# COLUMBIA PATHOLOGY AND CELL BIOLOGY REPORT

SUMMER 2018

In Memoriam: **A Tribute to Pat Pringle**

The Body Scientific: **The Ice Volcanoes of Enceladus**

## RETIREMENT:
A State of Being

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**Columbia Pathology and Cell Biology Report**

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**ON THE COVER:** Image of thyroid cell under microscope (Anjali Saqi, MD)

# Looking outward to move upward

Kevin A. Roth, M.D., Ph.D., Chair
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The discipline of pathology is rapidly evolving and our department is responding by pro-actively pursuing new collaborations and opportunities that extend well beyond our traditional scientific and clinical boundaries. The department has a history of forward thinking and strategic investment in new and emerging technology as evidenced by the successful development and maturation of the Personalized Genomic Medicine (PGM) laboratory. At a time when few academic departments of pathology were willing to invest capital in clinical next generation sequencing (NGS) and its uncertain reimbursement, our department made a significant financial commitment to establish a broad array of NGS tests to help guide clinical decision making in an increasingly complex and "personal" approach to patient care. We continue to aggressively expand our NGS testing capabilities and have partnered with the Institute for Genomic Medicine (IGM) to establish a new Precision Genomics Laboratory (PGL) which will further enhance our clinical capabilities and promote new, joint research projects in precision medicine.

The development of the PGM and PGL provides new clinical training opportunities for our residents and fellows and promises to open up exciting new research initiatives for graduate students and faculty alike. As these laboratories have matured, we appreciate the need for further involvement of physicians, scientists, and health care professionals from outside of pathology to be maximally successful. We are now working closely with multiple CUIMC clinical departments and NewYork-Presbyterian Hospital to integrate genetic counselors into PGM and PGL to ensure efficient test utilization and to enhance communication of findings to patients and their physicians so that test results are optimally interpreted and acted upon.

Computational pathology is now emerging as a critical component of academic pathology and clinical practice and we have responded by making major new investments in equipment and personnel to become a recognized leader in this exciting new area. The Digital and Computational Pathology Laboratory (DCPL), under the directorship of Dr. Kevin Gardner, has been established and will soon be fully operational providing initially, extensive digital imaging capabilities for basic and translational research. Ultimately, the DCPL will pursue both clinical and research missions in computational pathology and artificial intelligence. We will also establish close ties with the Human Immune Monitoring Core (HIMC) in the Department of Medicine to develop significant research and clinical programs in precision oncology and immunomodulatory therapies for a variety of diseases. All of these programs will need to be closely integrated with patients' electronic medical records and the system-wide implementation of EPIC.

These are exciting and interesting times in the Department of Pathology and Cell Biology and require the thoughtful prioritization of resources and careful strategic planning. I have been impressed over the three years that I have had the pleasure of being department chair with the grit and determination of our faculty, staff and students and how much we can accomplish when we have a shared vision for success. This spirit extends beyond our departmental borders and we have established superb collaborative and mutually supportive relationships with various Centers, Institutes and Departments and have worked effectively with NYP and outside organizations to expand our clinical and research footprint.

I look forward to working with everyone in the department and all of our colleagues and collaborators outside the department to further enhance our reputation and accomplishments as one of the premier academic departments of pathology in the country. ◆

PHOTOS BY CHARLES MANLEY

## Celebrating 2018 Residents & Fellowship Program Graduation

On Thursday, June 14, 2018, faculty, staff, and friends joined together in the Faculty Club at VP&S for the Residency and Fellowship program's annual graduation reception. Dr. Kevin Roth, Chair and Dr. Charles Marboe, Program Director of the Residency Program, opened up the reception with encouraging words for our graduates to carry with them throughout their careers and personal lives. Program directors got to relive highlights of each trainee's journey as they presented them with their certificates and gifts.

Our chief residents also took this opportunity to present Dr. Tilla Worgall with the 2018 Dr. Joseph G. Fink Laboratory Medicine Faculty Teaching Award and Dr. Armando Del Portillowith the 2018 Award for Excellence in Anatomic Pathology Teaching.

Congratulations to the graduating class of 2018 and our honored faculty!

**Top:** The Graduating Class of 2018
**Top Right:** Charles Marboe, MD (Director of Residency & Fellowship Program) speaking at graduation
**Bottom Right:** Hemepath Fellows posing with Dr. Bachir Alobeid, M.D.
**Left:** Tilla Worgall, MD receiving teacher of the year award

## Incoming 2018 Residents & Fellows

### Joseph Annunziata, M.D.

(Hematopathology fellow) received his MD from the American University of the Caribbean and completed his AP/CP training with the Allegheny Health Network, Department of Pathology and Laboratory Medicine, Pittsburgh, PA.

### Joseph Burt, M.D.

(AP/CP) received his B.A. in Anthropology from Columbia and his M.F.A. in Literature and Writing from Columbia. He worked in publishing in New York City with the Paris Review Literary Journal and with the Levine-Greenberg Literary Agency before entering the post-baccalaureate program at Scripps College. His M.D. is from Albert Einstein College of Medicine where he also completed a one year Montefiore Pathology Fellowship.

### Carleigh Canterbury, D.D.S.

(OP) received her B.S. in Biochemistry from the University of Maryland College Park, and graduated in 2018 with her D.D.S. from New York University College of Dentistry. Her interests include the diagnosis and clinical management of oral mucosal diseases.

### Lanny DiFranza, M.D.

(AP/CP) received his B.A. in Psychology from NYU. Before starting medical school he had extensive experience as a medical assistant in dermatology and hematology practices. His M.D. is from SUNY Downstate.

### Taliya Farooq, MD

(Hematopathology fellow) received her Bachelor of Medicine and Bachelor of Surgery, May 2011, Allama Iqbal Medical College, Lahore Pakistan. Her AP/CP Pathology Residency, was with the Department of Pathology, Westchester Medical Center, Valhalla, NY.

### Igor Katsyv, M.D., Ph.D.

(AP/NP) received his B.A. in Neuroscience from Johns Hopkins and then for two years was a post-baccalaureate fellow at NIH working on glioblastoma tumorigenesis and therapy with John K. Park, MD, PhD. His M.D./Ph.D. is from the Icahn School of Medicine at Mt. Sinai where he worked with Bin Zhang, Ph.D. on novel methods of large-scale data analysis to integrate genomic, epigenomic, transcriptomic and clinical data in breast cancer and gliomas.

### Michael Miller, M.D., Ph.D.

(AP/NP) received his B.S., summa cum laude, in Biochemistry and Integrative Neuroscience from Binghamton University and his M.D./Ph.D. from the Icahn School of Medicine at Mt. Sinai. His research in neuroscience was with the laboratory of molecular neuropsychopharmacology with Yasmin L. Hurd, Ph.D. focusing on neurobiology and the genetics of drug addiction.

## PGM: Study Explores Recent Migration of CPT Codes for Reimbursement of Genomic Tests

**The Journal of Molecular Diagnostics**, in its March 2018 (Vol 20, No. 2) issue, has published an important article by several of our department's faculty and staff.

The article, entitled "The History and Impact of Molecular Coding Changes on Coverage and Reimbursement of Molecular Diagnostic Tests", explores the history of coding and payment for genomic tests in the light of recent changes in Current Procedural Terminology (CPT) coding. Specifically, it discusses the migration of CPT stack codes to tier 1 CPT codes and combined tier 1 and tier 2 CPT codes for reimbursement under the Genome Sequencing Procedures code.

