Winter 2019 • Inaugural Edition

DNA Pitt Crew

The latest news and updates from the UPMC Hillman Cancer Center Genome Stability Program

University of Pittsburgh

UPMC | HILLMAN CANCER CENTER

Note from the Genome Stability Program Co-leaders, Patricia Opresko, PhD, and Bennett Van Houten, PhD

Due to the growing strength of research programs studying DNA repair pathways and cellular responses to DNA damage across the campus of the University of Pittsburgh (the DNA Pitt crew), UPMC Hillman Cancer Center designated in the Genome Stability Program (GSP) as one of the key fundamental science programs within Hillman in 2018-2019. We are proud to provide leadership to this outstanding team of highly collaborative scientists. The goals of the GSP are to: 1) gain new insights into the molecular pathways that maintain genome integrity; 2) understand how these processes are altered in cancer cells; and 3) exploit deficiencies in DNA repair in tumor cells to develop new therapeutic approaches. Fundamental research provides a valuable source of novel targets and strategies for cancer diagnosis, treatment, and prevention. Our work encompasses state-of-the-art approaches spanning molecules, mice, and humans to understand, diagnose, and treat cancer. The major research themes include Genome Stability, Radiation Biology, Genotoxic Stress Responses, and Aging and Cancer. This inaugural edition of our newsletter provides information about our members, recent recruits, and some of the exciting science emanating from this team. We look forward to using this twice-yearly forum to highlight some of the recent activities and accomplishments within the GSP.

Faculty Spotlight — Kara Bernstein, PhD

Kara Bernstein, PhD, is an Associate Professor in the Department of Microbiology and Molecular Genetics at the University of Pittsburgh. She was recruited to UPMC Hillman Cancer Center in 2011 after completing a highly productive postdoctoral fellowship with Rodney Rothstein, PhD, at Columbia University. She received her PhD in Genetics at Yale University. Dr. Bernstein has been continuously funded since joining the faculty in the Genome Stability Program, and during the past year, she has received numerous awards and honors in 2018 including "Trailblazer" Honoree at the UPMC Ladies Hospital Aid Society Annual Gala. Dr. Bernstein was featured on NBC WPXI "Our Region's Business," and was the recipient of the Emerging Female Scientist Award from the Carnegie Science Center. Dr. Bernstein is the recipient of a subcontract of a newly funded NCI R01 grant entitled "Mechanisms of genome instability induced by APOBEC cytidine deaminases and their impacts during cancer development" with Steven Roberts, PhD, of Washington State University. She was an invited speaker at several international symposia, including the Biennial Ovarian Cancer Research Symposium in Seattle, Wash.; Outstanding New Environmental Scientists (ONES) Awardee Symposium in Research Triangle Park, N.C.; and Gordon Research Conference on DNA Damage, Mutation and Cancer in Ventura, Calif. The Bernstein lab studies how double-strand breaks in DNA, one of the most lethal types of DNA lesions, are repaired. Repair of DNA damage is crucial to prevent accumulation of mutations that can cause genomic instability, aging, and cancer. By understanding the mechanism of double-strand break repair and the role of DNA repair proteins in this process, her research team hopes to uncover mechanisms of tumorigenesis and cancer progression. This knowledge will aid in diagnosis/prognosis of different types of cancers to find novel therapeutic targets for these patients.

Inside this issue:

Contact Us:

For more information about the GSP, please contact:
Patty Opresko, PhD - plo4@pitt.edu
Ben Van Houten, PhD - vanhoutenb@upmc.edu

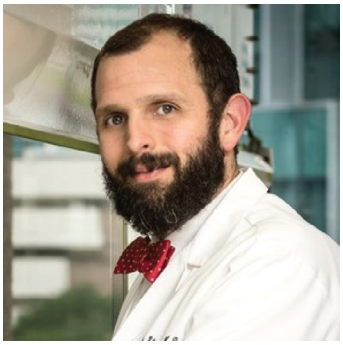
Left to right: Dr. Patricia Opresko, Professor, Department of Environmental and Occupational Health, Graduate School of Public and Health and Dr. Elise Fouquerel, Assistant Professor at Thomas Jefferson University

Trainee Spotlight — Elise Fouquerel, PhD

Congratulations to Elise Fouquerel, PhD, a former postdoc in Dr. Patty Opresko's lab, on her new faculty position of Assistant Professor in the Department of Biochemistry and Molecular Biology at Thomas Jefferson University effective December 1, 2018. During her postdoctoral studies at UPMC Hillman Cancer Center, Dr. Fouquerel was awarded a K99/R00 award in 2016. The gold standard among individual trainee research grants is the K99/R00 Pathway to Independence Award (affectionately called the "Kangaroo Grant"), which funds two final years of postdoctoral fellowship training plus up to three additional years as a newly appointed tenure-track faculty member. Individuals who receive these prestigious grants (less than 250 are awarded throughout all of the biomedical sciences each year) are particularly well positioned for successful academic careers. Since arriving at Hillman, Dr. Fouquerel has published multiple papers with Dr. Opresko and former Hillman faculty member Robert Sobol, PhD, with several appearing in well-regarded, high-impact journals. Although we are sad to see her go, we are delighted that her future accomplishments (and we expect there will be many) will forever be a part of Hillman's training legacy.

