

Developmental Biology

DEPARTMENT NEWS

2019-2020 Edition

The Department of Developmental Biology and the Developmental, Regenerative and Stem Cell Biology graduate program partnered to host the Inaugural Joint Retreat

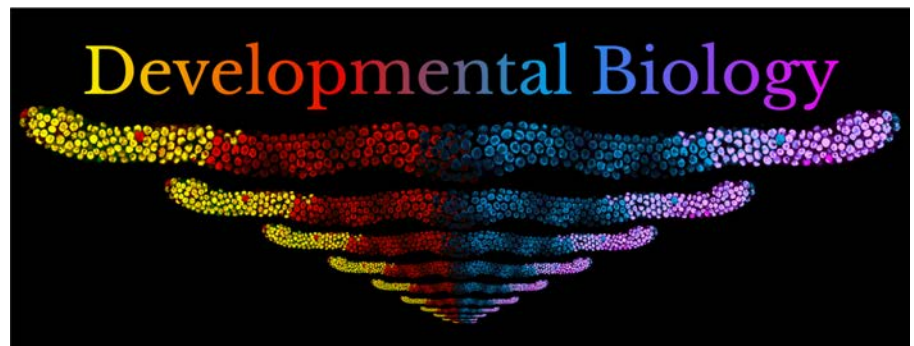
Article contributed by Dr. Kerry Kornfeld

Retreats play a unique role in the life of academic units such as Departments and graduate programs by combining scientific updates with social activities to foster community and collaboration. To maximize these benefits, the Department of Developmental Biology worked with the Division of Biology and Biomedical Sciences' Developmental, Regenerative and Stem Cell Biology (DRSCB) graduate program to put on the first Joint Retreat April 11-12, 2019. Held at Cedar Creek, a conference center in New Haven, Missouri, the retreat brought together laboratories in the Department, students in the program, and laboratories that are affiliated with the program. Thursday included three sessions of 15-minute talks during the day and a poster session in the evening. Friday included two more sessions of 15-minute talks before wrapping up in the afternoon. The retreat also included a postdoc hour, free time and a party Thursday night in the saloon. Labs in the Department that presented talks included Lila Solnica-Krezel, Andrew Yoo, Samantha Morris, Jeanne Nerbonne, David Ornitz, Aaron DiAntonio, Stacey Rentschler, Bo

Zhang, Kerry Kornfeld, Aaron Johnson, Kris Kroll, Zach Pincus, Helen McNeill, and Mayssa Mokalled. Affiliated labs that are training students in the DRSCB program and presented talks included Jason Mills, Jeffrey Millman, Chuck Kaufman, Valeria Cavalli, Heather True and Harrison Gable. The evening poster session featured additional work from the labs of Indira Mysorekar, Lavinia Sheets, Blair Madison, and Christina Gurnett. These presentations highlight the diversity of developmental biology studies at Washington University, including a menagerie of model organisms (worms, flies, fish, mice, etc.) and experiments addressing a wide range of questions regarding animal development, repair after injury, and new approaches to cellular

reprogramming. Retreats require support, which was generously provided by the Department, the DRSCB program, the Center of Regenerative Medicine, and the Training Program in Cellular and Molecular Biology. Future retreats are being planned for fall meetings - the shift to the fall is intended to maximize opportunities to expose first year graduate students to the Developmental Biology community. Once Covid-19 is under control, and virtual meetings are no longer mandated, the retreat will move to a new venue, Pere Marquette Lodge & Conference Center in Grafton, IL, but it will retain the collaboration between the Department and DRSCB program that made the first retreat a success.

The Department hosted an image contest with winners announced at the inaugural retreat. This picture, submitted by Zuzana Kocsisova (Kornfeld lab) entitled "The rapidly aging germline in C.elegans", was just one of the winners.