The two examples in this study include T-cell gene rearrangement for leukemia and lymphoma genotyping and a next-generation sequencing (NGS)–based laboratory-developed test for the interrogation of mutations in the genomes of solid tumors. The authors present data demonstrating CPT code changes coupled to both sharp increases in reimbursement rejection rates and decreased absolute payments.

To find out more, read the full text of this article by visiting https://jmd.amjpathol.org/article/S1525-1578(17)30423-3/pdf.

## Incoming 2018 Residents & Fellows

### Austin Shackelford, D.M.D.

(OP) received his B.A. in Classics – Latin Emphasis from the University of Utah and a certificate in Public Health – Dental Emphasis from A.T. Still University, Arizona School of Dentistry and Oral Heath. In 2018 he earned his D.M.D. also from A.T. Still University, Arizona School of Dentistry and Oral Heath. His interests include the diagnosis and clinical management of oral mucosal diseases.

### Jacob Valk, M.D.

(AP/CP) received his B.A. in Biology (Cell and Molecular) with Institutional Honors from Occidental College. His M.D. is from the Sackler School of Medicine – New York State American Branch.

### Gary Wang, M.D., Ph.D.

(CP) received his B.S. and M.Sc. in Biochemistry from the University of Toronto. His M.D./Ph.D. is from P&S where is research with Dr. Stephen Goff on the regulation of retroviral gene expression by cellular transcription factors. He received the Titus M. Coan Prize for Excellence in Research in 2016. He subsequently completed one year of internal medicine residency at Stanford.

### Leslie Wu, M.D.

(AP/CP) received her B.S. in Biology and Chemistry from Brandeis University where she was a member of Phi Beta Kappa. She worked for one year at the Boston Foundation for Sight on a project on neuropathic pain following laser keratorefractive procedures. Her M.D. is from the Chicago Medical School at Rosalind Franklin University of Medicine and Science.

### Joseph Annunziata, MD (Hematopathology fellow)

American University of the Caribbean, Doctor of Medicine, April 2013. Allegheny Health Network, Department of Pathology and Laboratory Medicine, Pittsburgh, PA, Resident physician (AP/CP), 2014-2018.

### Taliya Farooq, MD (Hematopathology fellow)

Bachelor of Medicine and Bachelor of Surgery, May 2011, Allama Iqbal Medical College, Lahore Pakistan. AP/CP Pathology Residency, Department of Pathology, Westchester Medical Center, Valhalla, NY (2014-2018).

### Satoru Kudose, M.D. (Renal Pathology Fellow)

Dr. Kudose received his B.S. from University of Chicago, where he graduated with Honors in Mathematics. He earned his M.D. cum laude from University of Texas Medical Branch, Galveston, TX. He completed Pathology Residency (AP/CP) at Washington University in St. Louis/Barnes-Jewish Hospital.

### Smita Patel, MD

Dr. Patel received her medical degree and underwent residency training in pathology at Saurashtra University in Gujarat, India. Subsequently, Dr. Patel pursued anatomic and clinical pathology residency at Rush University in Chicago, USA, followed by 1-year fellowship in hematopathology at Columbia University Irving Medical Center in New York.

WANT TO CONTRIBUTE TO THE NEXT NEWSLETTER?

Send submissions to PathNews@cumc.columbia.edu

## IN MEMORIAM

# A Tribute to Our Long-time Colleague and Friend: Patricia M. Pringle

**BY JOANN LI** - DEPARTMENT ADMINISTRATOR

Imagine a career that has a profound and lasting impact on how you, and those around you, perform their jobs each and every day. Patricia Pringle began that career in the early 1970s. She was instrumental in transforming the delivery of education, care, and research and served the Department and Columbia for 40 years. Over her career, Pat took on many roles, the first of which began as Dean Sullivan's secretary in the Graduate School of Arts & Sciences. When she joined the Department of Pathology as a Senior Secretary a few years later, it was in the Pathology division for The Sloane Hospital for Women. She became a Divisional Administrator in 1990 and was responsible for OBGYN Pathology and Cytology administration. During her tenure, Pat was appointed to numerous projects and task force committees including bargaining agreement negotiations, quality assurance, billing improvement and revenue enhancement initiatives, and the one project that never ended, computer systems design and implementation for the clinical operations.

In 1985, she helped to conceive and design one of Pathology's first Laboratory Information Systems (LIS). Over the years, she helped develop and implement several LIS, system upgrades, and other software enhancements. Each time, Pat was able to help the Department transition, improve, and adapt to new system technologies, workflow changes, and orchestrate the behind-the-scenes operations refining the user's experience. Pat's commitment and sheer ingenuity led to countless product enhancements, design improvements and increased efficiencies for the Department.

In addition to supporting operations, Pat best demonstrated her depth of knowledge and versatility as our Special Projects Manager. In this role, she contributed to our growth and continuous improvement in every area of clinical operations by leveraging her on-the-job-acquired IT skills with her relentless project management skills. When Pat had an idea for software enhancement, work-flow, or programming improvements, it was she who convinced the vendors and staff how that the systems had the capabilities. Her successes were inspirational and contagious. There were countless times when she enthusiastically presented a system enhancement and demonstrated all of the functionality.

Pat was known not only for her knowledge and expertise but also for her commitment to service and excellence. Our growth in Laboratory Outreach was possible because Pat often worked out customers' unique and idiosyncratic requests for custom reporting and kept track of each individual practice's needs. Pat was a trusted coworker who was generous with her knowledge and mentored many junior colleagues who have followed in her footsteps.

Pat retired in December 2012, but her influence continues to impact those she encountered throughout her remarkable career. Her mark was made in our work and in our hearts. She will always be a part of us.

As a tribute to Pat, Pat's nieces and nephews will be participating in a 5k in August in Pat's honor. The event benefits the Michael J. Fox Foundation for Parkinson's Research where 100 percent of any donation goes to research. Contributions can be made to: https://foxtrot.michaeljfox.org/newyork/PMPMemorial ◆

## Recent Theses Defended

### Darshini Mahadevia

Ansorge Lab, May 9, 2018
"Developmental plasticity and circuit mechanisms of dopamine-modulated aggression"

### Jaime Eberle-Singh

Olive Lab, May 23, 2018
"Leveraging the cell cycle to target pancreatic ductal adenocarcinoma"

### Annie Lee

Polleux Lab, May 23, 2018
"AB42 oligoners trigger synaptic loss through coordinated AMPK-dependent activation of mitochondrial fission and tiophagy"

### John Szymanski

Yuste Lab, May 25, 2018
"Calcium imaging of the entire muscle system of Hydra reeals extensive cellular mutifunctionality"

### Chioma Madubata

Rabadan Lab, June 21, 2018
"Genomic and machine-learning analysis of germline variants in cancer"

### Lyudmila Kovalchuke

Greene and Levy Labs, July 30, 2018
"Regulation of Parkin Protein Levels by L-DOPA"

### Erik Ladewig

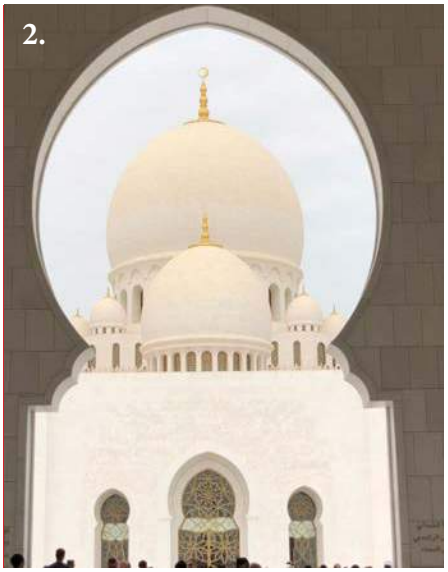
Rabadan Lab, August 14, 2018
"Spatiotemporal genomic architecture reveals Gliblastoma's cellular history"

## Far Flung Travelers

Images taken by Dr. Anjali Saqi during her Spring 2018 trip to Abu Dhabi.

