



**THE OHIO STATE
UNIVERSITY**

WEXNER MEDICAL CENTER

Medical Scientist Training Program

May 2020



IN THIS ISSUE...

Director's Comments

Page 2

Virtual Research Day

Page 7

Outgoing MSSO Officer Statement

Page 3

Congratulations to our M4 Graduates!

Page 8

COVID-19 and the Medical Scientist Trainee

Page 4

M4 Profiles

Page 9

Enacting Change During COVID-19

Page 5

Achievements and Publications

Page 19

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Director's Comments

As I started to write this column, I considered beginning with a musical quote. R.E.M.'s *It's the End of the World as We Know it (and I Feel Fine)* crossed my mind, as did the words "Welcome to the new age" from Imagine Dragons' *Radioactive*. However, thinking a bit more about it, I eventually settled on one my musical favorites, "Meet the new boss, same as the old boss," from The Who's *Won't Get Fooled Again*.



We are living right now through an event that none of us expected, even as recently as a few months ago. In current times, we are unable to gather for a meal or a meeting, and most of our social interactions occur over electronic means. Yet, life goes on, and we should all aim to be a part of that forward progress, whether that means working in the lab on COVID-19 research, providing support to others through help with daycare or volunteering, or even just hunkering down at home trying to stay safe and stay sane.

From my own experience, the only parallel I can draw is from my time as a senior MSTP student taking care of HIV patients hospitalized in the north central Bronx in the early 1990s. At the time, a diagnosis of AIDS was a death sentence, and I still have clear memories of watching patients wither and die as their loved ones could only watch. As grim as it sounds, the experience also gives me hope now, because what was at the time an incurable and deadly disease is now a condition for which I see frequent advertisements on the television. And of course, then, like now, the advances that are going to renew our world are going to come from the dedication of physicians and scientists who see these challenges not as insurmountable obstacles, but as research questions for which the answers will one day exist.

I am confident that some of you who are part of our OSU MSTP right now will be among the group of scientists who will solve the coronavirus problem or ones like it that will arise in the future. Now is not the time to be plagued with worry, but to gather our resolve and redouble our research efforts, whether they be in COVID, cancer, mental health, or whatever disease is in need of new advances. I can't wait to see what these new paradigms will be.

In addition, in this time of trouble, it is more important than ever to make time for yourself, your family, and your loved ones. The future is unwritten, but we can take steps in the present to make sure that whatever it brings, we can be sure not to regret the time we spent with the people that are most important, including friends here. We are all in this together, and that network of support, like a tightly cross-linked collagen matrix, is what makes each of us stronger and more resilient.

Lastly, I know that the current situation is causing anxiety for many of you about the simple facts of your MSTP experience. I expect that for the majority of you, these few months of limited work will not have a major impact on your course through the program. If that means one or two fewer papers, so be it. Every MSTP student across the country is the same boat, so program directors will understand how this might have affected you. Leadership will support you now and into the future to ensure your value as a successful MD-PhD retains its luster. For each class and each student, the current situation will affect you slightly differently, and we will work to make sure that your talent and effort is communicated clearly when you are ready to move to the next step in your career. For those thinking about an extra year, that will be always be an option open for those who wish to consider it.

We will all get through this together, and then get back to the real business of creating new knowledge and improving human health. Now more than ever, we need your passion, your creativity and your insight. Stay safe, stay engaged, and stay optimistic, and I can't wait until I can see you all in person at an MSSO!

-- Lawrence Kirschner, MD, PhD, OSU MSTP Program Director



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Outgoing Medical Scientist Student Organization Officers Statement

At the beginning of the academic year, our 2019-2020 board created a mission statement for our officers:

“MSSO Officers are student leaders of the MSTP who will serve the program as both advocates, for the needs and effective training of students, and ambassadors, between students, leadership and other groups at OSUCOM, to ultimately influence the direction and continued success of our program.”

Following this, we felt our first priority was to improve the programmatic feedback session at the summer retreat. We facilitated small group sessions and overwhelmingly found that feedback collected was more detailed. This shaped many of our goals for the coming year. We implemented several changes which can be found in detail on [Buckeyebox](#).

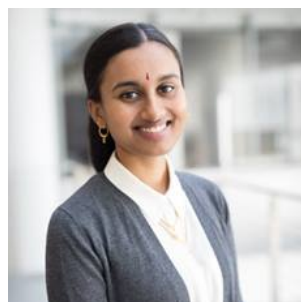
Looking forward, we are excited to improve the transition process for new board members to ensure a successful start to their term. We hope that MSSO Seminar can continue to be improved with new ideas for presentation content from students and outside speakers. A goal we were not able to tackle this year was improving the communication between programs and amongst medical, graduate and MSTP students. This has been a consistent desire voiced by MSTP students and will take creativity and dedicated time to approach. Since we overhauled the MSTP handbook and created a student directory this year, we hope that next year's board will be able to dedicate time to updating our organization's constitution, as it has not been updated since before 2000. We would like to extend a heartfelt thank you to our peers and the MSTP leadership for allowing us this opportunity to grow as individuals and improve the program. We are certain that 2020-2021 will be a great year for MSTP students and the incoming officers. We will continue to be inspired by and support our peers in any way we can!



