she was abducted and murdered, and no suspect has been found. Hence, it is an honor to receive this award named after her, as it honors her memory as a graduate student.

**Q4:** What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
I attribute my project’s success to having great mentors and collaborators. I learned how to be an effective and productive investigator under the guidance
of Justin Bailey, who is just as hard working, driven and scientifically curious as I am. The Bailey laboratory is part of the viral hepatitis center, where I had the privilege of working alongside spectacular hepatitis b virus [HBV], hepatitis c virus [HCV], HIV and SARS-CoV-2 clinical immunology experts, with a co-mentorship of Stuart Ray. Finally, I was surrounded with amazing collaborators in other Johns Hopkins Medicine departments and at Caltech [California Institute of Technology] and Vanderbilt.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
Young Investigators’ Day is a crucial part of the science training at Hopkins. It offers an avenue of recognizing the hard work that many exceptional trainees are engaged in, some who might have been overlooked for their contributions. It means even more as the winners are decided by a panel of faculty members.

Q6: What has been your best/most memorable experience while at Hopkins?
From the classes to laboratory work, I have had the privilege of being surrounded with impeccable and scientifically ambitious colleagues and faculty members who always made me feel challenged and never lacked ideas. Along this training journey, I have made lifelong friends and future collaborators. These are my most memorable memories at Hopkins.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I defended my thesis at the end of January 2022 and I just recently started work as a scientist in antigen design and selection at Moderna. I hope to keep working in infectious disease vaccine development efforts for years to come.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
I spend too much time on soccer. I have been a lifelong Manchester United fan and most of my weekends are usually spent watching them play, when they have a game. I have also spent a lot of time playing in many Volo and Charm City soccer leagues around Baltimore. Soccer and running around the promenade have been a great avenue out of science when needed.

Kim L. Phan
Postbaccalaureate Research Award

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
For the duration of the DDP [Johns Hopkins University Doctoral Diversity Program], I am conducting research full-time in Dr. Sandra Gabelli’s lab, where one of my projects involves studying NUDIX hydrolases, a superfamily of enzymes known for their ability to remove mutagenic nucleotides from the nucleotide pool. They are named after their shared ability to catalyze the hydrolysis of nucleoside diphosphate linked to a moiety X, hence the name NUDIX. Many NUDIX hydrolases have cellular roles ranging from the degradation of mRNA and processing of ADP-ribosylation to the removal of mutagenic nucleotides from the nucleotide pool. Though a highly conserved signature motif of 23 amino acids, $G_1^X[5X]E_4^X[7X]R_4^XQ_4^XV_4^XQ_4^XG_2^XU$, known as the NUDIX signature sequence, allows us to identify these enzymes, more information is necessary to classify these enzymes into families.

Previously, the NUDIX family represented by Nudl was identified to be nucleoside triphosphatases with a preference for pyrimidine deoxynucleoside triphosphates. Recent studies have shown that Nudl preferentially hydrolyzes geranyl pyrophosphate [GPP] instead of a nucleoside containing metabolite. I am characterizing an atypical NUDIX family, represented by Nudl whose preferred substrate, geranyl pyrophosphate, lacks a nucleotide in comparison to the archetypical substrate. Using the conformational changes that NUDIX enzymes undergo upon substrate binding, product release and inhibitor binding will allow me to establish the rules of recognition. The characterization of Nudl as a hydrolase of GPP, with its structural determinants of specificity and inhibition, is a step toward identifying the pathway it is involved in and establishing the rules for classifying NUDIX enzymes into families.
Q2: Why did you choose Johns Hopkins for your work?
Since my undergraduate institution did not have many biomedical research opportunities and physician-scientist mentors, I sought out programs that would advance my research skills to prepare me for physician-scientist training. Thus, I joined the Johns Hopkins University Doctoral Diversity Program [DDP] and chose Dr. Sandra Gabelli’s lab after becoming captivated by the chance to learn how therapeutics are designed. I was enamored by the idea of being able to visualize a protein and characterize how allosteric binding can drastically alter structure and function. As an aspiring physician-scientist, I want to understand the mechanisms of therapeutics, learn the process of their design, and contribute to their creation and use.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
My time in the DDP has been a pivotal moment in my academic career — I went into this post-baccalaureate research experience hoping to continue exploring the pathway of science. I remember being amazed at all the outstanding research being done at Hopkins when I first arrived here. I was excited for all the opportunities that were now available to me. Receiving this award as I wrap up my time here at Hopkins is truly meaningful to me. The award gives me a sense of accomplishment as I prepare myself for the next chapter of my life as an M.D./Ph.D. student.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
My project’s success would not be possible without the tremendous support and guidance — and amazing homemade foods and desserts — from my PI, Dr. Sandra Gabelli. I feel very lucky to have such a great mentor whose enthusiasm constantly motivates me and inspires me to continue pursuing research. I came into this program with no experience in structural biology, but with Dr. Gabelli’s mentorship, I have since become proficient in it. In the process, I have not only learned how to crystallize proteins, trace electron density maps and refine protein structures, but have also learned to present my work to different audiences. I am grateful for the opportunities to work on my writing skills through manuscripts.