1. Lonely tree in desert

2. Arched beauty



FEATURED ARTICLE

# The ubiquitous, mostly desirable but also feared state of being we call RETIREMENT

**HEIDRUN ROTTERDAM, MD**
Professor Emerita of Clinical Pathology and Cell Biology
Special Lecturer in Pathology and Cell Biology

Photo by Pranam Gurung on Unsplash

Barely a day goes by without some mention of retirement in news media or social interactions. If we are lucky and live long enough, we will all retire at some point. No wonder then that so much attention is paid to an issue that concerns everyone.

My first encounter with the term "retirement" was in first grade when we were asked what the professions of our fathers and mothers were. My parents were both teachers. The question got me thinking about the profession of my grandmother whom I loved a lot and with whom I spent all my vacations. "I am retired" she responded. I took "retired" as a profession and a rather desirable one, since my grandmother was the nicest and happiest person I knew. From then on, whenever I was asked what I wanted to be when I grow up, I proudly replied "retired". People took my answer as a joke, but a joke it was not then and is not now: I am retired.

So what is this ubiquitous, mostly desirable but at times also feared, state of being we call retirement?

Let's start with analyzing the word. Let's dissect it as we dissect a surgical specimen. (In the beginning, there was the word). It is a composite word, tripartite, composed of "re", "tire", and "ment" and all parts are derived from the Latin (In Germany, where I went to high school and medical school, 6 years of Latin were required for admission to medical school, no longer now). "Re" means "back", "tire" (the same as our car tires) means "draw" or "pull" and the ending "ment" denotes a state of mind ("mens"= mind), like in many other abstract terms, such as predicament, amusement, statement etc. Retirement then comes to mean a state of mind characterized by pulling back.

Webster's Unabridged Dictionary offers 6 different meanings of "retire":

**1.** To withdraw to a private, sheltered or secluded place (for example a convent).
**2.** To retreat from danger or battle.
**3.** To move back or seem to do so, as the shore retires to form a bay.
**4.** To withdraw oneself from business, active service, or public life because of advanced age.
**5.** To disappear gradually, as "retiring day" (poetic).
**6.** To go to bed.

After the experience of four years of retirement from the Department of Pathology and Cell Biology at Columbia University, where I spent my last 23 years of a total of 43 years of professional life, I have come to the conclusion that all of these definitions apply in some way to retirement as I see it.

1. "**To withdraw to a private, sheltered or secluded place (for example a convent).**" I had a friend, a pathologist, and a successful one, at the Peter Bent Brigham Hospital in Boston, who indeed retired early to join a convent. I am not that type of person but I can understand the attraction to a "private sheltered place". As I write this, I sit at an old oak table in my solar cabin (a term used by a local painter who found my cabin worth painting, partly because I am the only person in this neighborhood with solar panels on the roof) in a tiny hamlet called Huntersland, in the most northern extension of the Catskill mountains, 155 miles northwest of New York City. There is no public water supply or

Photo by Aaron Ang on Unsplash

sewer system, no internet or cell phone service; but, yes, there is electricity and even a telephone. This is my private, sheltered place where I used to spend one or two weekends a month while I was working and where I now withdraw to for prolonged periods, to hike, to read, to write and just be.

2. "**To retreat from danger or battle.**" This is a serious point for all future retirees. The dangers in our profession are mistakes and malpractice lawsuits. One of our beloved past chiefs who couldn't retire, finally, at the age of 80 years or more, made a mistake and was sued. I remember this event because I took it as a warning: we must go, when we realize we are no longer at our best. We must make room for the next generation. Molecular biology and genetics have revolutionized medicine and especially our specialty, pathology. I was not part of that revolution and never warmed up to it. Time for others to take over.

3. "**To move back, or seem to do so, as the shore retires to form a bay.** " This definition of retirement obviously applies to nature, to the ocean. But as human beings we are part of nature and so I will try to find an application of this definition to human retirement. As we, the retirees, pull back we make space, we allow a bay to form, we allow others to fill it.

4."**To withdraw oneself from business, active service, or public life because of advanced age**." I have trouble with this definition because it neither fits my retirement nor that of most people I know. Most of us remain active in some way, if not full time and maybe not in our accustomed field. I work part time in a private pathology lab in a group practice of gastroenterologists. I would say that counts for active service. And what does "withdraw from public life" mean? Don't we engage in public life when we go shopping? Organize a dinner party? Attend a book club? Participate in voting? And what about the term "advanced age"? Is that 70? 80? 90? 100? As life expectancy changes so do the meanings of certain words. Our supreme justices have no term limits, no age limits. There is no set age limit for practicing physicians, pathologists or other kinds in the US. Although, in Germany, all university-employed physicians have to retire at 65, to make room for the younger generation. Like me, many go into private practice after that, and there is no age limit there.

5. **"To disappear gradually, as "retiring day" (poetic)."** Yes, we gradually disappear, even while we still work. We reduce the intensity of our involvement. We publish less. We lecture less. We attend fewer meetings, fewer conferences. And as we fully retire, we prepare ourselves, consciously or unconsciously, for the inevitable last day. This is not morbid. I remember some philosopher stating that all life is a preparation for death. The awareness and acceptance of our passing provides fuel for the final fulfillment of the many desires we postponed during our active years. Climb the mountain while you can, read the books that fill your shelf before macular degeneration sets in, take the trip to Timbaktu now (I actually signed up for a trip to Bhutan in October). My grandson, when he was 10, asked me when I would die, whether I would ever be 80 years old, or perhaps, would I make it to 100? I said I would try. And what after 100? Then it's really time to go, I said. The world has too many people already, the old really have to go. And what should he do when I die, he continued this memorable conversation. I said, I wanted to be cremated and he and his mother could do with the ashes whatever they wanted. He thought for a while and then, all attention and excitement: I know what I'll do, I build you a tomb. So, in my case it's all taken care of. Just Timbaktu is still waiting (but I am going to Bhutan next month, that may take the place of Timbaktu).

6. **"To go to bed"**. Believe me, this is the best part of retirement: to go to bed with the knowledge that you can sleep as long as you wish. No alarm clock, no hecticly getting dressed, no search for the misplaced keys. Sleeping for seven or eight hours and waking up slowly, all on your own, is the greatest luxury I know. And science seems to agree with my very personal love of sleep: Of the 3 most important activities that maintain good health and good aging - sleep, exercise, and healthy diet - sleep turns out to be the most valuable.

Good night, then, my friends and former colleagues. Enjoy your work and look forward to your retirement! ◆

EVENT SPOTLIGHT

# The 29th Kenneth Naidorf Memorial Lecture

On January 18, 2018, the Department held the 29th Kenneth Naidorf Memorial Lecture. The invited lecturer was Dr. Elaine Fuchs, Ph.D., who is currently the Rebecca C. Lancefield Professor at Rockefeller University.