Kylene Daily, G2
President



Tiffany King, G3
Vice President



Akila Venkataramany, M2
Secretary



Zheng Hong Tan, G1
Treasurer



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COVID-19 and the Medical Scientist Trainee

The COVID-19 pandemic has enveloped our news headlines, infiltrated our daily thoughts, and flipped the routines that we took for granted. COVID-19 is a respiratory disease caused by the SARS-CoV-2 virus, which most likely emerged from a wet market in Wuhan, China, where exotic animals like bats (which harbor many of our zoonotic diseases) are bought and sold for human consumption. This pandemic has forced us all into a meditative state—an uncomfortable pause for some, a tenuous fear-ridden uncertainty for others. We, as medical scientist trainees, can use this “time out” as an opportunity to check our ambitions, goals, and vision for the future. Many of us will be the leaders of medical progress for years to come. How we come to understand what caused this pandemic and what we can do about it will shape our career paths and lives.

Witnessing this once-in-a-lifetime pandemic as an epidemiology PhD student is surreal. These are the moments I’ve read about in textbooks, but I never imagined they’d arrive at my doorstep—let alone so soon after learning the foundational principles about them. However, I’ve tried to pause to observe and learn from the world around me during this time. Namely, I’ve done my best to understand how the world has viewed the efforts of the leaders in my field who form the backbone of the public health efforts to stymie the worst outcomes of these unfortunate times. I’ve witnessed praise for public health leaders like the director of the Ohio Department of Health, Dr. Amy Acton. I’ve seen the anger of citizens who want the state reopened, fearing even worse outcomes the longer we keep this stay-at-home order. I’ve even read frustrated economists ridicule the models from my field that may have saved thousands of lives.

In the end, I’ve come to a few conclusions (these may further develop as the pandemic continues to unfold). Firstly, we must invest more in future public health physician-scientists. Dr. Acton is an Ohio State-trained preventive medicine physician who has put Ohio on the map as a public health leader. Institutions like the Ohio State MSTP can play a role by increasing the enrollment in public

health training pathways. Second, all medical scientists must have a stronger appreciation for the power of preventive medicine and the preventive potential of the science they investigate. We need to develop more individuals like Alex Hartlage, a national student leader in vaccine development. Thirdly, the medical system must be more understanding of the social determinants of health. This pandemic does not affect us all equally. People of color and low-income workers are at the highest risk. Unless we distribute our health, care, and provide for wellness more equitably, we’ll continue to see epidemics disproportionately impact our most vulnerable communities. This pandemic will end, but the actions we take after will continue to cause rippling effects for generations beyond our own.



--Dan Brook, G2



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Enacting Change During COVID-19

I am an 7th-year MSTP student who returned to third year of medical school last May. I was in my final ring of third year when the medical school emailed to say that our rotations were suspended and to be replaced with reading online case summaries. I understood that it was the correct decision to protect students, patients, and healthcare workers and to limit the spread of nCoV, but I was also frustrated and disappointed. I loved returning to clinical medicine after having been away for graduate school and relish the personal interactions with patients and families that clinical education affords. I learn far more about a disease when I participate in the care of a patient rather than just reading about it and was frustrated by the lost opportunities. Additionally, I wanted to be able to do my part to help respond to the pandemic and felt helpless being asked to stay home. To settle my initial frustration, I turned my attention to finding a way to help from the safety of my home.



In the weeks leading up to clerkship cancellation I had heard healthcare workers discuss the difficulty they anticipated finding childcare when schools and daycares closed. A few medical students had expressed interest in babysitting in their new-found free time, and I thought some organization could be helpful. I initially made a spreadsheet with contact information of students willing to babysit but this quickly became impractical, as the first few people on the list were bombarded with emails. In order to streamline the process, I made a Google Form to match healthcare workers with student-babysitters. In the first day, the form got more than 40 requests for childcare. A classmate and I worked for hours but could not keep up with requests. Within a day, we had matched nearly all medical-student volunteers with families, so a classmate offered to recruit nursing students whose clinicals had also been cancelled. Despite having more than 100 student-babysitters offer their services, within three days, we exhausted our pool of volunteers. In the 72 hours it was open, the form got 91 requests for childcare. We could not meet the demand and had to close the form and link healthcare workers to the professional childcare app with which the OSU Medical Center was collaborating. While I was surprised at the magnitude of the unmet need we had identified, I was most surprised by the national and international attention our project received. Fellow medical students had tweeted about the project and were contacted by student groups from as far away as New Zealand asking about how they could begin a similar project in their communities. Additionally, reporters from local and national organizations reached out to report on our project. While the project had to end as quickly as it started, it filled an important need for many healthcare workers.

With my childcare project receiving attention on social media and from local and national media outlets, I became a contact person for those who were in need. I was able to link organizations and individuals from around Ohio to students who were willing to help. I was contacted by a physician working with seamstresses to make reusable gowns and needed students to help manage distribution of supplies, and I linked her with available and enthusiastic students. I heard from students in Cincinnati who hoped to collaborate with OSU students on a project that would match vulnerable people with young and healthy volunteers to grocery shop and run errands, and was able to link them with fellow MSTP students Rebecca Glowinski, Kirsten Johnson, and Jillian Liu, who have since launched [Columbus COVID-19 Match](#).