I am also grateful toward all the members of the Gabelli lab, and especially, Dr. Katharine Wright, a postdoctoral fellow. They have taught me a lot and are always there for support — they have been pivotal to my successes. I am thankful to Drs. Douglas Robinson and Dr. Deidra Crews, director of the Doctoral Diversity Program, for giving me this wonderful opportunity to be here and for their encouragements (and food and coffee!) during our monthly coffee breaks.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
I think that Young Investigators’ Day is a fantastic opportunity for young trainees like myself to showcase their work to a wide audience and feel appreciated by our institution. It is exciting to see the program bringing together trainees from different levels and fields and to highlight their hard work.

Q6: What has been your best/most memorable experience while at Hopkins?
My most memorable experience while at Hopkins was the opportunity to go in person to the Brookhaven National Laboratory to collect data on my NudI crystals at the National Synchrotron Light Source II until 2:30 in the morning with my PI. I also rode a tricycle for the first time at the facilities there!

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
Starting in August, I will be continuing my journey toward becoming a physician-scientist at the Medical Scientist Training Program at the University of Wisconsin School of Medicine and Public Health.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
I am proud to be a first-generation college student and soon to be a first-generation medical/graduate student! I have also been doing judo since high school and currently possess a brown belt — ikkyu. I even continued doing judo while studying abroad in Japan during undergrad. Doing judo has given me more than just the ability to throw people twice my size. It has improved my self-confidence and taught me to never give up.
Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?

In professor Warren Grayson's lab, we created 3D maps that allowed us to see the distribution of blood vessels and stem cells throughout the mouse skull for the first time. To do this, we developed a light-sheet microscopy platform that enabled us to image the entire top portion of the skull at single-cell resolution. Using our 3D maps, we discovered that stem cells were spatially associated with specific types of blood vessels during skull bone growth and healing. These results will help inform the research and development of regenerative therapies for patients suffering from large skull bone injuries.

Q2: Why did you choose Johns Hopkins for your work?

I chose Johns Hopkins because of its friendly and collaborative research environment, and its world-class research facilities that enabled me to pursue cutting-edge, cross-disciplinary research.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?

I have always been inspired by previous awardees in the Young Investigators’ Day program. Becoming a member of this accomplished group is a great honor, and it will encourage me to continue pursuing innovative biomedical research as I begin my career.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)

This project was very challenging and required me to learn new techniques in different research areas, including cranial bone biology and 3D light-sheet imaging. However, my adviser, professor Warren Grayson, was very supportive throughout my studies, and he helped connect me with collaborators to help with various aspects of my project. Additionally, my thesis committee members — professors Mei Wan, Scot Kuo and Daniel Coutu — provided helpful guidance on various aspects on my project. I was also grateful for the opportunity to visit professor Coutu’s lab in Ottawa, Canada, to train on essential bone imaging techniques.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?

Young Investigators’ Day is a wonderful program that highlights the outstanding research by students and young investigators at Hopkins. I am very grateful to be a part of a community that celebrates the accomplishments of young researchers and provides us a platform for sharing our work!

Q6: What has been your best/most memorable experience while at Hopkins?

My most memorable experience was visiting professor Daniel Coutu’s lab at the University of Ottawa in Canada. It was wonderful meeting members of the Coutu lab, and I was able to receive training from them on specialized techniques that were essential for my project. I am very grateful for their hospitality during my visit! Additionally, it was the first time that I had been in a research environment outside of the United States, and I enjoyed learning about how biomedical research is conducted in Canada.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?