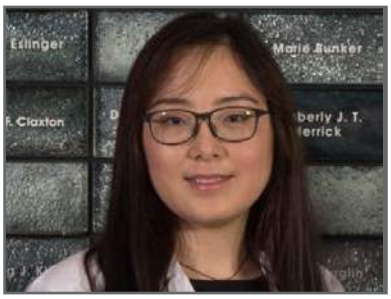
Her lecture entitled "Skin Stem Cells in Silence, Action and Cancer," illuminated her work on the biology of skin stem cells. Her research employs high throughput genomic analyses, live imaging, cell biology, and functional approaches to unravel the molecular pathways that determine the normal balance between stem cell maintenance and differentiation and how this goes awry in cancers. Her team is learning how stem cells establish unique chromatin landscapes and programs of gene expression and how this shifts in response to changes in their local environment. They have found that activating signals from neighboring cells instruct skin stem cells when to make hair and when to repair injuries. Conversely, inhibitory cross talk tells the stem cells when to stop making tissue and rest. This work is accelerating the development of therapeutics to enhance wound repair.

Dr. Fuchs did her undergraduate work at the University of Illinois, and completed her doctoral studies at Princeton University. Following her post-doctoral studies at MIT where she studied keratin genes in the epidermis, she established her own laboratory in the Department of Biochemistry at the University of Chicago in 1980, where she rapidly rose through the ranks to become a full professor in 1989 and the Amgen Professor of Basic Sciences in 1993. She was subsequently recruited by Rockefeller University, where she is currently the Head of the Laboratory of Mammalian Biology and Development. She was also selected to be a Howard Hughes Associate Investigator in 1988 and an Investigator in 1993.

Dr. Fuchs has been the recipient of numerous awards, starting with her selection as a Presidential Young Investigator in 1984 to receiving the National Medal of Science in 2009. She has been elected to the National Academy of Medicine and the National Academy of Sciences. She is also a member of the National Philosophical Society and the American Academy of Arts and Sciences. In addition, Dr. Fuchs has been the recipient of a National Merit Award from the NIH. She is currently an Associate Editor of the Journal of Cell Biology and is on the editorial board of a number of other journals, including Cell, Genes and Development and Developmental Cell. She served as president of the American Society for Cell Biology and is the recipient of the E.B. Wilson Award in 2015 among many others.

The Department of Pathology and Cell Biology's Naidorf Memorial Lecture is sponsored by a generous donation from the Naidorf family in memory of Dr. Kenneth Naidorf who attended Columbia University College of Physicians and Surgeons in the MD-PhD program and received his degrees in 1977. Dr. Naidorf did his doctoral studies investigating the role of macrophages in cellular immunity under the aegis of Dr. Richard Gershon, Professor of Pathology and Director of the Howard Hughes Institute of Immunology at Yale. Results of these investigations have been published in major scientific journals. He was an intern at Waterbury Hospital before completing his residency in internal medicine at the Columbia-Presbyterian Medical Center and was board certified in that specialty in 1980. At the time of the tragic accident that prematurely ended his life and promising career, Dr. Naidorf was Chief Resident in Dermatology at the Yale New Haven Hospital. ◆

Invited lecturer, Dr. Elaine Fuchs (left) with Dr. Michael Gershon, Professor of Pathology and Cell Biology at CUIMC



## Hua Guo, MD, MS

Hua Guo, M.D., M.S., graduated from West China School of Medicine, Sichuan University, China. Dr. Guo was trained in Anatomic Pathology at Peking University First Hospital (which included 18 months of translational research training at MD Anderson Cancer Center), and then completed training in Anatomic & Clinical Pathology at Hofstra Northwell School of Medicine. Most recently, she completed Breast Pathology fellowship training at the University of Texas-MD Anderson Cancer Center. Dr. Guo's clinical responsibilities will be devoted to Breast Pathology, where she will be part of a newly-created Division of Breast Pathology under the direction of Dr. Hanina Hibshoosh.

## Gunnar Hargus, MD, PhD

Gunnar Hargus, M.D., Ph.D. is new Assistant Professor of Pathology and Cell Biology starting July 2018. He earned his MD from Lübeck University, Germany and PhD in Neuroscience from Hamburg University. He completed his residency and fellowship training in anatomical pathology and neuropathology at our department in June 2018. Besides his diagnostic work as a neuropathology attending at our department, he is establishing his own research lab, where he uses human induced pluripotent stem cells to study neural development and to model neurodegenerative diseases such as frontotemporal dementia.

## Simon Sung, MD

Simon Sung, M.D. received his medical degree from Columbia College of Physicians and Surgeons. He completed his anatomic pathology residency at Columbia, his cytopathology fellowship at Cornell, and came back to Columbia for a general surgical pathology fellowship. He is joining the Columbia faculty as a cytopathologist and surgical pathologist.

## Alejandro (Alex) Chavez, MD, PhD

Alejandro (Alex) Chavez did his MD/PhD at the University of Pennsylvania, his residency in Clinical Pathology at Massachusetts General Hospital and postdoctoral studies at the Wyss Institute at Harvard University. His laboratory focuses on building novel technologies to address pressing questions within the areas of neurodegeneration and cancer. Along with his basic research interests Alex is also helping lead our departments efforts to building the next-generation of molecular diagnostics.

## Shana Coley, MD, PhD

Shana Coley received her MD/PhD in Immunology from Emory University in Atlanta, Georgia and worked with Christian Larsen at the Emory Transplant Center. At Columbia University, she completed her residency in Anatomic Pathology in 2013 and her fellowship in Renal Pathology the following year. During her residency and fellowship, she worked with Megan Sykes at the Columbia Center for Translational Immunology on projects related to donor-recipient chimerism in human solid organ transplantation. After her fellowship, she started her own research program at the University of Glasgow, with a joint appointment as a diagnostic Renal Pathologist for National Health Services Scotland. She rejoined Columbia in 2017 as an Assistant Professor of Pathology to continue her research into the impact of tissue resident T cells in human kidney transplantation and holds a clinical appointment in the Division of Renal Pathology.

## Mythily Ganapathi, PhD

Dr. Mythily Ganapathi received her PhD from the Institute of Genomics & Integrative Biology in New Delhi, India. She completed a three-year Clinical Cytogenetics & Molecular Genetics fellowship at the Columbia University Medical center. She joined the Columbia faculty in 2017 as an Assistant director of Cytogenetics Laboratory and the Laboratory of Personalized Genomic Medicine.

## Kevin Gardner, MD, PhD

Dr. Gardner earned both his MD and PhD (in cellular biology and anatomy) at Johns Hopkins School of Medicine. He completed his residency training at the National Cancer Institute and is board certified in anatomic pathology. He joined the Department of Pathology and Cell Biology in 2017 as a Professor and Senior Vice Chair. His lab studies basic mechanisms of epigenetic gene regulation in breast cancer using both model systems and patient derived material. He is also the director of the Digital and Computational Pathology Laboratory (DCPL).

## Amin Ghabrial, PhD

Dr. Ghabrial earned his PhD in Molecular Biology with Trudi Schüpbach at Princeton University, where he worked on dorsal-ventral patterning and double strand DNA break repair in Drosophila and pursued his postdoc work at Mark Krasnow's lab of Stanford University where he carried out a saturation-scale screen for tubulogenesis mutants in the Drosophila trachea.. He joined the department as assistant professor in 2017. His lab uses the Drosophila respiratory system as a model tubular organ. Among his major contributions are pioneering work on the cell biology of making and shaping seamless tubes, and the development of a Drosophila model for the human vascular disease, cerebral cavernous malformations.