Meet Our New Faculty

Meet Heath Skinner, MD, PhD



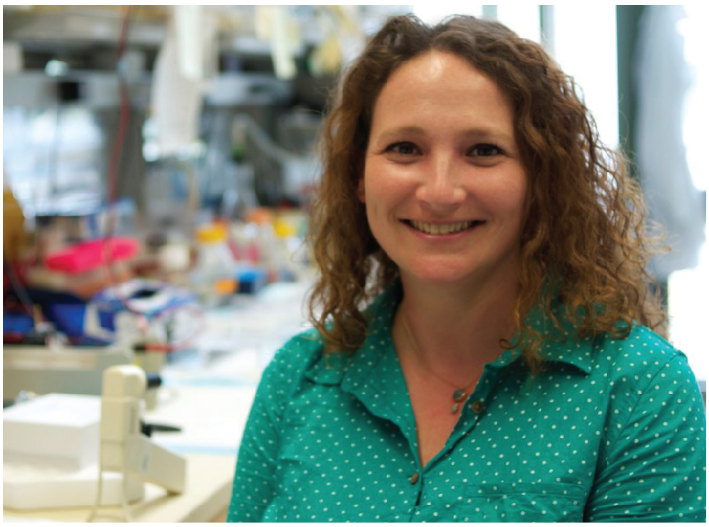
Heath D. Skinner, MD, PhD, is a Visiting Associate Professor of Radiation Oncology at the University of Pittsburgh and specializes in the study and treatment of head and neck and lung cancer. He is a board-certified radiation oncologist as well as a physician-scientist. Dr. Skinner maintains an active, translational research laboratory focused upon identifying novel, clinically targetable biomarkers of resistance to radiation. His group utilizes "big data" approaches to clinical specimens as well as in vivo screening techniques to generate novel targets for study. These targets are then further investigated in vitro, to elicit insights regarding mechanisms of radioresistance. Dr. Skinner's research is designed to generate insights that lead to the rational design of clinical trials using agents that are currently under investigation to minimize the time from bench to bedside. Dr. Skinner completed a combined MD/PhD program at West Virginia University. During that time, Dr. Skinner was involved in an international, multi-institutional, randomized trial through the NRG, which completed accrual in late 2016. Over the course of his career, Dr. Skinner has received eight peer-reviewed grants, including a current R01 (R01CA168485) funding his research. He has published more than 90 peer-reviewed articles in journals such as *Nature Cell Biology, Cancer Cell, Onco-gene, Cancer Research,* and *Clinical Cancer Research.* In addition, he has written six book chapters and nine invited reviews and presented more than 50 abstracts at national meetings. Dr. Skinner has also been invited to present his work at multiple domestic and international symposia. In addition to his research, Dr. Skinner is dedicated to providing excellent and compassionate patient care. This dedication is borne out in patient experience measures, with his scores being almost uniformly in the 99th percentile for all categories asked. Moreover, his patients have rated him in the top one percent nationally on Clinician and Group Consumer Assessment of Healthcare Providers and Systems (CGCAHPS) measures related to their experience with him in his clinic.

Meet Jacob Stewart-Ornstein, PhD

Jacob Stewart-Ornstein, PhD, is an Assistant Professor in the Department of Computational and Systems Biology at the University of Pittsburgh School of Medicine. Dr. Stewart-Ornstein joined the Pitt faculty on November 1, 2018, and his research has focused on quantitative understanding of stress response signaling in eukaryotes. His graduate studies, under the joint supervision of Jonathan Weissman and Hana El-Samad at the University of California San Francisco, used the power of budding yeast genetics to study stress response signaling. He showed that cell-to-cell variation in budding yeast was driven by stress signaling through the PKA signaling pathway and uncovered how the PKA responsive transcription factor MSN2 uses low affinity and copy number to retain precise graded control of a stress-responsive regulon. After his graduate work, Dr. Stewart-Ornstein joined the Department of Systems Biology at Harvard Medical School to work with Dr. Galit Lahav. His postdoctoral research focused on the human tumor suppressor protein p53. Dr. Stewart-Ornstein showed that p53 signaling dynamics are diverse across tumors, tissues, and species and used a range of techniques to determine the role of ATM signaling and cis-regulatory variation in this diversity. Dr. Stewart-Ornstein tested this understanding of p53 signaling by using combinations of small molecules and ionizing radiation to alter p53 dynamics and achieved increased cell killing in vitro and tumor control in vivo. In developing his own lab at UPMC Hillman Cancer Center, Dr. Stewart-Ornstein aims to understand how DNA damage detection, repair, and signaling can be both highly conserved in evolution and extremely variable across cell types within our body. He uses live cell imaging, genetic screens, genomic tools, and mathematical models to study the variation in DNA damage signaling and to understand how this signaling might be manipulated to improve cancer therapy. His laboratory is supported by an R00 from NCI.