I recently graduated with my Ph.D. in biomedical engineering, and will be continuing my research at Hopkins as a postdoctoral fellow in the labs of professors Jennifer Elisseeff and Warren Grayson. My goal is obtain a faculty position in the next few years and start a lab focused on studying regenerative therapies for orthopaedic tissue repair.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?

When I was in middle school, I competed in sport stacking competitions, aka cup stacking, and was the Individual all-around world champion in 2006. I had the privilege of stacking on TV shows including Good Morning America and an ESPN special to promote the sport.
Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
Building on the observation that a protein called NPTX2 [neuronal pentraxin 2], which is related to memory consolidation, is reduced in the CSF of schizophrenia patients, I revealed that its trafficking at the synapses is impaired in schizophrenia-relevant behaviors. A separate but related discovery I made is that in vivo NPTX2 synaptic trafficking is contingent on the connectivity status of pyramidal to PV-interneuron, which gates a form of visual critical period plasticity, which is seen during development. I am doing research in Dr. Paul Worley’s lab at the department of Neuroscience.

Q2: Why did you choose Johns Hopkins for your work?
I first contacted Dr. Paul Worley for a postdoc opportunity to study memory consolidation mechanism using an in vivo approach and chose JHU. But later I found that the highly collaborative environment with diverse and innovative researchers should have been another good reason.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
It’s my honor to receive the award because this to me is a great recognition by the JHU School of Medicine scientific society. I have no connection related to this award.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
I’ve been involved in in vivo imaging studies of the brain cognitive function for many years, even before my postdoc here at JHU, having the experience of setting up two-photon microscopy. Focusing on in vivo imaging research, I could collaborate with great colleagues who specialize in biochemistry, molecular biology and electrophysiology, and I could co-first author the papers by collaboration. The inspiring research guidance of my mentor, Dr. Paul Worley, was critical in completing research.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
I think this yearly celebration provides good opportunities to promote their research to Hopkins society.

Q6: What has been your best/most memorable experience while at Hopkins?
The 2020 summer retreat with members of the Worley lab — we did tubing at Gunpowder River. The water was freezing cold even during the hot summer because the water was coming out from the bottom of the reservoir, but once we got into the water, it was really fun.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I will be seeking a faculty position to pursue my future research. At the same time, I’ll be working on some grants for my career transition. I do want to continue working on the function of NPTX2 in cognitive function.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
I like watching SF movies, running or biking along beautiful trails and playing soccer. But I am able to do none of these juggling between work and home since my lovely son, Sean, was born around two years ago and my wife goes to Peabody to study opera as a soprano. Life has been tough recently, but I’m so happy for Sean, and I want to thank Heejin, my wife, whom I love.
Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?

There is still no cure for the 38 million people worldwide living with HIV-1, due to the persistence of the virus in a latent reservoir of CD4+ T cells. Efforts to cure HIV-1 infection by reducing the size of this reservoir have focused on the shock and kill strategy, which relies upon inducing viral gene expression and revealing infected cells to the immune system (shock). Infected cells can then be targeted for destruction by immune cytolytic cells (kill). While some chemical agents have induced slight increases in HIV-1 gene expression, reductions in the size of the latent reservoir have not been observed. Critical to the success of shock and kill, then, is the development of novel kill strategies that can enhance the destruction of infected cells. My research in the labs of Drs. Robert and Janet Siliciano and Dr. Scheherazade Sadegh-Nasseri focused on how HIV-1 is recognized by the immune system and whether we could generate reagents that could promote recognition and killing of infected cells. This highly team-based study led to the discovery and production of bispecific antibody engagers that are exquisitely specific and sensitive to minute quantities of HIV-1 peptides presented on the surface of infected cells. These bispecific antibodies, with domains specific for both HIV-1 and cytolytic T cells, enabled robust killing of HIV-1 infected cells, in a manner dependent on the quantity of HIV-1 peptides presented on the infected cell. Given the many millions of individuals affected by this incurable disease, understanding mechanisms that could guide improved immunotherapies for cure strategies is essential.

Q2: Why did you choose Johns Hopkins for your work?