A PUBLICATION FOR:
**The Department of
Developmental
Biology**

- Histology Core Facility
- Zebrafish Facility

 Washington University in St. Louis
SCHOOL OF MEDICINE

Message from the Chair

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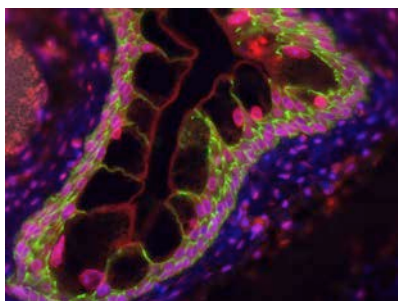
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Dear Alumni and Friends of the Department of Developmental Biology at Washington University School of Medicine in St. Louis,

I am delighted to share with you the 2019-2020 Department of Developmental Biology newsletter highlighting the recent developments and happenings. I hope that you and your families are healthy and well despite the many challenges that we have faced and continue to face.

Wisława Szymborska, the Polish 1996 Nobel Laureate in Literature, wrote in one of her poems “*Tyle wiemy o sobie na ile nas sprawdzono,*” or “*We know ourselves only as far as we’ve been tested.*” The year 2020 and the COVID-19 pandemic tested us as individuals, families, laboratories, departments, schools, countries and as a civilization. 2020 was relentless as we cancelled our travels, reduced our time in laboratories, saw furloughs, lost jobs, and closed businesses and schools, which left families struggling to balance caring for children and their virtual learning at home with professional responsibilities. During 2020, the racial injustice and deep political division in this country were also fully exposed. Too many of us lost family members or friends and too many of us could not travel and join our families in these times of grief.

And yet history tells us that when faced with such grand challenges, individuals and communities can emerge stronger, and such challenges can also trigger or accelerate positive changes. To draw from my own experience, I recall the year 1980, when I became an undergraduate student at Warsaw University in my native Poland, behind the Iron Curtain. At this moment in time the Solidarity social movement spread like wildfire across the country, with millions of people joining and challenging the communist regime. When Poland’s communist government resisted reforms, workers went on strike and students occupied several universities. Solidarity’s progress was abruptly halted on December 13th 1981, when martial law was imposed, Solidarity leaders were jailed, and universities and schools were locked down for months. We could not return to universities until the next spring and did so with big gaps in our academic progress. It took another two years before martial law was lifted, and another several years before socialism in Poland collapsed in 1989, followed by the tearing down of the Berlin wall, collapse of socialism in many other Eastern European countries, and perestroika in the Soviet Union. From the perspective of time and my scientific trajectory, this big interruption of my studies did not matter. Indeed,



Submission from Bisiayo Fashemi (Mysorekar lab) entitled “IFRD1 KO bladder epithelia after high dose tamoxifen injury”

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Mission Statement

For more than a century, the Department of Developmental Biology has led basic science research that has been a part of the foundation for one of the leading medical schools in the country. Our organizational missions are to conduct innovative research that addresses the key developmental biological questions of our era, make discoveries that advance therapies, and to educate leaders among the physicians, scientists and physician-scientists of the future.

it is possible that I still know organic chemistry and biochemistry relatively well because these were the books that I had with me during the occupational student strike at Warsaw University!

The late John Lewis would likely call Solidarity and student unrest “good trouble, a necessary trouble”. It took time, personal sacrifices and setbacks, but the 1981 martial law was the beginning of the end to the socialist system in Poland and Eastern Europe. In this country it has taken too much time and too much sacrifice and human tragedy, but I am hopeful that the tragic events, including the killings of George Floyd, Breonna Taylor and too many other African Americans last year, mark the beginning of the end of racial injustice and systemic racism in this country. At WashU, we begin this work with a look in the mirror, at the history of our school and the city. Even with the pandemic still raging, I feel there is commitment and a feeling of urgency from the top WashU leaders, faculty, trainees and staff. This commitment and urgency make me look into the future with hope.