Meet Yael Nechemia-Arbely, PhD

Yael Nechemia-Arbely, PhD, is an Assistant Professor in the Department of Pharmacology and Chemical Biology at the University of Pittsburgh School of Medicine. She joined the faculty at Hillman on December 17, 2018. Dr. Nechemia-Arbely's research has focused on understanding the structure, composition, and maintenance of the epigenetically defined human centromeres. During her graduate studies, under the joint supervision of Drs. Eithan Galun and Jonathan Axelrod at the Hebrew University of Jerusalem, Dr. Nechemia-Arbely focused on the physio-logical role of Interleukin-6 (IL-6) classical- and trans-signaling in the response to tissue injury. Her work revealed a universal intrinsic role for IL-6 in the response to tissue injury, both in the inflammation accompanying and exacerbating the injury as well as in the protection and regeneration of the tissue. After her graduate studies, Dr. Nechemia-Arbely moved to the Ludwig Institute of Cancer Research and the department of Cellular and Molecular Medicine at University of California San Diego to work with Dr. Don Cleveland. She changed her field of research and turned to study mitosis. Her postdoctoral work focused on the histone variant CENP-A that determines centromere identity epigenetically and is essential for faithful genome segregation. Using a combination of biochemical, hydrodynamics, and genome-wide approaches, she showed that human CENP-A-containing chromatin is an octameric nucleosome across the entire cell cycle with no oscillation between hemisomes to octameric nucleosomes, but with unwinding of the nucleosomal DNA at entry/exit. Using quantitative genome-wide approaches of ChIP-sequencing, Repli-sequencing, and mapping onto novel centromere reference



models she recently identified that DNA replication acts as an error correction mechanism that removes ectopically (chromosome arms) loaded CENP-A, while precisely maintaining CENP-A at the centromere. This error correction mechanism explains how centromere identity is epigenetically maintained and restricted to one position on the chromosome, a finding of high importance for our understanding of evolutionary time-scale of faithful chromo-some inheritance. In her own lab at Hillman, she aims to define the CENCODE – the epigenomic landscape of centromeric chromatin, and the consequences of ectopic CENP-A deposition in human cells. She will use genomic tools and imaging to determine the regulation and maintenance of centromeric chromatin across the cell cycle in health and disease, focusing on cancer and aging.

Hot Papers

Top 10 Hot Papers in 2018: The Genome Stability Faculty at Hillman published ~170 papers in 2018. Here are the top 10 hot papers. A short description of four of these follows.

1. Conrad, M., Kagan, V. E., Bayir, H., Pagnussat, G. C., Head, B., Traber, M. G., and Stockwell, B. R. (2018) Regulation of lipid peroxidation and ferroptosis in diverse species. Genes & Development 32, 602-619

2. Asan, A., Skoko, J. J., Woodcock, C. C., Wingert, B. M., Woodcock, S. R., Normolle, D., Huang, Y., Stark, J. M., Camacho, C. J., Freeman, B. A., and Neumann, C. A. (2018) Electrophilic fatty acids impair RAD51 function and potentiate the effects of DNA- damaging agents on growth of triple-negative breast cells. The Journal of Biological Chemistry, Nov 28

3. Chen, D., Tong, J., Yang, L., Wei, L., Stolz, D. B., Yu, J., Zhang, J., and Zhang, L. (2018) PUMA amplifies necroptosis signaling by activating cytosolic DNA sensors. Proceedings of the National Academy of Sciences of the United States of America 115, 3930-3935

4. Tong, J., Zheng, X., Tan, X., Fletcher, R., Nikolovska-Coleska, Z., Yu, J., and Zhang, L. (2018) Mcl-1 Phosphorylation without Degradation Mediates Sensitivity to HDAC Inhibitors by Liberating BH3-Only Proteins. Cancer Research 78, 4704-4715

5. Roy, S., LaFramboise, W. A., Liu, T. C., Cao, D., Luvison, A., Miller, C., Lyons, M. A., O'Sullivan, R. J., Zureikat, A. H., Hogg, M. E., Tsung, A., Lee, K. K., Bahary, N., Brand, R. E., Chennat, J. S., Fasanella, K. E., McGrath, K., Nikiforova, M. N., Papachristou, G. I., Slivka, A., Zeh, H. J., and Singhi, A. D. (2018) Loss of Chromatin-Remodeling Proteins and/or CDKN2A Associates With Metastasis of Pancreatic Neuroendocrine Tumors and Reduced Patient Survival Times. Gastroenterology 154, 2060-2063.e2068