I was drawn to its world class clinical and research training, wonderfully collegial environment and an incredible, curious and inspiring group of classmates. Additionally, I attended JHU [The Johns Hopkins University] for undergrad and had the opportunity to be mentored by several brilliant and caring researchers and physicians. This gave me added confidence that Hopkins would be a nurturing environment to pursue my M.D./Ph.D. training, and so far, it has not only met but far exceeded these expectations.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?

It is extremely rewarding to receive recognition for the hard work that went into this project, which included contributions from several student trainees and collaborators. I am specifically delighted to receive the Paul Talalay Research Award. Dr. Talalay founded and was the first director of the M.D./Ph.D. program at Johns Hopkins. I am grateful for his efforts to build a training pathway at Hopkins for those of us seeking to combine clinical and research training, and for his dedication to our program. Receiving this award bearing his name is very humbling!

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)

Interesting ideas in science often emerge from conversations involving coffee and food. One such conversation led to very fortuitous collaborations that kick-started this project’s success. This project was an enormous team-based effort that involved dedication from several talented undergraduates and graduate students who I was lucky to work with and learn from throughout my Ph.D. I also benefited from the astute scientific advice of my thesis committee and a great support system composed of my lab mates, friends and family. I was fortunate to have incredible PIs — Drs. Robert and Janet Siliciano and Dr. Scheherazade Sadegh-Nasseri. They gave me the freedom to start a project that was not the major focus or expertise of either lab and move it forward independently. At the same time, they guided me, helped me troubleshoot and kept me inspired. They believed in me and entrusted me with the responsibility of mentoring several students early on in my Ph.D., without whom this work would not have been possible.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?

Young Investigators’ Day represents precisely why I feel that Hopkins is a true gem of a place to pursue clinical and research training. There is an incredible emphasis here on nurturing and celebrating the growth of each new
generation of trainees, and this serves as an inspiration to younger students starting their training.

Q6: What has been your best/most memorable experience while at Hopkins?
I have experienced many personal and professional milestones while at Hopkins, but one of my most memorable experiences was my thesis defense. This moment represented the culmination of several years of hard work and persistence, along with the ideas and efforts of trainees I had mentored and collaborators who had gone above and beyond to move the science forward. Seeing everything come together at the end was incredibly rewarding. Experiencing the joy and pride of my parents, friends and loved ones as I shared my research was profoundly moving.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I am currently finishing my medical training and will apply to residency programs this fall, with the goal of pursuing a physician-scientist career in the future, conducting immunology-based research.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
I have lived in Baltimore now longer than anywhere else in my life, but am now re-discovering it from the lens of my son. We love finding small neighborhood playgrounds and parks. His bar is pretty low though — as long as there's dirt to dig, he couldn't be happier!

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Nanami Senoo, Ph.D.
Alfred Blalock Research Award

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
I study the significance of phospholipids in mitochondria in the Claypool lab. My current focus is on cardiolipin — a signature phospholipid that ensures cellular energy production via oxidative phosphorylation. Cardiolipins have been evolutionarily found in the structures of the ADP/ATP carrier, which exchanges ADP and ATP across the membrane to enable oxidative phosphorylation. Our recent work revealed that the cardiolipins within the ADP/ATP carrier support its structure and activity. This finding highlights the conserved important roles of specific lipid-protein interactions in mitochondrial biology.

Q2: Why did you choose Johns Hopkins for your work?
I joined Dr. Steven Claypool’s lab, aka the Mitochondrial Phospholipid Research Center, because I wanted to study phospholipids. This is a good place that makes me focus on lipids.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
I feel really honored to receive this award and hope it will help my career. This award encourages me to continue participating in science.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
There were several hurdles to continue this project. An error in mutant design, which I realized about one year after I started, made me start over everything that I had completed at that time. And the pandemic gave me a lot of struggles — trouble with international shipping to send our samples to collaborators was a tough one. Patience and great people surrounding me, including my mentor, Dr. Claypool, and our collaborators who performed excellent work, have been critical.
Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
It is a good opportunity that gives students and fellows motivation to develop themselves, and it enables their research to be recognized.