I am proud and inspired by how we as a Department, School of Medicine and WashU have been facing the COVID-19 pandemic and other headwinds. I observed with admiration and gratitude how our WashU clinical faculty along with the BJC healthcare workers cared for COVID patients, scaled down surgeries and elective procedures to free hospital space and personnel, accelerated telemedicine, scaled up surgeries and elective procedures in spring and summer, and again needed to adapt to record numbers of COVID patients after the winter holiday season, while gearing up to administer COVID vaccines. I am also proud of how we prepared our research community and established guidelines for the initial reduction to minimize interactions and exposure and then to reactivate our research programs in a safe manner. Our faculty, students, postdoctoral fellows and research staff have been truly remarkable, working in shifts, often during early or late hours, and then returning home to take care of their children and their virtual or hybrid schooling. I have seen a lot of collaboration, communication and creativity while following the guidelines of daily screening and social distancing. When our time in the labs was limited, lab members would shorten their hours on campus to make sure that PhD students close to graduation could advance their experiments. And we have done this without any significant spread of COVID in our research community! Developmental Biology Faculty contributed to this effort, but Greg Grant and John Russell have been playing a key role in reviewing detailed laboratory plans. We are also grateful to Zak Kupchinsky, the Zebrafish Facility staff and all who took care of animals and critical resources during the period of minimal research efforts. Our dedicated Administrative and IT personnel worked tirelessly and largely remotely to keep us connected, and to ensure smooth operations, notwithstanding the roller coaster of the compensation and budget plans.

Despite these great challenges, it is remarkable how much we were able to accomplish together in this period. Early in 2020, the Department of Developmental Biology enjoyed visiting with a group of excellent young developmental biologists and recruited Tony Tsai, MD/PhD, who has just arrived with his family in St. Louis and is establishing his laboratory. Tony is applying a combination of mathematical and experimental approaches to study morphogenesis in zebrafish. His postdoctoral work in Sean Megason’s lab at Harvard uncovered a cell adhesion code that controls neuroectoderm morphogenesis during spinal cord formation. Our faculty members have been recognized by numerous awards: Thor Theunissen was awarded a prestigious New Innovator DP2 grant from NIH, as well as grants from the Shipley and Mallinckrodt Foundations to advance his innovative work on naïve human embryonic stem cells and their developmental potential; Mayssa Mokalled has been selected as the 2020 recipient of the H.W. Mossman Award in Developmental Biology, recognizing her pioneering work on the molecular mechanisms of spinal cord regeneration in zebrafish. Sam Morris continues to be on a roll, becoming a 2020 Sloan Research Fellow in Computational and Evolutionary Molecular Biology, a 2020 Allen Distinguished Investigator, a 2020 WUSM Distinguished Investigator and recently a 2020 New York Stem Cell Foundation Investigator, highlighting Sam’s inventive approaches to assessing and manipulating cell fates *in vitro* and *in vivo*. Shin Imai has been selected as the 2020 International Okamoto Awardee by the Japan Research Foundation for Healthy Aging. Aaron DiAntonio received a Javits Award from the National Institute of Neurological Disorders and Stroke for his work on the mechanisms of neuronal degeneration. Highlighting the therapeutic potential of the collaborative work of Aaron and Jeff Milbrandt, Head of the Department of Genetics, on the SARM protein over the last decade, the startup biotech they co-founded, Disarm Therapeutics, was purchased by pharmaceutical giant Eli Lilly and Company. This important advance can speed the development of SARM-based therapeutics for multiple degenerative diseases. Stacey Rentschler, a physician scientist in the Department of Medicine, whose lab is embedded in our department, has been promoted to the rank of Associate Professor and was granted tenure. David Ornitz and Aaron DiAntonio were elected as 2019 and 2020 AAAS Fellows, respectively. In the Center of Regenerative Medicine, we are excited about launching the Rita Levi Montalcini Postdoctoral Fellowship, made possible by an anonymous and generous philanthropist. Excitingly, under the leadership of Farsh Guilak and Angela Bowman, the CRM has been awarded a Postdoctoral Training Grant in Regenerative Medicine from NIH. I welcome you to browse the following pages to learn more about the scientific advances and successes of our faculty and trainees.