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Shortly after the childcare project came to an end, I was contacted by my PhD advisor, Peter Mohler, asking if I was willing to work on a COVID-19-related project. In collaboration with Battelle, he was working to bring high-throughput testing for nCoV to OSU. Having had experience with project management, managing supply inventory, and working with industry during graduate school, I was able to help secure needed supplies and personnel for the newly created BRT Molecular Biology clinical laboratory. I worked on a team of physicians, clinical lab staff, and researchers to meet these goals. While I would have never believed it possible, our team was able to make an empty research lab in the BRT, into a clinical laboratory processing hundreds of samples a day in less than two weeks. One of the clinical lab staff commented on our rapid progress, saying: "Rome may not have been built in a day, but a COVID lab can be built in a week!" Along with several other MSTP students, I have continued to work in the lab as a technician, aliquoting samples and running low- and middle-complexity nCoV tests.

Coordinating childcare, linking students with volunteer organizations, and staffing a clinical lab were not activities I planned to do during my third year of medical school. I am disappointed that I will finish third year having never seen a pediatric outpatient and that I lost the opportunity to experience emergency medicine before deciding on a specialty. However, I have gained real-world experiences in interprofessional collaboration, clinical laboratory science, and project management that would never have been covered by a medical school learning objective. Additionally, I am proud of the role OSU medical and MSTP students and I have played in our community's response to a global pandemic.

--Ellen Lubbers, M3



Virtual Research Day

The 19th Ohio State University Wexner Medical Center Trainee Research Day was held on April 16, 2020. Due to the COVID-19 pandemic, the in-person Research Day event was unfortunately cancelled. However, thanks to the work of OSUMC administration and the student committee, a virtual Trainee Research Day was able to go on during the scheduled time. Trainees submitted posters and recorded presentations which were submitted for viewing and virtual judging by OSUMC faculty. Trainees represented a diverse group of training level, including undergraduate, graduate, postdoctoral, the MD/PhD program, medical student, and medical residents and fellows.

5th Year MSTP student Kevin Blum served as the chair of the Research Day Planning Committee. A number of MSTP students also served on the planning committee, including Matthew Lordo, Lisa Dorn, Charles Rabolli, Felix Yang, Arden Piepho, Jerry Cui, Max Yano, Aaren Kettlehut, and Zheng Tan. Dr. Ginny Bumgardner and Dr. Jeffrey Parvin served as hosts for the virtual event.

A Virtual Keynote was given by Dr. JoAnne Flynn, distinguished professor, Department of Microbiology and Molecular Genetics, University of Pittsburgh School of Medicine. Her Keynote Lecture was entitled “The Path to Immunity in Tuberculosis.” In addition to the Keynote by Dr. Flynn, the Virtual Research Day included two State of the Art speakers from The Ohio State University. The first was given by Dr. Tamar Gur, assistant professor of psychiatry & behavioral health, neuroscience, obstetrics & gynecology, and the associate director of The Ohio State University Medical Scientist Training Program. Her talk was on “How Prenatal Stress Disrupts Neurodevelopment: *In Utero* and Beyond”. The second State of The Art Speaker was Dr. Oluyinka Olutoye, Surgeon-in-chief of general pediatric surgery at Nationwide Children’s Hospital. He spoke on “The Evolution of an Idea,” regarding his research in necrotizing enterocolitis.

Following the talks, awards were given to posters in each trainee category. The winners in the MD/PhD trainee category were Sydney Forbare and Kylene Daily. The 2020 Research Mentor of the Year Award was given to Dr. Robert Baiocchi, professor on internal medicine, associate division director of clinical and translational research, associate residency program director for research in the Department of Internal Medicine, and director of The Ohio State Physician Scientist Training Program.

Overall, the Virtual Research Day was quite a success, allowing the interaction of medical science-oriented minds and the sharing of research across the College of Medicine. The work instilled by everyone involved in organizing the virtual event to continue the Research Day tradition in spite of the global event. Thanks to all who participated in the organization and planning committee, submitting research, and attending the virtual event. And congratulations to the winners of the awards! We look forward to next year’s research day event.

-- Kevin Blum, G3





Congratulations to our M4 Graduates!

This year, the OSU MSTP Program is proud to feature a stellar M4 cohort! Though in-person graduation celebrations were cancelled due to COVID-19, the program honors these students' accomplishments and thanks them for their contributions over the years. We wish them the best as they move on to the next stage of their training!

Jae-hoon Chung – OSUWMC, Internal Medicine

Samantha Coss – Nationwide Children's Hospital, Pediatrics

Katherine Hartmann – University of Pennsylvania, Radiology – Research Track; Santa Clara Valley, Internal Medicine Prelim

Kavin Fatehchand – NYP Hospital – Columbia University Medical Center, Psychiatry

Zachary Hing – University of Pennsylvania, Internal Medicine

Kirsten Johnson – University of Arizona, Internal Medicine/Pediatrics

Jillian Liu – Maine Medical Center, Pre-Residency Fellowship in Ophthalmology

Sankalp Malhotra – OSUWMC, Internal Medicine

Kelly Regan-Fendt – Children's Hospital of Philadelphia, Pediatrics/Genetics Combined Program

Sean Reiff – UT Southwestern, Pediatrics PSTP

Theresa Relation – OSUWMC, General Surgery Prelim

Michael Sharpnack – University of California, San Francisco, Pathology

Jason Siu – University of Washington, Pathology

Anisley Valenciaga – OSUWMC, Internal Medicine PSTP



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OUR M4 GRADUATING CLASS!