Q6: What has been your best/most memorable experience while at Hopkins?
I like the atmosphere here in which people warmly interact. It was obstructed by the pandemic but has been becoming back normal, which is what I feel great about.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I am planning to wrap up my ongoing projects and begin to prepare for applying for faculty positions.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
I have enjoyed beer since I came to the United States. I am hoping to travel around looking for good ones.

Jie Wang, Ph.D.

Albert Lehninger Research Award

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
The iris — the colorful tissue that rings the pupil — plays an important role in visual function by controlling pupil diameter to regulate the amount of light entering the eye. It is also a site of diverse ophthalmologic diseases and a potential source of cells for ocular auto-transplantation. In the laboratory of Dr. Jeremy Nathans, my research focuses on deciphering the cell types of the mouse iris and their genomic response to pupil dilation. More specifically, our work has (1) defined all of the major cell types in the mouse iris, (2) discovered two types of iris sphincter cells and two types of stromal cells, (3) revealed the differences in cell type-specific transcriptomes in the resting and dilated states, (4) clarified the neural crest contributions to the iris by using the Cre-loxP system. These findings expand on our fundamental understanding of the iris and should be a valuable reference for investigations of iris development, disease and pharmacology, for the isolation and propagation of defined iris cell types, and for iris cell engineering and transplantation.

Q2: Why did you choose Johns Hopkins for your work?
Johns Hopkins is one of the best universities in the world, for its medical school. There are so many incredible scientists working here. So, it is a great opportunity for me to pursue my research goals at Hopkins and learn how to be a qualified scientist in the future.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
I am so honored and overwhelmed with gratitude to have been selected to receive the Albert Lehninger Research Award. Personally, I am so excited to be one of the recipients of the Young Investigators’ Awards recognized at Hopkins. It helps me improve my confidence and allows me to contribute with more efficiency. Professionally, it motivates me to make more efforts to making greater discoveries. Dr. Lehninger is a great biochemist, and he made fundamental contributions to the current understanding of metabolism at a molecular level. He is a great example for me to follow to pursuit the dreams of science.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
The success of this project depends on the people in the Nathans lab. Firstly, I am so thankful to receive great training and support from my supervisor, Jeremy Nathans. When we discussed the problems we met, he always gave me constructive suggestions and inspired me to explore the unknowns in science. Secondly, I gained a lot of help from my colleague, Amir Rattner, who taught me how to analyze the data. Thirdly, my other colleagues contributed to this project’s success through scientific discussions.
Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?

Young Investigators’ Day is a great tradition to celebrate the discoveries or breakthroughs in research made by the people from Hopkins. It recognizes the work done by the young trainees and motivates them to continue the future research. It is also an exchange platform for new techniques, new discoveries and new ideas.

Q6: What has been your best/most memorable experience while at Hopkins?

The best experience I’ve had at Hopkins was communications and collaborations. I enjoyed the discussions with my mentor and my lab mates, and finally we found a good solution together.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?

I will be completing my current project this year and I will be applying for a faculty position to continue my career in academia.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?

In my spare time, I like reading and mountain climbing.

Yanbo Wang
Michael A. Shanoff Research Award

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?

DNA fluorescence in situ hybridization [DNA FISH] allows for visualization of specific DNA sequences inside the cells, so it is a powerful tool for studying chromatin conformational changes and protein-genomic DNA interactions. Conventional DNA FISH requires global genome denaturation by high temperature, which is very harsh and may disrupt some heat-labile structures. To overcome this limitation, I developed a physiological-temperature DNA FISH method called genome oligopaint via local denaturation FISH [GOLD FISH]. GOLD FISH uses an enzymatic approach to locally denature genomic DNA, avoiding the harsh treatment in conventional DNA FISH. GOLD FISH can efficiently label both repetitive and nonrepetitive DNA sequences in cultured cells and tissue sections, allowing for studying chromatin conformational changes and cancer-relative copy number variations. In addition, GOLD FISH has single-nucleotide sensitivity, which can detect pathological point mutations and base-editing events in pathological samples. Taken together, the method I developed in the Dr. Taekjip Ha’s lab can facilitate both basic research and clinical diagnosis.

Q2: Why did you choose Johns Hopkins for your work?

Johns Hopkins has strong faculty in biology and medicine, and sufficient funding to support researchers here. Also, the collaborative environment and supportive staff at Johns Hopkins ensure that researchers can work efficiently. Therefore, I chose to pursue my Ph.D. degree at Johns Hopkins.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?