There are reasons to look with cautious optimism towards 2021. At the time of this writing, a large proportion of BJC HealthCare and School of Medicine employees and trainees have obtained at least one dose of a COVID-19 vaccine and the community vaccination efforts are ramping up. We are also encouraged by the declarations from the current administration to make science a central theme during their tenure in Washington. In the Department, we are excited about the ongoing expansion of our Zebrafish Facility, continued acceleration of our research and training programs, launching this year a post-baccalaureate program in Developmental Biology and Regenerative Medicine, and anticipating more in person interactions.

With best wishes from the Department of Developmental Biology for 2021 and hopes to see many of you at various conferences either virtually or in person!

Stacey Rentschler Promoted



The Rentschler Lab

Front Row: Stacey Rentschler, Kate Lipovsky, Stephanie Hicks, Uri Goldsztejn, and Kentaro Takahashi

Back Row: Rich Li, Brittany Brumback, Jesus Jiminez, and David Zhang

Article contributed by Dr. Jeanne Nerbonne

Stacey Rentschler, MD, PhD, is a physician scientist in the Department of Medicine, Cardiovascular Division, whose laboratory is located in the Department of Developmental Biology. Since joining Washington University in the Fall of 2012, Dr. Rentschler has developed an innovative research program focused on addressing important unanswered questions about the molecular mechanisms that regulate developmental programming of the electrophysiologically distinct cell types expressed in the mammalian heart, and developing novel translational approaches to treat life-threatening cardiac rhythm disorders. She and her colleagues demonstrated that a genetic interaction between the Notch and Wnt signaling pathways is critical in the development of the atrioventricular junction in the murine heart and that Wnt and Notch function in the transcriptional co-regulation of several cardiac ion channel genes, including *Scn5a*, which encodes the pore-forming alpha subunit, Nav1.5, of the main voltage-gated myocardial sodium channel. In addition to defining the functional importance of the interactions between Wnt and Notch signaling, they went on to demonstrate that Notch independently regulates the expression of myocardial voltage-gated potassium channel pore forming and accessory subunits. These studies, and subsequent work focused on dissecting Wnt signaling in the ventricles, have revealed marked regional differences in the transcriptional and epigenetic mechanisms contributing to shaping the electrophysiological signatures of myocytes in mammalian left and right ventricles. In addition to these mechanistic studies, Dr. Rentschler has been using novel translational approaches, using human heart tissues, in efforts focused on developing new strategies to treat cardiac rhythm disorders. In recognition of the important advances and contributions her laboratory has made, Dr. Rentschler was promoted to Associate Professor with Tenure in 2019.

Grants, Awards and Other Accolades

Recent Faculty Grants

Zachary Pincus, Ph.D., received a five-year R01 grant from the National Institute on Aging for his project entitled “*Discover determinants of individual lifespan and health*”.

David Ornitz, M.D., Ph.D., received a two-year R21 from National Institute of Child Health & Human Development for his project entitled “*Signaling mechanisms and mouse models for insulin-mediated pseudo acromegaly*”.

Andrew Yoo, Ph.D., received a WU-Centene Personalized Medicine Initiative award as part of the Alzheimer’s Disease Program.

Douglas Covey, Ph.D., (Co-PI) and Alex Evers, M.D. (PI), received a four-year R01 for his project entitled “*Molecular sites of neurosteroid binding*”.

Shin-ichiro Imai, M.D., Ph.D., received a five-year R01 grant from the NIH for his project entitled “*eNAMPT-mediated adipo-hypothalamic communication for NAD⁺ production and aging*”.

Jeanne Nerbonne, Ph.D., received a four-year NIH R01 award entitled “*Molecular determinants of regional differences in human ventricular repolarization and remodeling*”.

Mayssa Mokalled, Ph.D., received a McDonnell Center for Cellular and Molecular Neurobiology award for her project entitled “*Mechanisms of adult neurogenesis during spinal cord regeneration in zebrafish*”.