MD/PhD Experience:

AV: In whose lab did you do your PhD, and what did you study?

JC: Paul Janssen, PhD, pathophysiology of heart failure.

AV: How did you figure out what specialty you wanted to pursue?

JC: I loved the Cardiopulm block from the first two years of medical school, which led me to join a cardiac physiology lab. I also loved my internal medicine rotations, where I got to make my own assessments and develop plans to directly help my patients and had a great relationship with the residents and attendings. I also thought about CT surgery as well because they do awesome life-saving procedures and surgeries, but I didn't love the OR enough, which ruled out a lot of surgical and procedure-heavy specialties.

AV: How did you approach applying to residency, and was there anything about the application/interview process that you did not expect?

JC: IM interviews were very chill and mostly conversational. I was able to drive to a lot of my interviews in the Midwest and on the East Coast (thanks to my wife who also did some driving) and ended up spending less than I thought I would for my interviews.

AV: What is one of your favorite memories from your time in the MSTP?

JC: I have a lot of great memories from my time here. Our class had holiday parties every year at Kelly's house, which was always a lot fun. It was awesome to "grow old" with my classmates as they got married and started having kids.

Future Plans and Advice to Students:

AV: What are your plans after graduation?

JC: I am starting my internal medicine residency at OSU.

AV: What are some key lessons or words of wisdom you want to pass along to younger students in the program?

JC: Perseverance is the word that comes to my mind. It is such a long journey, and there will be difficult times along the way as one progresses through medical school and graduate school. But in the end, I really feel like I matured a lot in the process and gained a very unique perspective with respect to basic science and clinical medicine.

AV: As you look ahead, how do you see yourself using your MD/PhD training?

JC: My goal is to become a cardiologist at an academic medical center. I still want to spend a significant amount of my time doing research although I am not exactly sure if I will be doing bench vs translational research. I think MD/PhD training gives you a lot of flexibility and opens a lot of doors in your career, which I have become more appreciative of.



Jae-hoon Chung

Hometown: Hoffman Estates, IL

Undergrad: Northwestern University

Favorite Activity: Tennis in the RPAC courts/
indoor tennis

Favorite Restaurant: too many to name... Akai Hana?



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MD/PhD Experience:

AV: In whose lab did you do your PhD, and what did you study?

SC: Rob Honegger/Chris Walker, viral immunology.

AV: How did you figure out what specialty you wanted to pursue?

SC: What felt right, where I was happiest.

AV: How did you approach applying to residency, and was there anything about the application/interview process that you did not expect?

SC: I over-applied (I DO NOT recommend this!). No real surprises. PSTPs will wine and dine you, but otherwise the interview trail can be brutal. Different specialties clump their interviews at different times (Peds is very heavy in Oct/Nov).

AV: What is one of your favorite memories from your time in the MSTP?

SC: Helping out with SUCCESS events.

Future Plans and Advice to Students:

AV: What are your plans after graduation?

SC: No travel because of COVID, but hanging out with the husband/dogs, house hunting, getting ready to move.

AV: What are some key lessons or words of wisdom you want to pass along to younger students in the program?

SC: I am happy with where I am at in my life and career. That means having a good life that isn't totally about medicine. That is right for me. Do what is right for you, even if that means an eight year residency in Neurosurg or whatever.

AV: As you look ahead, how do you see yourself using your MD/PhD training?

SC: I plan to continue research during residency and hope to go on to a fellowship in Peds Rheum, which is well suited to research.

Samantha Coss

Hometown: Erie, PA

Undergrad: Johns Hopkins University

Favorite Activity: Go-down Dog Park

Favorite Restaurant: Mazah



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MD/PhD Experience:

AV: In whose lab did you do your PhD, and what did you study?

KH: Wolfgang Sadec. I studied the missing heritability of coronary artery disease – focusing on interactions between genetic variants to better account for risk profiles.

AV: How did you figure out what specialty you wanted to pursue?

KH: M3 clinical rotations and required lectures. I loved learning about the physics behind images, and when I finally got to the reading room, I didn't fall asleep. Just kidding. In reality though, I loved learning how to interpret images; it felt very much like interpreting data.

AV: How did you approach applying to residency, and was there anything about the application/interview process that you did not expect?

KH: I applied broadly to both internal medicine PSTPs and radiology residencies looking for what would be the best fit for me given my primary desire to pursue an academic career. I was surprised by how specialty-specific the process was.

AV: What is one of your favorite memories from your time in the MSTP?

KH: Anything involving Amanda Campbell and Steven Scoville.

Future Plans and Advice to Students:

AV: What are your plans after graduation?