## Anne Koehne de Gonzalez, MD

Anne Koehne de Gonzalez, MD earned her undergraduate degree in Linguistics from Cornell University School of Arts and Sciences, and completed her MD at the University of Maryland School of Medicine in 2011. She completed her AP/CP residency and Surgical Pathology and GI/Liver Pathology fellowships at Columbia. She joined the CUIMC faculty as an Assistant Professor in 2017 and divides her time between CUIMC and Lawrence Hospital, involved in both surgical pathology and clinical pathology in transfusion medicine. Her research interests include congestive hepatopathy and pancreatobiliary cancers.

## Jun Liao, PhD

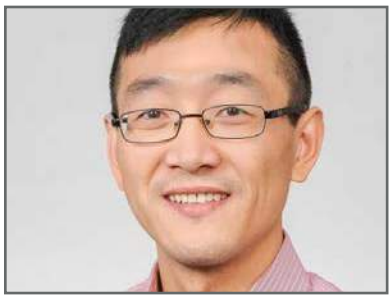
Jun Liao, Ph.D., FACMG is an Assistant Professor in the Department of Pathology and Cell Biology at the Columbia University Irving Medical Center. He also serves as the Director of Constitutional Cytogenetics in the Clinical Cytogenetics Laboratory of the NewYork Presbyterian Hospital. Dr. Liao received his Ph.D. in Molecular Genetics from the Albert Einstein College of Medicine, and is certified in Clinical Cytogenetics and Clinical Molecular Genetics by the American Board of Medical Genetics and Genomics. Before coming to Columbia, he was an assistant professor and a lab director in the Department of Genetics and Genomic Sciences at Icahn School of Medicine at Mount Sinai.

## Carlos Pagan, MD

Carlos Pagan received his MD from the University of Puerto Rico School of Medicine in 2011 and completed his residency in Anatomic and Clinical Pathology at Weil-Cornell Medical Center in 2015. He later trained in Molecular and Genetic Pathology at Memorial Sloan-Kettering Cancer Center, graduating in 2016, and afterwards joined the Department as a surgical pathology fellow. In 2017 he joined the faculty at CUMC as an Assistant Professor where he spends his time between clinical work in surgical pathology and PGM.

## David Park, MD

Dr. Park is a academic board-certified hematopathologist with clinical research interests in aggressive myeloid and lymphoid neoplasms. Before joining CUMC, he was a staff member at Memorial Sloan-Kettering Cancer Center for five years after completing his residency and fellowship training at the Brigham and Women's Hospital in Massachusetts. He lives in Jersey City with his wife and son.



## Yueqing Peng, PhD

Yueqing Peng, PhD is an Assistant Professor in the Department of Pathology and Cell Biology and a faculty member in the Institute for Genomic Medicine at Columbia University. Prior to his faculty appointment, as a postdoc Yueqing worked in the laboratory of Dr. Charles Zuker to study the neurobiology of taste. In his own lab, Yueqing and his team are building an independent research program in the neurobiology of sleep. Currently they are searching molecules, cells and circuits involved in sleep and sleep disorders. In collaboration with faculty members at CUIMC, Yueqing is also interested in the study of genetic mouse models of epilepsy and related neuropsychiatric disorders. In the long run, he aims to apply the knowledge of sleep biology to study the relationship between abnormal sleep and mental illness.

## Craig Soderquist, MD

Dr. Soderquist received his MD at the Columbia University Vagelos College of Physicians and Surgeons. Between his third and fourth years of medical school, he completed a one-year research fellowship in the lab of Dr. Peter Canoll. He spent the next six years at the University of Pennsylvania where he completed a four-year anatomic and clinical pathology residency, followed by fellowships in hematopathology and molecular genetic pathology. He joined the Columbia faculty in 2017 with appointments in the divisions of hematopathology and personalized genomic medicine.

## Andrew Yates, PhD

Andrew Yates, PhD joined the department in 2017 as a Professor of Pathology and Cell Biology. His research integrates theoretical and computational tools with more traditional experimental approaches to study the population dynamics of T and B cells. His lab focuses particularly on the evolution of immune repertoires throughout an individual's lifespan, and their recovery in HIV-infected individuals following antiretroviral therapy.

## George Zanazzi, MD, PhD

George Zanazzi received his MD/PhD from Stony Brook University and completed his residency training in Anatomic Pathology and Neuropathology at Columbia. During the last year of his residency, he focused on muscle and nerve pathology under the supervision of Dr. Kurenai Tanji. As an attending, his clinical responsibilities include the general neurosurgical pathology service, muscle and nerve pathology, and autopsy. He is interested in understanding the complex interactions between tumors and the nervous system in order to devise novel therapeutic strategies for cancer patients. In addition, he is interested in applying computational tools to assist in the diagnosis of neurological disorders.

# Carol Mason Elected to National Academy of Sciences

On May 1, 2018, the National Academy of Sciences announced the election of 84 new members and 21 foreign associates, in recognition of the distinquished and continuing achievements in original research. Dr. Carol Mason, PhD, Professor of Departments of Pathology and Cell Biology, Neuroscience, and Ophthalmology, is among the newly elected members.

Membership in the National Academy of Sciences is considered a symbol of scientific excellence. The National Academy of Sciences is a private, nonprofit institution that was established under a congressional charter signed by President Abraham Lincoln in 1863. It recognizes achievement in science by election to membership, and — with the National Academy of Engineering and the National Academy of Medicine — provides science, engineering, and health policy advice to the federal government and other organizations.

"Dr. Mason is an outstanding scientist, educator, and academic leader," says Kevin A. Roth, MD, PhD, chair of the Department of Pathology & Cell Biology and the Donald W. King, M.D. and Mary Elizabeth King Professor of Pathology and Cell Biology. "Her commitment to high-quality and creative research, performed in a supportive collaborative environment, is an inspiration to everyone in the department and the medical school. I can think of no one more deserving of this honor."

Mason studies the brain circuitry of the visual system, focusing on how neurons in the developing brain extend axons from the eye to destinations deep in the brain. Her research has helped to reveal the processes that guide the growth and trajectory of the visual system's neurons—opening up the possibility of repairing damage to the visual system caused by injury or disease.

Dr. Mason is also a member of the National Academy of Medicine (elected in 2011), the American Association for the Advancement of Science (elected in 2006), and a Simons Foundation Senior Fellow. As one of the world's leading authorities on the development of the mammalian visual system and cerebellum, she focuses on investigating the role of transcriptional regulators and guidance mechanisms that determine how these connections are formed. She has served as a co-director of the Doctoral Program in Neurobiology and Behavior, and the Vision Sciences Training Program. She was president of the Society for Neuroscience from 2013 to 2014 and is currently a member of the NIH BRAIN Initiative's Multi-Council Working Group and the National Eye Institute's Advisory Council. She is currently a principal investigator and chair of Interschool Planning, in Columbia's Zuckerman Institute.

Dr. Mason has received numerous awards during her career, including the Mika Salpeter Lifetime Achievement Award (2017) from the Society for Neuroscience; the Champalimaud Vision Award (2016) from the António Champalimaud Foundation; and the Stevens Triennial Prize (2013) from the Vagelos College of Physicians and Surgeons.

Congratulations again to Dr. Mason on her much distinguished and well-derserved achievement. ◆

## Honors & Awards

**Lorraine Clark, Ph.D.**, **Carol Troy, M.D., Ph.D.**, and **Ai Yamamoto, Ph.D.**, awarded Mouse Genome Editing Subsidy Awards by The Columbia Precision Medicine Initiative.