6. Ackermann, S., Cartolano, M., Hero, B., Welte, A., Kahlert, Y., Roderwieser, A., Bartenhagen, C., Walter, E., Gecht, J., Kerschke, L., Volland, R., Menon, R., Heuckmann, J. M., Gartlgruber, M., Hartlieb, S., Henrich, K. O., Okonechnikov, K., Altmuller, J., Nurnberg, P., Lefever, S., de Wilde, B., Sand, F., Ikram, F., Rosswog, C., Fischer, J., Theissen, J., Hertwig, F., Singhi, A. D., Simon, T., Vogel, W., Perner, S., Krug, B., Schmidt, M., Rahmann, S., Achter, V., Lang, U., Vokuhl, C., Ortmann, M., Buttner, R., Eggert, A., Speleman, F., O'Sullivan, R. J., Thomas, R. K., Berthold, F., Vandesompele, J., Schramm, A., Westermann, F., Schulte, J. H., Peifer, M., and Fischer, M. (2018) A mechanistic classification of clinical phenotypes in neuroblastoma. Science (New York, N.Y.) 362, 1165-1170

7. Bakkenist, C. J., Lee, J. J., and Schmitz, J. C. (2018) ATM Is Required for the Repair of Oxaliplatin-Induced DNA Damage in Colorectal Cancer. Clinical Colorectal Cancer 17, 255-257

8. Vendetti, F. P., Karukonda, P., Clump, D. A., Teo, T., Lalonde, R., Nugent, K., Ballew, M., Kiesel, B. F., Beumer, J. H., Sarkar, S. N., Conrads, T. P., O'Connor, M. J., Ferris, R. L., Tran, P. T., Delgoffe, G. M., and Bakkenist, C. J. (2018) ATR kinase inhibitor AZD6738 potentiates CD8+ T cell-dependent anti-tumor activity following radiation. The Journal of Clinical Investigation 128, 3926-3940

9. Menolfi, D., Jiang, W., Lee, B. J., Moiseeva, T., Shao, Z., Estes, V., Frattini, M. G., Bakkenist, C. J., and Zha, S. (2018) Kinase-dead ATR differs from ATR loss by limiting the dynamic exchange of ATR and RPA. Nature Communications 9, 5351

10. Xu, J., Ma, H., Jin, J., Uttam, S., Fu, R., Huang, Y., and Liu, Y. (2018) Super-Resolution Imaging of Higher-Order Chromatin Structures at Different Epigenomic States in Single Mammalian Cells. Cell Reports 24, 873-882

Congratulations!

Hillman Postdoctoral Fellowships for Innovative Cancer Research Grant Awardees, Ryan Barnes, PhD, (Opresko lab) and Sarah Hengel, PhD, (Bernstein lab). Great work!

Left to right: Dr. Ryan Barnes, Department of Environmental and Occupational Health, Graduate School of Public Health (Dr. Patty Opresko's lab) and Dr. Sarah Hengel, Department of Microbiology and Molecular Genetics (Dr. Kara Bernstein's lab) in the atrium at UPMC Hillman Cancer Center

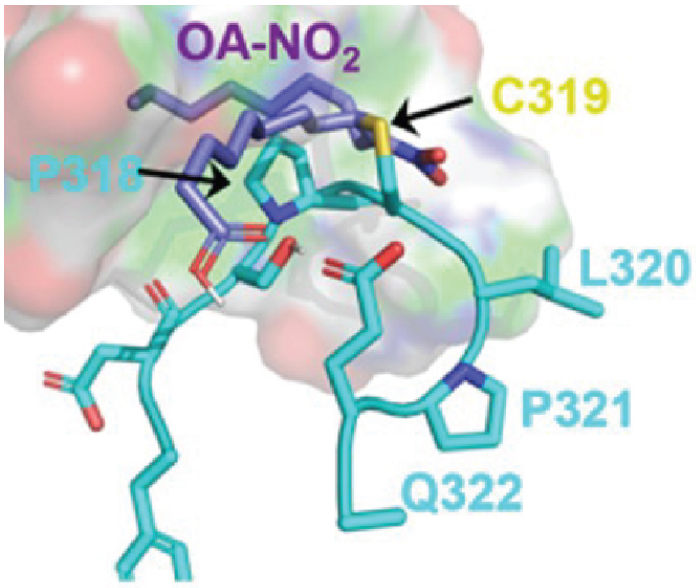


Image is molecular modeling of RAD51 (blue) and OA-NO2 (purple). Binding of OA-NO2 with the Cys-319 residue (gold) of RAD51 is predicted to be further stabilized by hydrophobic interactions with Pro-318 and possible hydrogen bonding with Glu-322 of RAD51. F, OA-NO2disrupts ABL binding to RAD51 in vitro. (Asan et al, 2018, JBC).