KH: I will be doing a prelim year in Internal Medicine at Santa Clara Valley Medical Center. It is the county hospital serving Silicon Valley and has a wonderful culture rooted in housestaff dedicated to serving what can be a difficult but very rewarding patient population. This will be followed by Radiology Residency at Penn as part of their research track.

AV: What are some key lessons or words of wisdom you want to pass along to younger students in the program?

KH: Pursue those thoughts and projects and opportunities that have to be done, not just those that can be accomplished. Don't be afraid to build your own path if the one laid out doesn't fit to you. Always ask as many people as possible for advice and help along the way.

AV: As you look ahead, how do you see yourself using your MD/PhD training?

KH: I think you end up using your MD/PhD training in everything you do – even the small, mundane things like grocery shopping. The credentials I am hoping to use for a career in academic medicine, with a substantial amount of time dedicated to research. I am still developing my thoughts for an area of research focus but have been intrigued by the burgeoning field of radiogenomics.



**Katherine (Kate)
Hartmann**

Hometown: Atlanta, GA

Undergrad: Cornell
University

Favorite Activity: Walk
the different neighborhoods
with my dog, Sophie

Favorite Restaurant: Fox
in the Snow



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MD/PhD Experience:

AV: In whose lab did you do your PhD, and what did you study?

ZH: Rosa Lapalombella & John Byrd, my research focused on targeted therapy in CLL.

AV: How did you figure out what specialty you wanted to pursue?

ZH: Talked with mentors about the field, had some clinical exposure too. I was drawn to the emphasis on research in hem/onc, and it felt like a good fit.

AV: How did you approach applying to residency, and was there anything about the application/interview process that you did not expect?

ZH: At least for IM, interviews were laid back and seemed to not be that important. I became hard for me to know how to weight my interview experience/impression when I ranked programs because it felt like it couldn't possibly provide an accurate snapshot of the program. My advice is to research programs you like early and even reach out to program directors to get more info since the interview day is rather standardized and you might not get to connect with people you want to.

AV: What is one of your favorite memories from your time in the MSTP?

ZH: The joint retreat with Case.

Future Plans and Advice to Students:

AV: What are your plans after graduation?

ZH: Internal Medicine residency, hem/onc training after that.

AV: What are some key lessons or words of wisdom you want to pass along to younger students in the program?

ZH: I always found it helpful and rewarding to reach out to senior students in the program to get their advice on things. People here have always seemed willing to share their experiences, and that helped me prepare myself for whatever the next transition was.

AV: As you look ahead, how do you see yourself using your MD/PhD training?

ZH: I see myself doing both research and seeing patients with heme malignancies. Not sure what exactly what type of research and what percentage of time I will spend doing it.



Zachary Hing

Hometown: Seattle, WA

Undergrad: Duke University

Favorite Activity: Walk my dog up and down High Street and Italian Village

Favorite Restaurant: Dinner is Commune, Lunch is Brown Bag / Katalina's (tie)



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MD/PhD Experience:

AV: In whose lab did you do your PhD, and what did you study?

KJ: Stephen Lessnick, studying mechanisms of transcriptional regulation in Ewing sarcoma.

AV: How did you figure out what specialty you wanted to pursue?

KJ: By shadowing in every specialty I could, and by realizing which residents were my favorite to work with (who my “people” were) while on the wards/rotations. I chose IM/Peds because I’m interested in transitional care for pediatric diseases like cancer and cystic fibrosis.

AV: How did you approach applying to residency, and was there anything about the application/interview process that you did not expect?

KJ: I chose places to apply based on geographical location and fellowship opportunities.

AV: What is one of your favorite memories from your time in the MSTP?

KJ: Winter Retreat talent show.

Future Plans and Advice to Students:

AV: What are your plans after graduation?

KJ: Med/Peds residency, then combined fellowship in Infectious Disease.

AV: What are some key lessons or words of wisdom you want to pass along to younger students in the program?

KJ: Always try to leave people better than you found them, whether colleagues, patients, family members, whoever, and approach every person as though they have something to teach you—you’ll be amazed what you will learn!

AV: As you look ahead, how do you see yourself using your MD/PhD training?

KJ: Practicing as an infectious disease clinician and running a lab at an academic center.



Kirsten Johnson

Hometown: Albuquerque, NM

Undergrad: Brigham Young University (Utah)

Favorite Activity:
Attending festivals and Shakespeare in the Park

Favorite Restaurant:
Loops



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MD/PhD Experience:

AV: In whose lab did you do your PhD, and what did you study?

JL: Jose Otero, MD, PhD; Neurodevelopment of Autonomic Respiratory Circuits.

AV: How did you figure out what specialty you wanted to pursue?

JL: I was seven the first time I said I wanted to be an eye doctor.

AV: How did you approach applying to residency, and was there anything about the application/interview process that you did not expect?

JL: How much good mentorship in your chosen field means – not only for producing a quality application but also pulling for you behind the scenes.

AV: What is one of your favorite memories from your time in the MSTP?

JL: Disneyworld road trip!

Future Plans and Advice to Students:

AV: What are your plans after graduation?

JL: Going to Portland, Maine to work at Maine Eye Center/MMC where I will function as an ophthalmology resident – taking call and triaging patients with the attendings.