**Christopher Lawrence De Jesus** honored for Professional Excellence by the American Sociery for Clinical Pathology (ASCP)

**Swarnali Acharyya, Ph.D.**, wins Columbia Biomedical Technology Accelerator for "Microchip With Tumor-Organoid-and-Blood-Vessel to Screen Drug Efficacy and Toxicity"

**Harris Wang, Ph.D.**, named 2018 Schaefer Research Scholar (VP&S) - "Systematic Dissection of Xenobiotic Metabolism by the Gut Microbiome"

**Vivette D'Agati, M.D.** 2018 Inductee to the Virginia Apgar Academy of Medical Educators (VP&S)

**Vivette D'Agati, M.D. and Kathleen O'Toole, M.D.** 2018 Inductees to VP&S Academy of Clinical Excellence (ACE)

**Marianne Wolff, M.D.** awarded the 2018 VP&S Distinguished Service Award in the Basic Sciences

**Joseph Schwartz, M.D.**, the recipient of 2019 American Association of Blood Banks (AABB) Hemphill-Jordan Leadership Award

**Stephen Tsang, M.D.**, winner of the 2018 Macula Society Young Investigator Award

**Osama Al Dalahmah, M.D.** wins 2017 Shelanski Research Innovation Award in Pathology

**Anna Lasorella, Ph.D.** wins the Inaugural Data Science Institute (DSI) Seed Funds Program Award

**Paulette Bernd, Ph.D.** awarded the 2018 Charles W. Bohmfalk Award for Distinguished Contributions to Teaching in the Pre-Clinical Years (VP&S)

**Julie Canman, Ph.D.** awarded 2018 Harold and Golden Lamport Award for Excellence in Basic Sciences Research (VP&S)

**Tilla Worgall, M.D.** recipient of the 2018 Joseph G. Fink Laboratory Medicine Faculty Teaching Award (VP&S)

**Armando Del Portillo, M.D.** winner of the 2018 Award for Excellence in Anatomic Pathology Teaching (VP&S)

**Anjali Saqi, M.D. and Vivette D'Agati, M.D.** chosen as 2018 NewYork Magazine's Best Doctors

## Faculty Promotions (since 2017)

Promoted to Professor

**Peter Canoll, M.D., Ph.D.** - Professor of Pathology and Cell Biology at CUIMC
**Thomas Diacovo, M.D.** - Professor Emeritus of Pediatrics and Pathology and Cell Biology
**Laura Pasqualucci, M.D.** - Professor of Pathology and Cell Biology (in the Institute for Cancer Genetics) at CUIMC
**Patricia Tiscornia-Wasserman, M.D.** - Professor of Pathology and Cell Biology at CUIMC
**Alexander Kratz, M.D.** - Professor of Pathology and Cell Biology at CUIMC
**Jorge Sepulveda, M.D.** - Professor of Pathology and Cell Biology at CUIMC
**Patrice Spitalnik, M.D.** - Professor of Pathology and Cell Biology at CUIMC
**Gloria Su, Ph.D.** - Professor of Pathology and Cell Biology (in Otolaryngology/Head and

Promoted to Associate Professor

**Julie Canman, Ph.D.** - Associate Professor of Pathology and Cell Biology
**Helen Fernandes, Ph.D.** - Associate Professor of Pathology and Cell Biology at CUIMC
**Diane Hamele-Bena, M.D.** - Associate Professor of Pathology and Cell Biology at CUIMC
**George Mentis, Ph.D.** - Associate Professor of Pathology and Cell Biology (In Neurology)
**Helen Remotti, M.D.** - Associate Professor of Pathology and Cell Biology at CUIMC
**Tilla Worgall, M.D.** - Associate Professor of Pathology and Cell Biology at CUIMC
**Ai Yamamoto, Ph.D.** - Associate Professor of Neurology and Pathology and Cell Biology
**Shan Zha, M.D., Ph.D.** - Associate Professor of Pediatrics and Pathology and Cell Biology (in the Institute for Cancer Genetics and in the Herbert Irving Comprehensive Cancer Center)
**Xin Zhang, Ph.D.** - Associate Professor of Ophthalmic Science (in Ophthalmology and in Pathology and Cell Biology)

## 2018 Faulty Honors and New Faculty Welcome Reception

On July 25, 2018, Dr. Kevin Roth, chair of the Department of Pathology and Cell Biology, hosted the third Faculty Honors and New Faculty Welcome Reception in the John Fenoglio Library at PH15-1560.

Since Dr. Roth joined the Department in 2015, he has made clear his intention to applaud our faculty and the amazing work they do throughout the year. Our wonderful faculty win awards, honors, grants and promotions that deserve to be recognized by the Department.

## New appointment for Dr. Alexander Kratz

Congratulations to Dr. Alexander Kratz, M.D., Professor of Pathology and Cell Biology at CUIMC, for his new appointment as the Medical Directoy of the CUIMC **All of Us** Research Program and of the local CUIMC Biobank.

# The Ice Volcanoes of Enceladus

## Or what a lens can do

**BY RICHARD H. KESSIN, PHD**
Emeritus and Special Lecturer,
Pathology and Cell Biology

Not so many years ago, as part of our writing program, I was advising PhD students at Columbia about essays for National Science Foundation fellowships. These are generous fellowships—and hard to get, so the applications have to be carefully prepared. The NSF people had specific questions for applicants and one of them was "what event, when you were young, helped to ignite your interest in science?" Five students wrote about the baking powder-vinegar papier-mâché volcano in 4th grade. Fair enough, it was a staple of my youth too, but I suggested they think of something else; reviewers get tired of the same example in every essay. "How about The Ice Volcanoes of Enceladus?" a student asked. 'The what?' I said. "No kidding, it's a real thing." She was right—if you have a grade school child, let them type Enceladus into Google. They (and you, I hope) will land on the website of NASA's Cassini Mission to Saturn, which presents an engineering and scientific marvel, and is also an artistic tour-de-force. Imagine a camera lens sent hundreds of millions of miles into space on a satellite that could send back astonishing pictures for years. Imagine being one of the people who works on that project.

About 400 years ago, telescopes and then microscopes engaged some of the greatest minds of the17th century: Galileo, Descartes, Newton, Spinoza, Van Leeuvenhoek, Hooke, and many others. They all ground lenses or studied optics. Their discoveries could get them in trouble: Galileo with Pope Urban VI, who threw him into house arrest; René Descartes, driven out of Paris for challenging Catholic authority, and the philosopher Baruch Spinoza, excommunicated from the Jewish community of Amsterdam for challenging the authorship of the Hebrew Bible.

Antoni van Leeuvenhoek and Robert Hooke are credited with the first microscopes. Every time van Leeuvenhoek or Hooke looked through a microscope they saw creatures that had never been seen before—sperm, rotifers, amoebae, bacteria, tiny plants, algae, water fleas. The drawings were published by the Royal Society, of which Hooke was one of the founders. The first book, Hooke's Micrographia, sold out the first day it was available, in 1665. It was an exciting time in science and art, which were not considered separate subjects, but rather parts of the same creative spirit of enquiry. Van Leeuvenhoek lived across the main square in Delft from Johannes Vermeer, who was bending and manipulating light to project images for his paintings, which I learned from art historian Laura J. Snyder's book, Eye of the Beholder.