It is a great honor to be chosen to receive the Michael A. Shanoff Award. Personally, it motivates me to continue my career in scientific research. Professionally, it is a recognition of my Ph.D. work and can help me to become an independent investigator.

Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)

I think the opportunity to do research in the laboratory of my thesis adviser, Dr. Taekjip Ha, contributed the most to my project’s success. Dr. Ha has been very supportive, and he encouraged me to think creatively. I was always allowed to explore new things and have the perfect amount of independence to develop my project. Dr. Ha’s unique scientific insights also contributed a lot to the project’s success. In his lab, I gained important experimental skills and built confidence in tackling scientific questions as an independent investigator.
Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
I think Young Investigators’ Day is highly valuable because it can motivate young scientists to make important discoveries and give a chance to learn other awardees’ work.

Q6: What has been your best/most memorable experience while at Hopkins?
I think the moment that my hypothesis got validated by experiments is the best memory for me.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I plan to finish my Ph.D. training and become a postdoctoral researcher in 2022.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
I volunteered to help homeless animals. I will continue to make contributions in improving the quality of life of homeless animals.

Bezawit Abi Woldemeskel
Martin & Carol Macht Research Award

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
I did my research in the laboratory of Dr. Joel Blankson, where we study immune responses to viral infections. Part of my dissertation research involved characterizing T cell responses to endemic coronaviruses and SARS-CoV-2 following natural infections and vaccinations. In early 2020, it was known in the field that some COVID-19 unexposed individuals had T cell responses to SARS-CoV-2 despite never experiencing the virus. These preexisting immune responses might partially explain the divergent outcomes seen following COVID-19 infections. Work from our lab and others has shown that these preexisting T cell responses are partially a result of cross-reactive T cells that were primed by endemic human coronaviruses but can also recognize and respond to SARS-CoV-2. In my recent work, I show that COVID-19 mRNA [messenger RNA] vaccinations also enhance T cell responses to endemic coronaviruses. Additionally, I identified a conserved immunodominant epitope found in human and bat coronaviruses and demonstrate that vaccinated individuals are able to mount cross-reactive T cell responses to this epitope. Our work expands our understanding of cross-protective T cell epitopes and informs the development of vaccine strategies that, it is hoped, will elicit cross-protection across many coronaviruses.

Q2: Why did you choose Johns Hopkins for your work?
Prior to graduate school, my research experience was in an industry setting where I worked on developing immune modulating therapeutics. When I decided to pursue a Ph.D., I wanted to join a program with a translational focus to bridge basic science discoveries to the clinic. I decided to attend the cellular and molecular medicine program – CMM – at the Johns Hopkins University School of Medicine because it offered a unique curriculum and included research faculty whose work aligned with my interests. Further, during my interview, I really enjoyed interacting with students in the program, and the Hopkins environment seemed super welcoming and collaborative.

At the time, my sister was also pursuing her Ph.D. at Johns Hopkins, and having left home at 17 to attend college hundreds of miles away, it felt like the best opportunity to live close to family. Finally, I wanted to live in Baltimore because it offered a city life that was fun, affordable and enjoyable on a grad student stipend, with easy access to D.C.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?
I first attended the Young Investigators’ Day celebration in 2019, and it was inspiring to see trainees being recognized for their exceptional work. I am honored to receive the Martin and Carol Macht Research Award and to be included in the list of students who have received this award. It is a recognition of an exciting journey of personal and professional growth, and the support of amazing friends and mentors along the way.
Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)
It has been such a pleasure to work with my mentor, Dr. Joel Blankson, who is a brilliant scientist and a caring mentor. My project’s success is a result of his exceptional guidance and feedback. Together, we were able to identify and effectively test hypotheses, and make meaningful contributions to a rapidly evolving, fast-paced field. In addition, invaluable feedback from my lab mate Caroline Garliss, my thesis committee members and collaborators, including Kellie Smith’s group in the cancer center and Arbor Dykema, was essential.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?
Graduate students, postdocs and fellows are the backbone of academic research. As such, I think it is great that the Young Investigators’ Day celebrates the accomplishment of trainees and highlights their contributions to science. I hope this celebration continues in the years to come.