AV: What are some key lessons or words of wisdom you want to pass along to younger students in the program?

JL: If you want something, make it happen.



Jillian Liu

Hometown: Northville, MI

Undergrad: Cornell College,
Mount Vernon, IA

Favorite Activity: Going to
Kingsmakers

Favorite Restaurant: Fox in
the Snow



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MD/PhD Experience:

AV: In whose lab did you do your PhD, and what did you study?

SM: I studied *Pseudomonas aeruginosa* infections in the context of cystic fibrosis in Dr. Daniel Wozniak's lab. Dan is truly a brilliant scientist and, more importantly, a phenomenal human being. I would recommend him as a PI/mentor, committee member, and/or life coach to any MD/PhD student.

AV: How did you figure out what specialty you wanted to pursue?

SM: There were too many parallels between how I was trained to think as a researcher in the laboratory and how internists think on the wards. I loved the idea of a specialty dedicated to carefully formulating differential diagnoses, which reminded me of hypothesis generation and testing. Ultimately, I found "my people" in internal medicine (AKA fellow nerds!).

AV: How did you approach applying to residency, and was there anything about the application/interview process that you did not expect?

SM: In general, I approached the process with a plan. I wanted to pursue categorical IM training (with hopes of returning to research during fellowship). As such, I applied to programs where I was going to get great clinical exposure, opportunities to rotate through every IM subspecialty, and chances to take care of a diverse patient population. The interview trail can feel like a long haul, and it is genuinely exhausting. However, try your best to enjoy it! You will get to see a lot of different places around the country and meet phenomenal people along the way. The free food always helps too.

AV: What is one of your favorite memories from your time in the MSTP?

SM: Performing Abbott and Costello's "Who's on First" with my buddy, Ansel Nalin, at the MSTP Talent Shows.

Future Plans and Advice to Students:

AV: What are your plans after graduation?

SM: I matched at OSU in our Categorical IM Program, so I will be here for another three years. Thereafter, I hope to pursue a fellowship in Pulmonary/Critical Care Medicine.

AV: What are some key lessons or words of wisdom you want to pass along to younger students in the program?

SM: Per usual, I probably have too much advice, accumulated through nine years in this program. Most of it is rather philosophical. Here's my "brave" attempt at a top 10 list (followed by other tips/tricks), please take with several grains of salt:

1. **Be kind to yourself and to others.** Take care of the basics - eat well, exercise often, spend time with the ones you love, and please, sleep! Additionally, when you see others who might be struggling, pick them up- lend them your ear, your shoulder, your counsel. I guarantee you will grow each time you are truly *there* for someone.



Sankalp Malhotra

Hometown: Downers Grove, IL

Undergrad: Miami University (OH)

Favorite Activity: Going to the Shoe for a Buckeye football game! O-H!

Favorite Restaurant: Tie between Tadka and Bahn Thai

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Continued from the previous page...

2. **The ones you love matter most.** Keep your friends and family (and pets!) as close as possible. These are the folks who will ground you and support you relentlessly without precondition. They are the constants to which you will return when all else seems variable. Tell them you love them, as often as you can.
3. **Embrace the process, not just the outcomes.** Goal-setting and achieving benchmarks is something we all do really well. However, reminding yourself of the bigger picture is incredibly important as an MD/PhD student.
4. **Failure is an essential stepping stone.** In graduate school, we often encounter a greater than 90% failure rate in the laboratory. I have never failed that much in my life at anything. Over time, I also figured out that the more I failed, the closer I got to the scientific truth, which was sometimes achieved merely by process of elimination. A breakthrough was almost always around the corner if I continued to learn from and push through my struggles. In short, get comfortable with failing early and often.
5. **Practice patience because there are no short cuts.** Fortunately, both in medical school and graduate school, tenacity always pays off. The lag time between effort input and desired output can vary. It can take a while to see the fruits of your labor, but I guarantee that you will see them...just as long as you have the patience to keep going.
6. **Choose your mentors wisely.** I can write a book on this topic alone. Ultimately, you need a mentorship team. There are those who will give you concrete career guidance, others will be life coaches, and some will act purely as pressure-release valves- folks who will tolerate your rants/complaints, empathize, and then, calmly provide objective advice. I promise that it is okay to walk away from a clinical or research mentor if they are not the right fit for you. Do this diplomatically, do not burn bridges, and seek support, whenever necessary.
7. **Try not to compare your journey with others.** Each of us has a unique path, unique set of skills, unique circumstances. Luck plays *a role*. Regardless, focus on how you can grow and improve along your own personal journey. Do not let your sense of self, your vision, your well-conceived plans be influenced by the accomplishments or progress of others.
8. **Actively pursue hobbies outside of medicine/research.** I play tennis or racquetball almost every weekend, because I need that to stay sane! I started taking piano lessons again in my third year of medical school (for the first time since I was 12 years old) and absolutely loved it. I tried to travel, whenever possible, because I genuinely enjoy it. Life does not stop because you are in an MD/PhD program. As such, do not forget to participate in *all* of the activities that enrich your life.
9. **Seek and accept feedback, when it is offered honestly, constructively, and in your best interest. Disregard the rest.** Obtaining feedback from trusted mentors, teachers, colleagues is one of the most important ways we have to improve.
10. **Be humble, be confident!** Always be humble because in academia, we are *all* students, constantly learning, constantly questioning, constantly refining our knowledge. However, be confident as well. You would not be here if you did not add to this tapestry with your own unique experiences, ideas, skills, and dreams. Be inspired by this environment- do not be intimidated or sacrifice your self-belief.