Kristen Kroll, Ph.D., received a one-year grant award from the Undiagnosed Diseases Network (UDN) through Harvard University for her project entitled “*Using human pluripotent stem cell models to evaluate pathogenicity and define disease mechanisms for ZNF292 variant found in UDN 373964*”.



Submission to the image contest from Allen Yen (Dougherty lab) entitled “*Injection of AAV9-PHP.B-GFP transduces neurons and astrocytes in the developing mouse cortex and hippocampus*”

Kristen Kroll, Ph.D., received funding from the M-CM Network Foundation for her project entitled “*A Human iPSC-derived Neuronal Cell Model of PIK3CA-related Overgrowth Spectrum Disorders*”.

Kristen Kroll, Ph.D., received funding from the Jakob Gene Fund for her project entitled “*Patient-derived stem cell models of MYT1L mutation-linked neurodevelopmental disorders*”.

Thorold Theunissen, Ph.D.; Kristen Kroll, Ph.D.; Lilianna Solnica-Krezel, Ph.D., received a Multi-PI grant (Prime PI: Theunissen) for a three-year award from the Children’s Discovery Institute for their project entitled “*Establishing novel stem cell platforms to model developmental disorders in children*”.

Thorold Theunissen, Ph.D., received a joint award with Dr. Joseph Corbo for a one-year award from the McDonnell Center for Cellular and Molecular Neurobiology for their project entitled “*Evaluating the differential potential of naïve human pluripotent stem cells and their suitability for testing a re-programming-based therapy for blindness*”.

Aaron DiAntonio M.D., Ph.D., received a joint award with Dr. Jeffrey Milbrandt for a five-year competing renewal award from the National Institute of Neurological Disorders and Stroke for their project entitled “*Dissection of SARM1-Induced Axon Degeneration and Cell Death*”.

Thorold Theunissen, Ph.D., received a five-year New Innovator Award from the National Institute of General Medical Sciences for his project entitled “*Resolving epigenetic instability during pluripotent state transitions: a roadmap for exploiting the biomedical potential of dynamic human stem cell states*”.

Samantha Morris, Ph.D., received a three-year Allen Distinguished Investigators Award through the Paul G. Allen Frontiers Group for her project entitled “*Reading and writing cell histories: New genomic technologies to unlock cell programming*”.

David M. Ornitz, M.D., Ph.D., and Dr. Robert Gereau received a two-year grant award from the Hope Center for Neurological Disorders for their project entitled “*Determining the pathogenic role of FGFR3 autoantibodies in small fiber neuropathy*”.

Grants, Awards and Other Accolades

Recent Faculty Grants (continued)

Kristen Kroll, Ph.D., received an administrative supplement through the Washington University Intellectual and Developmental Disabilities Research Center for her project entitled “*Down Syndrome iPSC models*”.

Tracey Hermanstynne, Ph.D., received a two-year McDonnell Center for Systems Neuroscience award for her project entitled “*Are daily rhythms in firing activity in SCN neurons required in regulating circadian rhythms?*”

Stacey Rentschler, M.D., Ph.D., received a three-year UH3 multi PI (George and Curiel) award from the NIH for their project entitled “*A 3D in vitro disease model of atrial conduction*”.

Thorold Theunissen, Ph.D., received a three-year New Investigators grant from the Edward Mallinckrodt, Jr. Foundation for his project entitled “*Generation of synthetic embryo models from human stem cells*”.

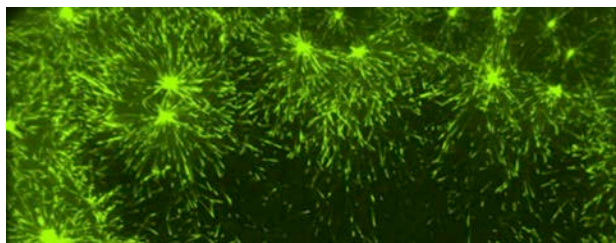
Mayssa Mokalled, Ph.D., received a five-year grant award from the National Institute of Neurological Disorders and Stroke for her project entitled “*Mechanisms of glial bridging and neurogenesis during spinal cord regeneration in zebrafish*”.