Q6: What has been your best/most memorable experience while at Hopkins?
It is difficult to pick a single experience, but my most memorable experiences all involve spending time with classmates, friends and lab mates over coffee or drinks.

One of the most impactful and rewarding experiences I had at Johns Hopkins was when I was working on the executive board of the Biomedical Scholars Association to increase support for students from diverse backgrounds.

Another memorable experience was watching my undergraduate student rapidly progress though her scientific journey, which she demonstrated during a journal club and ultimately by winning a poster award at a national conference.

Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I am graduating and leaving Baltimore in May. I am excited to spend the summer traveling and spending time with friends and family. Ultimately, I plan to pursue a career in the startup/biotech space, and I am excited for my next career steps toward that goal.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
My sister, Selam Woldemeskell, received her Ph.D. at Johns Hopkins and won a Young Investigators’ Day award in 2019. So, I am now the official copycat of my family. We were born and raised in Addis Ababa, Ethiopia, and it feels so surreal that we had the opportunity to pursue our education in the U.S., at world renowned institutions. It’s not something my sisters and I envisioned growing up and I am grateful that we were so lucky, and I feel proud of how much we have accomplished.

I love dancing and am always looking for great dance spots!

Katharine M. Wright, Ph.D.
Paul Ehrlich Research Award

Q1: Please describe briefly and in simple terms your research discovery. Why is it important in the context of your field? In what lab did you do the research?
The emergence of immunotherapy as an important tool in the fight against cancer takes advantage of the exquisite specificity of antibodies. Targets, however, are limited to those on the cell surface, while most driver mutations occur in the genes encoding intracellular proteins. To overcome this limitation, antibodies can be engineered to target peptides derived from mutant proteins that are presented on the cell surface by major histocompatibility complex class I [pMHC-I]. My studies conducted in the Gabelli lab elucidated the structural basis for antibody recognition to MHC-presented neoantigens to garner potent “off the shelf” therapeutics. Specifically, we have designed and developed two antibody bispecifics, called H2 and V2, that target a peptide derived from the tumor suppressor gene TP53 R175H mutation and the oncogene KRAS G12V mutation, respectively. Binding kinetics experiments revealed the two bispecifics bind their respective mutant pMHC with different kinetics, suggesting different modes of binding. The structure of the p53R175H-pMHC bound to the H2-Fab fragment showed
that the H2 antibody formed a cage-like configuration around the p53\textsuperscript{R175H} peptide, trapping the mutant histidine [His\textsubscript{175}] and the adjacent arginine [Arg\textsubscript{174}] residues in a stable interaction, providing the structural basis for the specificity. In contrast, the structure of the KRAS\textsuperscript{G12V}-pMHC bound to the V2-IgG showed a very hydrophobic interaction and a conformational change upon binding, highlighting the specificity. Notably, the two antibody fragments, in a bispecific format, induced a potent and specific T cell response. Our detailed structural understanding of the mechanisms of specificity allows for the development of more effective therapeutics. By exploiting the MHC-I presentation of neoantigens, we have achieved the first step toward a precision off-the-shelf medicine therapeutic that selectively targets mutated driver genes.

**Q2: Why did you choose Johns Hopkins for your work?**
I chose The Johns Hopkins University because the institution is the home of novel discoveries and many firsts. For example, Hopkins was one of the first universities to admit women into medical school and higher education programs, an essential principle for myself as a woman Ph.D. in science. Along those lines, I wanted to have mentors that were women who hold high level titles as I proceeded in my scientific career. Therefore, joining Dr. Sandra Gabelli’s lab allowed me to have that opportunity as well as expand my structural biology knowledge, learning both X-ray crystallography and cryo-EM.

**Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received?**
I am very honored to receive the Paul Ehrlich Award. For me personally, it provides me with drive to continue research in fields of high impact and need. As a pioneer in the field of immunology, Paul Ehrlich popularized the concept of a “magic bullet,” which is a drug specifically targeting a particular pathogen without affecting normal cells. This idea of a target-specific approach is fundamental and the basis for my work and research discovery.