AV: As you look ahead, how do you see yourself using your MD/PhD training?

SM: I hope to use my MD/PhD training to become an independently-funded physician-scientist. Following residency in Internal Medicine, I will pursue a research-track fellowship in Pulmonary/Critical Care Medicine. Long-term, I hope to balance running a basic/translational science laboratory and caring for patients in the ICU/outpatient pulmonary clinic. I will probably continue studying the host-microbial interface in the context of lung diseases, but I am also fascinated by transplant immunobiology...so who knows? The only certainty in all of this is that I am looking forward to the next chapter!



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MD/PhD Experience:

AV: In whose lab did you do your PhD, and what did you study?

KR: I joined a biomedical informatics lab led by Philip Payne, PhD. My thesis project involved developing and validating a computational method for drug combination predictions in melanoma using genomic and transcriptomic data.

AV: How did you figure out what specialty you wanted to pursue?

KR: I was always interested in Pediatrics. It wasn't until M3 year when I was taking care of kids with complex medical conditions where I really appreciated the thoughtful approach to coordinated care for this patient population that got me interested in Peds/Genetics. I did a Peds Genetics rotation early in M4 year, and that sealed the deal – I loved the mix of ambulatory and acute care, and everyday there was something new and interesting to learn about!

AV: How did you approach applying to residency, and was there anything about the application/interview process that you did not expect?

KR: I cast a wide net since there are only 19 combined Peds/Genetics residencies in the US that offer 1-2 positions per program. When it came to making my rank list, I prioritized programs that were strong in research and where I could be near family and enjoy living outside of the hospital. My interview days were scheduled along with the Peds PSTP applicants, which were typically two-day interviews, and that meant overall, it decreased the flexibility to schedule some interviews and also that I was on the road most of the time. I was in my first and second trimester while interviewing and am happy that I felt supported and encouraged at my interviews.

AV: What is one of your favorite memories from your time in the MSTP?

KR: Meeting my friend's baby for the first time in the hospital.

Future Plans and Advice to Students:

AV: What are your plans after graduation?

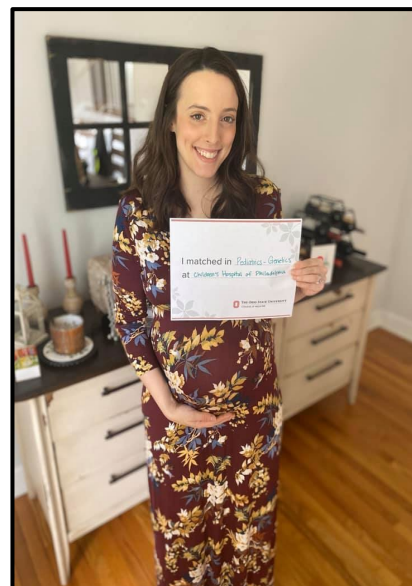
KR: Have a baby in May and move to Philly in June to start Peds/Genetics residency at CHOP.

AV: What are some key lessons or words of wisdom you want to pass along to younger students in the program?

KR: Be forgiving with yourself when things don't work out the way you had planned. Stay connected with MSTP friends over the 7-8 years you're here as you split off in different labs or on clinical different rotations and life gets busy -- you will need them, and they will need you. Soak up any learning experience you can, and approach everything with gratitude.

AV: As you look ahead, how do you see yourself using your MD/PhD training?

KR: I plan to use my MD/PhD training in caring for my patients that may need diagnostic genetic tests on a research basis or may be enrolled in new gene therapy trials. I also plan to stay engaged in research throughout my career.



Kelly Regan-Fendt

Hometown: Villa Park, IL

Undergrad: University of Chicago

Favorite Activity:

Walking around the zoo or public parks

Favorite Restaurant:

Eating my heart's desire at North Market



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MD/PhD Experience:

ASV: In whose lab did you do your PhD, and what did you study?

AV: Dr. Matthew D. Ringel. We elucidated a potential biomarker for Medullary Thyroid Cancer (MTC) clinical prognosis and new therapeutic targets for MTC in-vitro. We showed that reduced RB expression is associated with decreased patient survival independent from patient age at surgery or cancer stage. We also determined that the compound Dinaciclib and the CDK7 inhibitor THZ1 are active against in-vitro naïve MTC cells as well as MTC cells that are resistant to treatment with RET inhibitor Vandetanib. This activity was evident when the compounds were used alone and in combination with Vandetanib. Inhibiting CDK9 or CDK7 affected CDK9 and RET transcription and protein levels, indicating a potential role for transcriptional targeting in MTC treatment and suggesting the possibility of a super-enhancer mechanism regulating CDK9 and RET.



ASV: How did you figure out what specialty you wanted to pursue?