The point of this preamble is that primary school children are naïve observers, not so different from those in the 17th century who first looked into pond water or many other odd places. To see an unexpected universe, celestial or microscopic, engages a child. Let them channel van Leeuvenhoek and Hooke. They will have the advantage of better microscopes and attached cameras, but the experience will be essentially the same as the first investigators in the 1650s. Let's not separate art and science, at least for young children. Astonishment is the goal; all the rules, regulations, clever questions and experiments, all the subtleties of science and art can come later.

Not having had a third grader around for some time, I went to see Lauren Valentino, Principal of the Botelle School in Norfolk CT. She was in the midst of a small crisis—there had been a windstorm and fallen trees blocked some bus routes so she was calmly making sure that all the kids got home. We chatted for a while and Mrs. Valentino explained that there were new Next Generation Science Standards, produced under the auspices of the National Academy of Sciences https://www.nextgenscience.org/. I am now about a fifth of the way through the 500 or so pages. Here is part of the Introduction:

*Within the Next Generation Science Standards (NGSS), there are three distinct and equally important dimensions to learning science. These dimensions are combined to form each standard—or performance expectation—and each dimension works with the other two to help students build a cohesive understanding of science over time.*

I don't know what it means, but OK. Does a microscope ever appear? Do the kids ever go out and look at frog eggs or pond scum? Not, Mrs. Valentino told me, through sixth grade. Do I have a modest proposal to change this is some small way? Well, yes. Let's see in part t of this series. ◆

**"It was an exciting time in science and art, which were not considered separate subjects, but rather parts of the same creative spirit of enquiry"**

# Second Annual International "Skype Project" Conference

On Sunday, January 21, 2018, the Department of Pathology and Cell Biology hosted its second virtual international student conference (the “Skype project” conference) in the Hammer Health Sciences Library.

Medical and dental students from Canada (McGill University, Montreal), Germany (Martin Luther University, Halle), Finland (University of Helsinki, Helsinki), Japan (Kyoto University, Kyoto), Taiwan (National Taiwan University, Taipei), and the US (Vagelos College of Physician and Surgeons, and the College of Dental Medicine), met as part of the "Skype project" for final data presentations.

The “Skype Project” is an international exchange program for junior medical and dental students, and is based in the Anatomy course at P&S. This year, 110 students from 6 countries participated - including 27 CUMC students (first year VP&S and CDM students). The students meet online throughout the fall semester in 20 small groups, and work on selected topics covering Anatomy, death, differences in healthcare systems, healthcare education, public health, and health ethics.

This year’s international conference involved 91 participants – including 25 CUIMC students. Initially, student representatives from each nation introduced their countries in the cultural exchange portion of the conference. Subsequently, the small group work culminated with final group presentations.

This summer selected P&S and CDM students travel abroad for summer research internships at the international partner schools. Also, VP&S is hosting 10 international visiting students this summer – three in the Pathology and Cell Biology Department. ◆

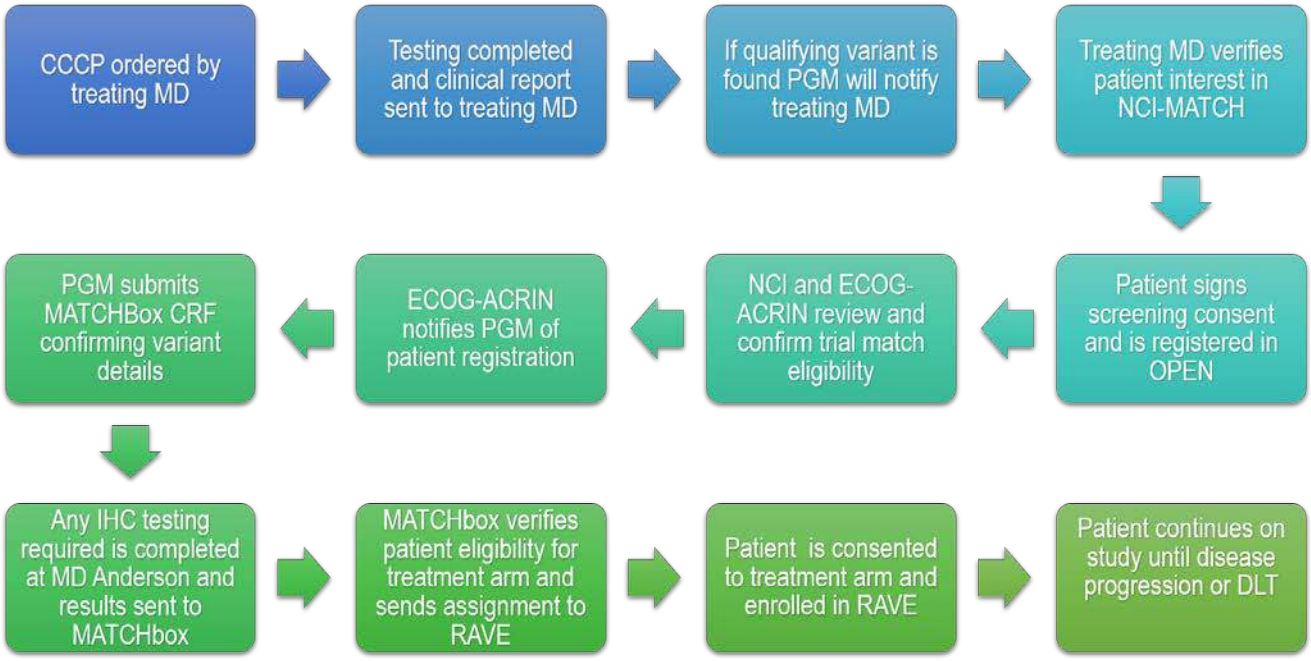
The image above shows some of the participating CUIMC students, along with Anatomy faculty Dr. Paulette Bernd and Dr. Anette Wu, as well as Anthony Pizziatolla and Eric Dillalogue from the Hammer Library. In the background are screenshots of the participating international students and supporting faculty.

Columbia University's Personalized Genomic Medicine Laboratory (PGM) in the Department of Pathology & Cell Biology is proud to announce that it has been selected to participate as a CLIA-certified laboratory for the NCI-Molecular Analysis for Therapy Choice (NCI-MATCH) precision medicine trial. NCI-MATCH was co-developed by the ECOG-ACRIN Cancer Research Group (ECOG-ACRIN) and the National Cancer Institute (NCI) and is being led by ECOG-ACRIN through its Biomarker Sciences Program. NCI-MATCH, also known as EAY131, is the largest trial to date that seeks to determine whether therapies targeting specific gene mutations will be effective regardless of cancer type. Tumor gene testing by a designated lab is the only pathway for patients to enroll in the trial.

Under the terms of this new collaboration, when Columbia Combined Cancer Panel (CCCP) testing is ordered as part of a patient's standard clinical care, and it identifies a qualifying genetic alteration abnormality (such as a mutation or amplification), PGM will notify the treating physician of the possible qualifying genetic alteration. If the treating physician and the patient are interested in participating in the NCI-MATCH study, NCI and ECOG-ACRIN trial leaders will centrally review PGM's trial match. If they verify the referral, they will formally assign the patient to the treatment arm.

To read a summary of the process, visit http://ecog-acrin.org/nci-match-eay131-designated-labs. Patients with advanced solid tumors, lymphomas, or myeloma may be eligible for MATCH, once they have progressed on standard treatment for their cancer or if they have a rare cancer for which there is no standard treatment. There are several treatment arms that are open to patients at any given time, for current trial availability please visit http://ecog-acrin.org/trials/nci-match-eay131.