Stacey Rentschler, M.D., Ph.D., received a one-year Cancer Biology Seed Award entitled “*Targeted radiation effects on cardiac tissue*”.

Samantha Morris, Ph.D., received a three-year Children’s Discovery Institute award for her project entitled “*Deconstructing the etiology of Hirschsprung Disease via single-nucleus and spatial transcriptomics*”.



Submission to the image contest from Mayssa Mokalled



Submission to the image contest from Gina Castelvechi (Solnica-Krezel lab) entitled “Polymerizing zebrafish microtubule networks”

Samantha Morris, Ph.D., received a two-year Chan Zuckerberg Initiative award as a sub-agreement with Massachusetts General Hospital for her project entitled “*Single-cell resolution of cell lineages and states based on chromatin accessibility combined with CellTagging or somatic mutations*”.

Thorold Theunissen, Ph.D., received a two-year award for the Shipley Foundation Program for Innovation in Stem Cell Science for his project entitled “*Generation of synthetic embryo models from human stem cells*”.

Stacey Rentschler, M.D., Ph.D., and Jesus Jimenez received a one-year McDonnell Genome Institute Pilot and Feasibility Award for their project entitled “*Investigation of polyploidy gene expression changes in normal and failing human hearts*”.

David M. Ornitz, M.D., Ph.D., David T Curiel, Igor P. Dmitriev, Ph.D., and Kel Vin Woo, M.D., Ph.D., received a three-year grant award from the Children’s Discovery Institute for their project entitled “*Targeting the FGF signaling pathway as a novel therapy for Hypoxia-induced pulmonary hypertension*”.

Andrew Yoo, Ph.D., received a two-year grant award from CHDI Foundation for his project entitled “*Identification and implication of epigenetic dysregulation in Huntington’s Disease using directly reprogrammed patient neurons*”.

Kristen Kroll, Ph.D., received a one-year R56 research grant from the National Institutes of Health, National Institute of Neurological Disorders and Stroke for her project entitled “*The cis-regulatory grammar and epigenetic control of human interneuron progenitor specification*”.

Grants, Awards and Other Accolades

Recent Faculty Grants (continued)

Aaron DiAntonio, M.D., Ph.D., received a two-year award from the Hope Center for his project entitled “*SARM1 inhibition as a novel therapeutic strategy for Cln1 disease*”.

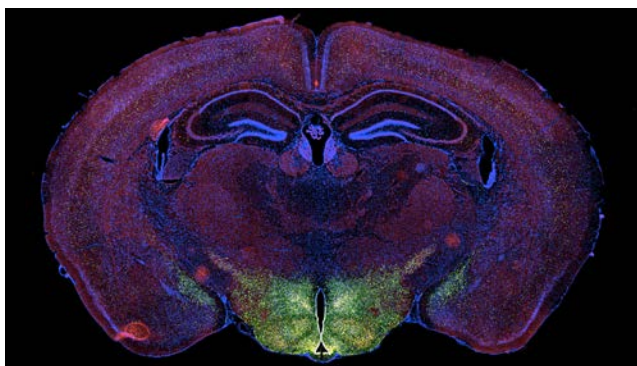
Tracey Hermanstynne, Ph.D., received a two-year award from CIMED for her project entitled “*Molecular dissection of the distinct cellular mechanisms in the SCN driving circadian rhythms in physiology and behavior*”.

Kristen Kroll, Ph.D., received a five-year R01 research grant from the National Institute of Mental Health for her project entitled “*Genomic and functional characterization of ASD and ID-associated MYT1L mutation*”.

David M. Ornitz, M.D., Ph.D., has received a two-year grant award from Eli Lilly & Co. (LRP) for his project entitled “*Effects of endothelial FGF signaling on myocardial dysfunction in a mouse model of heart failure with preserved ejection fraction*”.