**Q4: What contributed to your project’s success? (Special skills, interests, opportunities, guidance, etc.)**
The talented, hard-working and dedicated people that I have been lucky to work with on this project — specifically, the mentorship I gained from Dr. Gabelli was a driving force in critical moments. She was encouraging, patient and supportive in all aspects of the project. Also, I have had the pleasure to work in a collaborative, multidisciplinary and hypothesis driven environment with the Kinzler-Vogelstein-Zhou lab, which has allowed me to learn drug discovery for immuno-oncology.

**Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins?**
Young Investigators’ Day is a community day during which JHU celebrates its trainees’ achievements. Events such as this one make trainees feel appreciated by JHU.

**Q6: What has been your best/most memorable experience while at Hopkins?**
The most memorable moment was when the paper on targeting a p53 neoantigen, of which I am co-first author, was accepted into the journal Science for publication! This achievement highlighted the true teamwork, diligence and perseverance that is needed in scientific research.

**Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?**
In the next year, I plan to publish the work presented here on the structural determinants for targeting the KRAS G12V mutation. During that time, I will also be taking the next steps to continue my career in structural biology in industry.

**Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?**
I love to kickbox, especially early in the morning before work. For an hour, I only think about the exercise, nothing else, and this allows me to get ready for my day!
Uniquely among mammalian organs, skin is capable of dramatic size change in adults, making it ideal for studying size control mechanisms and regenerative medicine. The remarkable capacity of adult skin to grow under constant stretch is utilized clinically for reconstructive purposes in a process named tissue expansion, yet the mechanisms are unclear. In an established tissue expansion model in mice, we found that stretch preferentially activates Lgr6+ skin stem cells for skin growth through YAP. By using microarray and single-cell RNA sequencing, we uncovered additional changes in mechanosensitive and metabolic pathways underlying growth control in the skin. This collaborative study between the laboratories of Luis Garza and Sashank Reddy sought to understand the cellular and molecular mechanisms underlying stretch-induced skin regeneration. Our discoveries provide insight into designing future therapies to enhance skin growth for conditions of excess or inadequate skin. Furthermore, the findings here establish a platform for understanding the size dynamics of organs in adult mammals.

Q2: Why did you choose Johns Hopkins for your work? Hopkins is a great place to study.

Q3: What does receiving this award mean to you personally and professionally? Do you have any connection with the particular award you received? Personally, it's thrilling that the professionals of the YIDP committee recognized our work. Meanwhile, I believe this award will help my professional growth. I am deeply grateful to receive the Claude & Barbara Migeon Award — it dramatically inspires my future work.

Q4: What contributed to your project's success? (Special skills, interests, opportunities, guidance, etc.) Many things led to the current achievement of my project. The most important things are:

First, the guidance from my PIs and the support from the Department of Dermatology and collaborations with other labs are essential. My adviser, Dr. Luis Garza, and my collaborating adviser, Dr. Sashank Reddy, are intelligent and dedicated and always give me their best suggestions. Dr. Reddy started this project by combining his experiences of clinical tissue expansion surgery and his scientific training in skin regeneration. Our chairman of the Department of Dermatology, Dr. Sewon Kang, has always supported my work and future career development. Our collaborators in Dr. Denis Wirtz's lab performed outstanding computational 3D skin reconstruction. Moreover, our students and all the team members of this project contributed many endeavors to make progressions.

Second, the environment in the Garza lab is relaxed and aspirant, making our work run smoothly. Our neighbors from Dr. Nate Archer's lab are kind and generous in sharing equipment and space with us. Dr. Garza is brilliant, tolerant and efficient — he is a great model for lab folks. Besides being a dermatologist and a scientist, he is also a gifted painting artist. His spirit of never stopping learning inspires my changes in work and life.

Lastly, my interest in research and the support from my family energize me.

Q5: What thoughts do you have about Young Investigators’ Day itself, as a celebration of the roles students and fellows play in research at Hopkins? The Young Investigators’ Day Program promotes communications between research labs. Also, it inspires trainees’ confidence in research.

Q6: What has been your best/most memorable experience while at Hopkins? People here at Hopkins are intelligent and hard working. You can always learn something from the colleagues around you.
Q7: What are your plans over the next year or so? Graduating, looking for faculty positions, etc.?
I will look for faculty positions as long as my interest in science continues.

Q8: Tell me something interesting about yourself that makes you unique. Do you have any special hobbies, interests or life experiences?
My fiancé and I like hiking, exploring new parks and trying new foods.