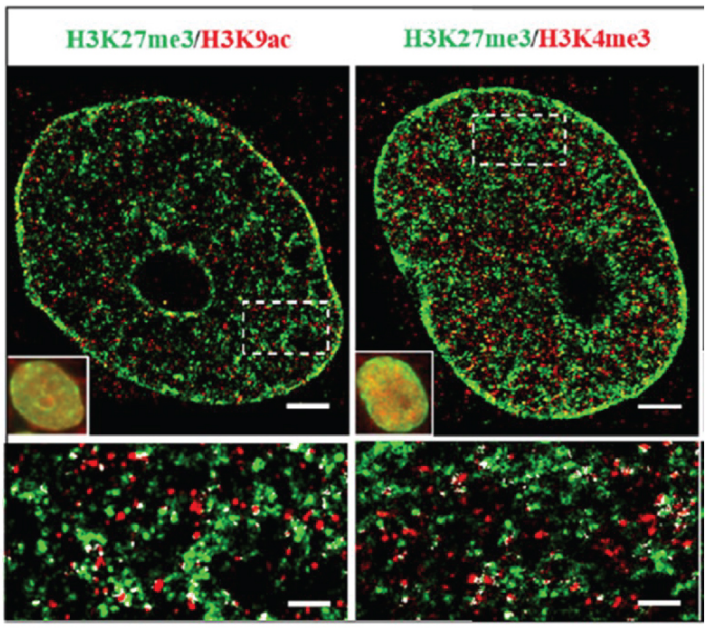
Cool Science

Super-resolution imaging of higher-order chromatin structures at different epigenomic states in single mammalian cells.

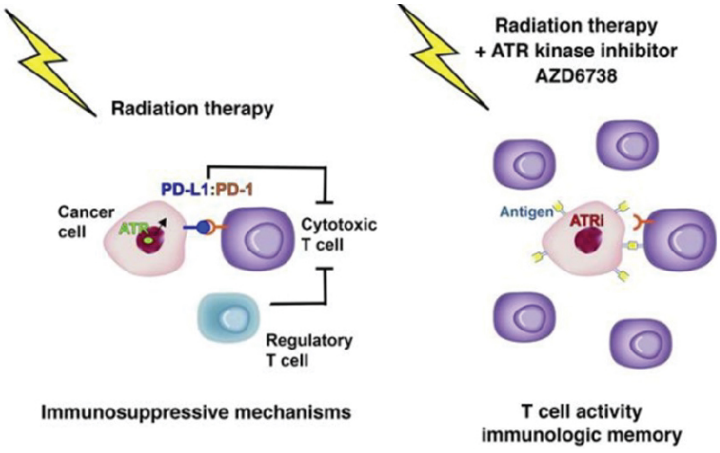
Super-resolution fluorescence microscopy imaging has given unprecedented views into the inner workings of the cell. In this exciting paper, Yang Liu, PhD, has harnessed this approach to examine the nuclear organization of chromatin in normal and tumor cells. Using STORM-based super-resolution microscopy, she and her team discovered that genome-wide higher-order chromatin structures at various epigenomic states form three types of distinct structures: segregated nanoclusters, dispersed nanodomains, and compact large aggregates.

Impact: Their spatial relationship with each other and RNA polymerase II suggests spatial coordination that impacts transcription. (Xu et al, Cell Rep 24(4): 873-882, 2018).

Funding: R01EB016657 and R01CA185363 to YL.



Two-color STORM images of different histone modification marks



AZD6738 combines with conformal radiation therapy to generate immunologic memory in complete responder mice

ATR kinase inhibitor AZD6738 potentiates CD8+ T cell-dependent antitumor activity following radiation.

DNA damage induction with chemotherapy and radiation therapy are integrated into treatment and management for numerous cancer types. Radiation increases programmed death ligand 1 (PDL-1) expression, which binds PD-1 triggering immunosuppression and T-cell exhaustion. Combining expertise in radiation and immunotherapy through an exciting inter-programmatic collaboration, Saumendra Sarkar, PhD, Greg Delgoffe, PhD, Robert Ferris, MD, PhD, and Christopher Bakkenist, PhD, discovered that the ATR kinase inhibitor AZD6738 combined with conformal radiation therapy attenuated radiation-induced T cell exhaustion and promoted T cell activity in a mouse model of Kras-mutant cancer. ATR kinase signals DNA damage, and this team found that AZD6738 mediated ATR inhibition blocked radiation-induced upregulation of PDL-1 on tumors and significantly decreased the number of Tregs infiltrating the tumor.

Impact: These results indicate that the AZD6738 pharmaceutical can enhance radiation-induced cytotoxicity while also promoting radiation-induced anti-tumor immune responses (Vendetti et al, J Clin Invest, 2018).

Funding: R01CA204173 (to CJB), P50CA097190 (to DAC), and R01CA166348 (to PTT); Sidney Kimmel Foundation grant SKF-015-039 and Stand Up 2 Cancer grant SU2C-AACR-IRG-04-16 (to GMD); and NIH grant P30CA047904 (to RLF).