AV: I was always interested in internal medicine, but going through rotations helped solidify that choice. I like the variety of medical issues you have to manage in IM, as well as the in-depth pursue of answers. I also do not particularly enjoy doing procedures, so IM was also a good fit in that regard.

ASV: How did you approach applying to residency, and was there anything about the application/interview process that you did not expect?

AV: I based it on geographic locations of preference, and then programs close by to those. I looked for academic programs with potential for fellowship training and research experiences. I did not expect most interviews to be as casual and conversational as they were, which was a pleasant surprise.

Anisley Valenciaga

Hometown: Havana, Cuba

Undergrad: Florida International University

Favorite Activity: Sit outside in the summer!

Favorite Restaurant: Arepazo (Latin American food)

ASV: What is one of your favorite memories from your time in the MSTP?

AV: Definitely the friendships we built within the program and the memories we created together!

Future Plans and Advice to Students:

ASV: What are your plans after graduation?

AV: Hang out at home with my daughter and husband until residency starts! Then, PSTP training at OSU!

ASV: What are some key lessons or words of wisdom you want to pass along to younger students in the program?

AV: Everything will work out even if it doesn't seem that way at first. Work hard and communicate with your peers and mentors. Enjoy your time in the program as much as you can.

ASV: As you look ahead, how do you see yourself using your MD/PhD training?

AV: Hopefully getting involved with thyroid cancer research in an academic institution. Helping translate questions from the bedside to the bench.



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Student Awards and Achievements

MSTP Leadership and Academic Achievement Awardees:

- Alecia Blaszczyk
- Jerry Cui
- Olga Golubeva
- Kate Hartmann
- Jack Hedberg
- Michael Koenig
- Ellen Lubbers
- Nat Murphy
- Michael Ruesch
- Shane Scott
- Akila Venkataramany
- Kristina Witcher
- Felix Yang

2020 Tau Beta Pi Engineering Honor Society Fellowship Award – Kevin Blum

2020 OSU Biomedical Engineering Dr. Stuart S. and Letitia Roberts Collaborative Research Award – Kevin Blum

2020 Trainee Research Day Travel Award Winner
(MSTP division) – Kylee Daily and Sydney Fobare

American Heart Association Predoc Fellowship – Amanda Huang

2020 American Academy of Neurology student scholarship – Wesley Wang

Recent Student Publications

Hatton H, Gooden S, Heitkeimper M, **Blum KM**, Zakko J, Bocks M, Yi T, Wu YL, Wang Y, Breuer CK, Dasi LP. Fetal Transcatheter Trileaflet Heart Valve Hemodynamics: Implications of scaling on valve mechanics and turbulence. *Ann Biomed Eng.* 2020 Feb 12. PMID: 32052320

Joseph Drews, Victoria Pepper, Cameron Best, Jason Szafron, John Cheatham, Andrew Yates, Kan Hor, Jacob Zbinden, Yu-Chun Chang, Gabriel JM Mirhardari, Abhay B Ramachandra, Shinka Miyaoto, **Kevin M Blum**, Ekene A Onwuha, Jason Zakho, John Kelly, Sharon L Cheatham, Nakesha King, James Reinhardt, Tadahisa Sugiura, Hideki Miyachi, Yuichi Matsuzaki, Julie Breuer, Eric D Heuer, T Aaron West, Toshehiro Shoji, Darren Berman, Brian A Boe, Jeremy Asnes, Mark Galantowicz, Goki Matsumura, Narutoshi Hibino, Allirn L Marsden, Jordan S Pober, Jay D Humphrey, Toshiharu Shinoka, Christopher K Breuer. Spontaneous reversal of stenosis in tissue-engineered Vascular grafts. *Sci Transl Med.* 2020 April 1; 12(537). PMID: 32238576

Bobba, C. A Novel Negative Pressure-Flow Waveform to Ventilates Lungs for Normoterm Ex Vivo Lung Perfusion. *ASAIO Journal* 2020

Misra C, Bangru S, Lin F, Lam K, Koenig SN, **Lubbers ER**, Hedhli J, **Murphy NP**, Parker DJ, Dobrucki LW, Cooper TA, Tajkhorshid E, Mohler PJ, Kalsotra A. Aberrant Expression of a Non-muscle RBFOX2 Isoform Triggers Cardiac Conduction Defects in Myotonic Dystrophy. *Dev Cell.* 2020 Feb 19; pii: S1534-5807(20)30069-1. PMID: 32109384

Alex S Hartlage, Christopher M Walker, Amit Kapoor. Priming of antiviral CD8T cells without effector function by a persistently replicating Hepatitis C like virus. *J Virol.* 2020 May 4; 94(10): e00035-20. PMID: 32102885

Li N, Kalyanasundaram A, **Hansen BJ**, et al. Impaired neuronal sodium channels cause intranodal conduction failure and reentrant arrhythmias in human sinoatrial node. *Nat Commun.* 2020;11(1):512. Published 2020 Jan 24. doi:10.1038/s41467-019-14039-8

Upcoming Events

MSTP Summer Retreat – July 17, 2020

MSTP Recruitment Sessions will be virtual for the 2020-2021 season.

September 15/16, 2020

October 20/21, 2020

December 1/2, 2020

January 12/13, 2021

February 9/10, 2021 (if needed)



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