## CUIMC NCI-MATCH SCHEMA




## Useful Information

**Updating online faculty profiles** – Faculty members can update their online profiles at http://columbiaprofiles.org/ or by emailing PathWebMaster@columbia.edu. Regularly updating your profile is strongly encouraged.

**Updating website content** - If you find any outdated, incorrect, or missing content on our department website (www.pathology.columbia.edu), and would like to have it updated, please contact PathWebMaster@columbia.edu.

**Posting images on touchscreen directories** - If you have interesting images (research, events, people, celebrations, etc.) that you wish to post on our three touch-screen directories located near the main elevators of the P&S and PH buildings, please contact PathNews@cumc.columbia.edu

# GRANTS AWARDED (SINCE JUNE 2017)

| PI | Sponsor | Title |
|---|---|---|
| Abate-Shen, Cory | National Cancer Institute | Preclinical analyses of Advanced Prostate Cancer in Genetically Engineered Mice |
| Au, Edmund | Irma T. Hirschl Trust | Spatiotemporal Mapping of Cortical Interneuron Tangential Migration |
| Batal, Ibrahim | American Society of Transplantation | The Clinicopathologic Significance of Graft Dendritic Cells and Ischemia-reperfusion Injury in Kidney Allograft Inflammation and Outcome |
| Canoll, Peter | National Institute of Neurological Disorders and Stroke | Developing motor-neuron driven reporter induced pluripotent stem cells (iPSC) lines |
| Canoll, Peter | American Epilepsy Society | Fine-scale mapping of electrophysiological and cellular alterations in a mouse model of tumor associated epilepsy |
| Chavez, Alex | The Burroughs Wellcome Fund | Novel Technologies and Their Application to Neurodegenerative Diseases |
| Causton, Helen | Life Sciences Research Foundation | Integrated Approach to Temperature Compensations in Biological Oscillations |
| Cremers, Serge | Waters Technologies Corporation | Precision Medicine Guided Pharmacotherapy at Columbia - Drug Level Monitoring in collaboration with Waters Corp. |
| Dalerba, Piero | Breast Cancer Alliance, Inc. | The role of SOX10 as a predictor of survival outcomes in familial breast cancer patients |
| Sepulveda, Antonia | American Society of Transplantation | The Clinicopathologic Significance of Graft Dendritic Cells and Ischemia-reperfusion Injury in Kidney Allograft Inflammation and Outcome |
| Duff, Karen | National Institute on Aging | Propagation of Tauopathy: Impact on Cellular Pathways In Vivo and In Vitro |
| Gershon, Michael | National Institute of Neurological Disorders and Stroke | Microenvironment in Enteric Neuron Development |
| Greene, Lloyd | National Institute of Neurological Disorders and Stroke | Neuron Death in Parkinson's Disease: The Role of Trib3 |
| Gu, Wei | National Cancer Institute | p53 Acetylation in Ferroptosis and Tumor Suppression |
| Guardia Laguarta, Cristina | Fox (Michael J.) Foundation for Parkinson's Research | Phosphatidylethanolamine metabolism alteration in Parkinson disease: a novel mitochondrial biomarker |
| Gundersen, Gregg | National Cancer Institute/NIH/DHHS | Mechanical regulation of breast cancer cell nuclei by the LINC complex |
| Haeusler, Rebecca | National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS | Bile acids and insulin sensitivity |
| Haeusler, Rebecca | American Diabetes Association | Neurocognitive Effects of Iron Deficiency in Blood Donors |
| Hod, Eldad | National Heart, Lung, and Blood Institute/ NIH/DHHS | Neurocognitive Effects of Iron Deficiency in Blood Donors |
| Kim, Tae-Wan | Cure Alzheimer's Fund | Novel Chemical Modulators for BACE1-Mediated Cleavage of β-Amyloid Precursor Protein |
| Liem, Ronald | Charcot-Marie-Tooth Association | Reversal of neurofilamentous accumulations for treatment of CMT2E |

| PI | Sponsor | Title |
|---|---|---|
| Mentis, George | National Institute of Neurological Disorders and Stroke | "Mechanisms of Central Synaptic Dysfunction in SMA" in a competitive renewal |
| Monani, Umrao | National Institute of Neurological Disorders and Stroke/NIH/DHHS | Spinal muscular atrophy: Mechanisms and treatment strategies |
| Monani, Umrao | Cure SMA | SMA modulators as a means to revealing disease mechanisms |
| Myeku, Natura | Biogen Idec | Developing motor-neuron driven reporter induced pluripotent stem cells (iPSC) lines |
| Pon, Liza | National Institute of Neurological Disorders and Stroke | Modeling enteric nervous system development and Hirschsprung's disease in human pluripotent stem cells |
| Qiang, Li | National Institute of Neurological Disorders and Stroke | Mechanism of regulation of progenitor proliferation and transformation |
| Siegelin, Markus | Whitehall Foundation, Inc. | Investigating the role of Wnt Signaling in Subpallial Lineage Specification |
| Sparrow, Janet | National Eye Institute | Retinal Disease Promoted by Iron-Induced Bisretinoid Oxidation |
| Spitalnik, Steven | National Heart, Lung, and Blood Institute/ NIH/DHHS | Mechanisms Underlying Impaired Bacterial Clearance Following Transfusion of Stor-age-Damaged Red Blood Cells |
| Tabas, Ira | National Heart, Lung, and Blood Institute | CaMKII/MK2 Signaling in Cardiometabolic Disease |
| Tabas, Ira | National Institute of Diabetes and Digestive and Kidney Diseases | TAZ and YAP in Non-alcoholic Steatohepatitis and its Complications |
| Troy, Carol | EI Pharma | Kairos Ventures |
| Tsang, Stephen | Aclcon Research Institute | CRISPR single-nucleotide polymorphism (SNP) editing for autosomal dominant disorders |
| Vlad, George | Pfizer | Research Project |
| Wichterle, Hynek | National Institute of Neurological Disorders and Stroke | "Motor Neuron Selector Genes and Mecha-nism of their Action" in a competitive renewal |
| Wichterle, Hynek | National Institute of Neurological Disorders and Stroke/NIH/DHHS | Defining the transcriptional regulation of motor neuron maturation in vivo and in vitro |
| Wichterle, Hynek | Project A.L.S. | Evaluation and optimization of alsterpaullone as a therapeutic agent for ALS |
| Worgall, Tilla | EI Pharma | Kairos Ventures |
| Yamamoto, Ai | National Institute of Neurological Disorders and Stroke | Identification of the Initial Cellular Site of Action of β-Synuclein in the Pathogenesis of Parkinson's Disease in vivo |
| Zha, Shan | National Cancer Institute | The Catalytic and Non-catalytic Functions of PARP1 in Cancer |
| Zeltser, Lori | Functional Mapping of Arginine Vasopressin Receptor 1A Circuits That Promote Anorexic Behavior | Functional Mapping of Arginine Vasopressin Receptor 1A Circuits That Promote Anorexic Behavior |

# Pathology and Cell Biology

## SEMINARS

**September 6**
*Ansuman Satpathy, MD, PhD*
Stanford University, School of Medicine

**September 17**
*Adam Hughes, PhD*
The University of Utah

**September 20**
*Kenneth Olive, PhD*
Columbia University Irving Medical Center

**September 24**
*Xiang Yu, PhD*
Senior Investigator
Shanghai Institutes for Biological Sciences,
Institute of Neuroscience
Shanghai, China

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