Shin-ichiro Imai, M.D., Ph.D., received a two-year research grant from WUCATR – WashU Center for Autophagy Therapeutics and Research for his project entitled “*Elucidating the functional connection between NAD+ metabolism and autophagy in metabolism and aging*”.

Samantha A. Morris, Ph.D., received a five-year New York Stem Cell Foundation Robertson Stem Cell Investigator Award for her project entitled “*New single-cell genomic technologies to dissect and enhance cell fate reprogramming*”.



Submission to the image contest from Kyohei Tokizane (Imai lab) entitled “*RosaGreen Nkx2-1 expression in the brain*”

Stacey Rentschler, M.D., Ph.D., has been selected as one of 8 multi-disciplinary investigators to be funded by Additional Ventures to work together towards a cure for single ventricle heart disease using regenerative medicine approaches. Additional Ventures has committed \$2 million per year for 5 years to fund this initiative.

Lilianna Solnica-Krezel, Ph.D., and John Cooper, M.D., Ph.D., and Fang Lin, Ph.D. (University of Iowa), received a one-year grant award from the Undiagnosed Diseases Network for their project entitled “*Using zebrafish as an animal model to evaluate pathogenicity and define disease mechanisms for a CARMIL3 variant (p.G1in928Glu) found in UDN552818.*”

Aaron DiAntonio, M.D., Ph.D., received a four-year Javits award from the National Institute of Neurological Disorders and Stroke for his project entitled “*Regulation of axonal degeneration by the DLK kinase*”.

Farsh Guilak, Ph.D., (Orthopaedic Surgery) and **Angela Bowman Ph.D.**, on behalf of the Center of Regenerative Medicine, received a grant from the National Institute of Biomedical Imaging and Bioengineering for Training in Regenerative Medicine that will provide support for three postdocs/year for two years.

Helen McNeill, Ph.D., received a four-year grant award from the National Institute of General Medical Sciences for her project entitled “*Dissecting Fat cadherin function in vivo*”.

David Ornitz, M.D., Ph.D., received a four-year grant award from the National Heart, Lung and Blood Institute for his project entitled “*FGF18 regulation of postnatal lung development*”.

Kristen Kroll, Ph.D., received a five-year grant award from the Eunice Kennedy Shriver National Institute of Child Health and Human Development through the Washington University Intellectual and Developmental Disabilities Research Center for her role as Co-Director on the Model Systems Core, Cellular Models Unit.

Samantha Morris, Ph.D., received a 2020 Sloan Research Fellowship.

Grants, Awards and Other Accolades

Awards and Other Accolades

David M. Ornitz, M.D., Ph.D., was named a Fellow of the American Association of Anatomists (AAA).

Dr. Samantha A. Morris, Ph.D., was awarded a 2019 Innovator Award from the Academy of Science in Saint Louis.

Douglas Covey, Ph.D., was installed as the Andrew C. and Barbara B. Taylor Distinguished Professor of Psychiatry on April 1st, 2019.

Helen McNeill, Ph.D., was installed as the Larry J. Shapiro and Carol-Ann Uetake-Shapiro Professor on May 22nd, 2019.

Samantha Morris, Ph.D., received the 2020 Washington University School of Medicine Distinguished Investigator Award.

David M. Ornitz, M.D., Ph.D., was elected a 2019 AAAS Fellow.

Lila Solnica-Krezel, Ph.D., received the Nüsslein-Volhard Award at the 2019 International Zebrafish Society meeting. The Nüsslein-Volhard Award is from the European Society for Fish Models in Biology and Medicine (EuFishBioMed).

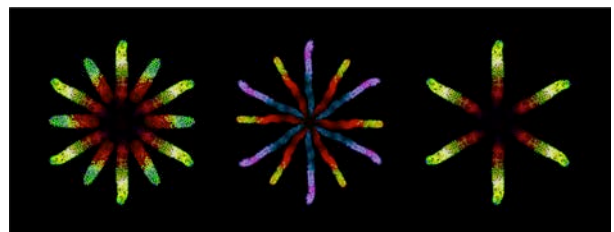
Tracey Hermanstynne, Ph.D., received the Viktor Hamburger Award for Best Instructor Oral Presentation for her talk entitled "*The physiological role of Kv12 Channels in regulating SCN neuronal excitability and behavior*".