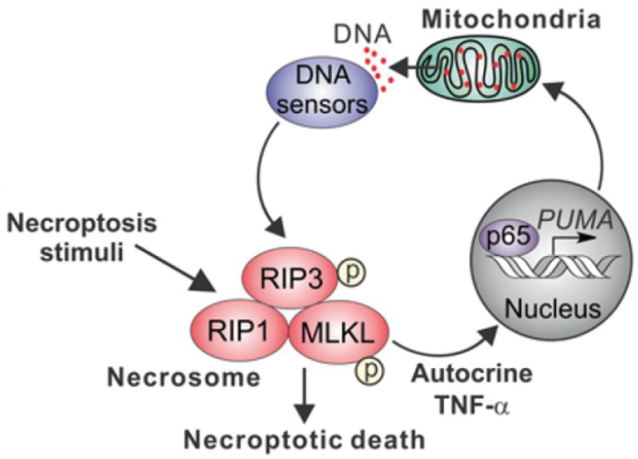
More Cool Science

PUMA amplified necroptosis signaling by activating cytosolic DNA sensors.

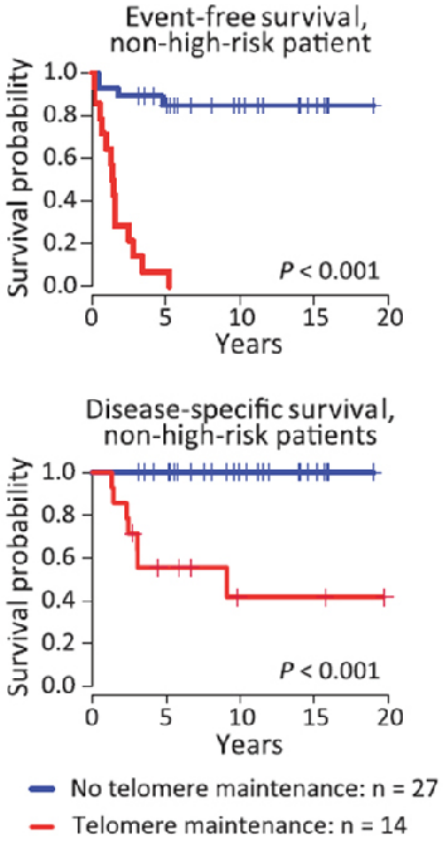
Cell death pathways in the process of aging and cancer, and as collateral damage from cancer therapy, can lead to degenerative disease and compromised tissue function due to depletion of cellular pools. In an intra-programmatic collaboration, Lin Zhang, PhD, Jian Yu, PhD, and Donna Beer Stolz, PhD, discovered that PUMA protein, a proapoptotic BH3-only Bcl-2 family member plays a role in the necroptosis cell death pathway. Necroptosis is a regulated form of necrotic cell death that is triggered by extracellular stimuli and has an important role in physiology and human diseases. They showed that PUMA induction enhances necroptotic signaling by promoting the release of mitochondrial DNA and activation of cytosolic DNA sensors. They showed that PUMA depletion in mice rescues necroptosis-mediated developmental defects, providing genetic evidence for PUMA roles in mediating necroptosis in vivo.

Impact: These results uncovered a previously unidentified function of Bcl-2 family proteins and show that PUMA mediates a signal amplification mechanism that has a role in TNF-driven necroptosis in vitro and in mice (Chen et al, PNAS, 2018).

Funding: Grants CA172136, CA203028, and CA217141, to L.Z.; and U19AI068021, U01DK085570, and R01CA215481, to J.Y.



Model depicting the role of PUMA in necroptosis



A mechanistic classification of clinical phenotypes in neuroblastoma.

Neuroblastoma is a devastating childhood tumor that has poor outcomes despite multimodal treatments. In this collaborative study involving Roderick O'Sullivan, PhD, the team sequenced 416 neuroblastomas from patients who received treatment. Of these, 208 tumors were analyzed for the type of telomere maintenance mechanisms. Patient tumors which lacked telomere maintenance pathways showed the highest survival, whereas patients with telomerase expression or maintenance of telomeres through the alternative lengthening of telomeres (ALT) pathway showed worse prognosis. In addition, those patients which also harbored p53 and/or RAS mutations had the lowest survival.

Impact: This mechanistic study provides a new classification for stratification of severity for neuroblastoma patients and may help with clinical management of this difficult tumor type.

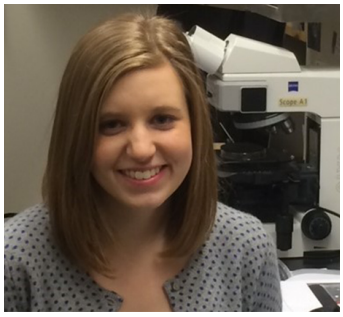
Funding: American Cancer Society, St. Baldrick Foundation, and the NCI R01CA207209-0 to ROS.

Left: Telomere maintenance status and clinical covariates in cohort of non–high risk patients whose tumors harbored RAS or p53 pathway mutations (n = 43).

Special Events

Titia de Lange, PhD, of Rockefeller University provides critical feedback to our program and delivers a fantastic seminar, June 7, 2018.

Each year we invite an expert in Genome Stability to visit UPMC Hillman Cancer Center to help guide our science and discuss future opportunities for high impact science. This past year, Dr. Roddy O'Sullivan invited Titia de Lange, PhD, of Rockefeller University in New York to attend a retreat in which trainees from several GSP laboratories presented their current work to program members. During the question and answer period, members of the audience and Dr. de Lange provided critical feedback on the research to help identify next steps and key additional experiments for publication. We were treated to a wonderful seminar by Dr. de Lange detailing her seminal studies of how her team identified and characterized the shelterin complex that protects our chromosome ends, telomeres, from being aberrantly recognized by DNA damage response and repair proteins. She then described experiments in which her team identified a complex that regulates the generation of 3' single stranded DNA over-hangs involved in recombination events. This exciting work was subsequently published in *Nature* (2018 Aug;560(7716):112-116).



Congratulations Meghan Sullivan, PhD

(Bernstein Lab) on PhD Dissertation Defense *Functional insights into RAD51 regulatory proteins in homologous recombination.*

Notable Life Events— Congratulations!

Congratulations, Namrata Kumar (Van Houten lab) on her marriage to Nikhil Sarma on 10/28/18 and Dr. Tatiana Moiseeva (Bakkenist lab) on her marriage to Samuel Pagliarini on 12/28/18.

Photos left to right: Namrata Kumar, Dr. Tatiana Moiseeva, Mary Byrnes, GSP Administrator and Ariana Detwiler (Opresko lab), Jessica and David Molkentine (Skinner lab)

Congratulations Tatiana Moiseeva, PhD! (Bakkenist Lab)

Left to right: Dr. Robert Sobol, University of Alabama; Dr. Tatiana Moiseeva, University of Pittsburgh (Bakkenist Lab); Alexandra Long, Health Canada; and Dr. Hilde Van Gijssel, Valley City State University

Tatiana Moiseeva, PhD, received the Emerging Scientist Award from the Environmental Mutagenesis and Genomics Society (EMGS). Each year, the society bestows this award to an outstanding student or new investigator chosen by EMGS sister societies, GTA, GETA, GEMS, and the Midwest DNA Repair Group, enabling the recipient to attend the EMGS Annual Meeting. Dr. Moiseeva received another award for her talk "Exploring the mechanism of ATR/Chk1-dependent replication initiation control in undamaged cells." Her seminar was chosen as one of the top two "Best Post-Doc Oral Presentations" at the 1st Southern Genome Maintenance Conference in October 2018.

New Genome Stability Program Associate Faculty and Staff

The Genome Stability Program (GSP) is growing and thriving with many new faculty members: Jonathan Alder, PhD, Department of Medicine, Pulmonary, Allergy & Critical Care; Miguel Brieno-Enriquez, MD, PhD, Magee-Womens Research Institute, Ob/Gyn & Reproductive Sciences; Peter Di, PhD, GSPH-EOH; Bruce Freeman, PhD, Pharmacology & Chemical Biology; Schuchang Liu, PhD, Pathology; Shihui Liu, PhD, Medicine; Songijan Lu, PhD, Biomedical Informatics; Claudette St. Croix, PhD, and Simon Watkins, PhD, Center for Biological Imaging.

The GSP has several new staff members: Ariana Detwiler, Dr. Opresko's lab manager, joined the team in spring 2018. Mary Byrnes, GSP administrator, joined the team in summer 2018.

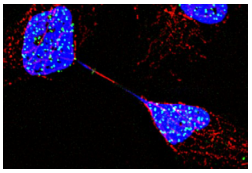
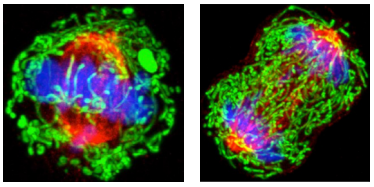
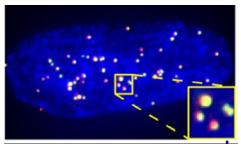
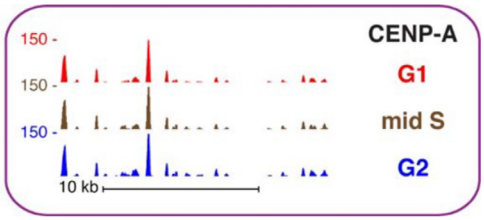
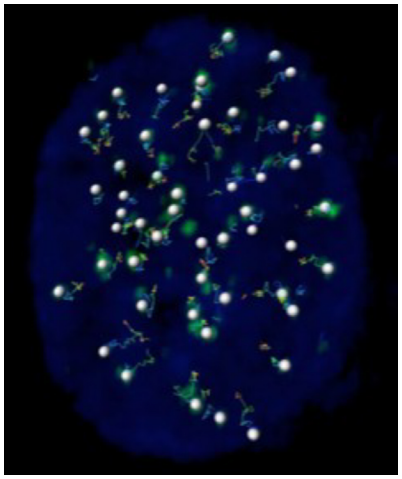
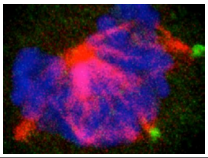
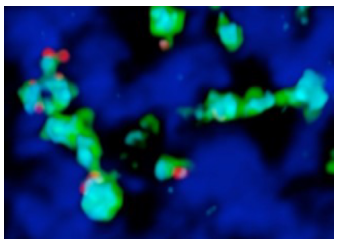
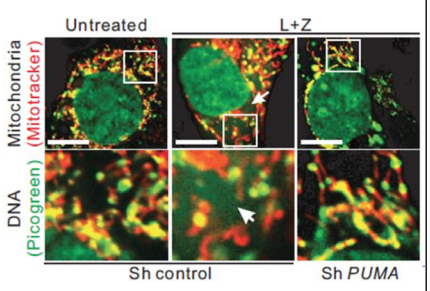
Welcome to Pittsburgh, Jessica and David Molkentine! David is a research specialist who joined Dr. Skinner's lab in November, and Jessica is the Skinner lab manager, who joined us in December. They relocated from Texas and reside in Lawrenceville.

Welcome back to UPMC Hillman Cancer Center, Lyubov Kublo, research technician! She returned to join Dr. Stewart-Ornstein's lab on February 11, 2019.





Genome Stability Program

Genome Stability faculty /PI	New Grants in 2018	Featured Lectures in 2018	Awards and Honors in 2018
Jonathan Alder, PhD	R01 NIH/NHLBI (PI) Mechanism of telomere-mediated lung disease	Thomas L. Petty Aspen Lung Conference – State-of-the-Art speaker, Aspen, Colo. *Role of Senescence in COPD Pathogenesis*	
Chris Bakkenist, PhD		Radiation Research Society annual meeting, Chicago, Ill. *DNA Damage Signaling to Immune Checkpoints*	
Kara Bernstein, PhD	R01 NIEHS (PI) Replication Fork Dynamics and Repair by RAD51 *Paralogues after DNA Alkylation*	Gordon Research Conference on Mutation and Cancer, Ventura, Calif. *Therapeutic alkylating agents and the role of Rad51 paralogs* Biennial Ovarian Cancer Research Symposium, Seattle, Wash. *Ovarian cancer-associated RAD51D mutations which impair its interaction with XRCC2 result in DNA repair deficiency*	"Trailblazer" Honoree at the Ladies Hospital Aid Society Annual Gala Emerging Female Scientist Award, Carnegie Science Center  Nechemia-Arbely et al., JCB 2017, "Human centromeric CENP-A chromatin is a homotypic, octameric nucleosome at all cell cycle points" selected for publication in the 2018 JCB Special Focus: Genome Stability, Special Collection: Nuclear Organization and Function.
Deb Galson, PhD Yael Nechemia-Arbely, PhD	UPP Foundation Grant (PI) *Pilot Evaluation of Targeting TBK1/IKKε as a Therapeutic Approach for Multiple Myeloma Bone Disease* 		
Patty Opresko, PhD	Glenn Award for Research in Biological Mechanisms of Aging (PI)	Public Keynote Lecture, Annual Meeting for the German DNA Repair Society, Karlsruhe, Germany. *DNA Damage and Repair at Telomeres: Implications for Cancer and Aging*	Promoted to tenured full professor of Environmental and Occupational Health. Awarded secondary appointment as tenured full professor of Pharmacology and Chemical Biology
Roddy O'Sullivan, PhD	American Cancer Society Scholar Award (PI) *Mechanistic dissection of Alternative Lengthening of Telomeres*	Yale University, New Haven Conn. *Homology Directed Repair at Telomeres* NCI, Bethesda, Md. *Building bridges between telomeres in cancer cells*	
Heath Skinner, MD, PhD	NIH R01 (Co-PI) *Enhancing immune mediated head and neck cancer anti-tumor activity using nanoparticles*	AACR Annual Meeting, Chicago, Ill. *In vivo shRNA screening identifies synthetic cytotoxicity in CREB-BP/EP300 mutant head and neck cancer* ASTRO Annual Meeting, San Antonio, Texas. *SBRT and lung toxicity abstract discussant* 	
Jacob Stewart-Ornstein, PhD	R00 NCI (PI) *Defining and manipulating quiescence associated DNA damage resistance in single cells.*		
Ben Van Houten, PhD	R01 NIEHS (PI) *Damage Sensor Role of UV-DDB During Base Excision Repair*	2018 International Congress of Genetics, Iguazu Falls, Brazil. *Mitochondrial Dysfunction Causes Telomere Damage*	
Jian Yu, PhD	R01 NIEHS (PI) *Translation addiction and targeting in colon cancer* 	Radiation Research Society annual meeting, Chicago, IL. *Protection against intestinal radiation injury, p53 and beyond* 4th International Genes & Diseases Symposium, Chongqing, China. *Translational addiction of colon cancer*	MCT1 study section, co-chair (10/2018) Molecular Carcinogenesis, Executive Editor 
Lin Zhang, PhD		Second Xiaoxiang Gastrointestinal Tumor Forum, Changsha, China. *Role of Immunogenic Cell Death in Colorectal Cancer Therapy* International Conference of Frontiers in Precision & Translational Medicine, Beijing, China. *Cell Death Regulation in the Precision Treatment of Colorectal Cancer*	