Douglas Covey, Ph.D., was issued a patent for Neuroactive enantiomeric 15-, 16-, and 17-substituted steroids as modulators for GABA type-A receptors.

Lilianna Solnica-Krezel, Ph.D., was elected to the International Zebrafish Society Board of Directors as President-Elect.

Douglas Covey, Ph.D., was issued a patent for Neuroactive 19-alkoxy-17-substituted steroids, prodrugs thereof and methods of treatment using same.

Pharmaceutical maker Eli Lilly and Company has purchased Disarm Therapeutics, a startup biotechnology firm founded by researchers at Washington University School of Medicine in St. Louis. Disarm Therapeutics was co-founded by Jeffrey Milbrandt, M.D., Ph.D., and **Aaron DiAntonio, M.D., Ph.D.**, to speed the development of treatments for multiple neurodegenerative conditions.



Submission to the image contest from Zuzana Kocsisova (Kornfeld lab) entitled "The rapidly aging germline in *C. elegans*"

Grants, Awards and Other Accolades

Awards and Other Accolades (continued)

Mayssa Mokalled, Ph.D., received the H.W. Mossman Award in Developmental Biology from the American Association for Anatomy. This award recognizes investigators in the early stages of their careers who have made important contributions to the field of developmental biology, and have demonstrated remarkable promise of future accomplishments.

Stacey Rentschler, M.D., Ph.D., was granted membership to the Steering Committee for Single Ventricle Heart Defects at Milken Institute. The goal of the committee is to create actionable solutions and develop specific plans to solve the issues within the single ventricle field and create solutions that will benefit patients.

Shin-ichiro Imai, M.D., Ph.D., received a gift pledge from Mr. Tsunemaru Tanaka and Mrs. Megumi Tanaka. These funds will be used to support Dr. Imai's laboratory, the Tanaka Postdoctoral Researcher and the Mr. Tsunemaru Tanaka and Mrs. Megumi Tanaka Research Fellowship.

Aaron DiAntonio, M.D, Ph.D., has been elected as a 2020 Fellow of the American Association for the Advancement of Science.

Shin-ichiro Imai, M.D., Ph.D., has been selected as 2020 International Okamoto Awardee by the Japan Research Foundation for Healthy Aging.

Douglas F. Covey, Ph.D., received the Chancellor's Award for Innovation and Entrepreneurship.

Philanthropic Gift Enables Aging Related Research

The Department of Developmental Biology would like to especially thank Mr. Tsunemaru Tanaka and Mrs. Megumi Tanaka for their continued support of Dr. Shin-ichiro Imai and the aging related research in his lab. In addition, at the beginning of the COVID-19 pandemic, Mr. and Mrs. Tanaka donated a large amount of personal protective equipment when personal protective equipment was in short supply. The Department and Washington University in St. Louis greatly appreciates the Tanakas' generosity.



Mr. Tsunemaru Tanaka and Mrs. Megumi Tanaka

2nd Annual Joint Retreat

Article contributed by Dr. Helen McNeill

One of the things we missed in the pandemic shut-down of 2020 was the opportunity to have our annual scientific retreat, usually a great chance to enjoy great science and fun social events...BUT, in the absence of our normal retreat in the countryside, with poster sessions and joint dinners and activities, we had to innovate. Maple Adkins-Threats and Laura Fischer (DRSCB students, Graduate Student Representatives and Retreat Co-coordinators) put together a remarkably successful meeting (slightly aided by Aaron Johnson and Helen McNeill). Graduate students Catie Newsom-Stewart and Jennysue Kasiah designed the beautiful meeting T-shirt. For those who have not received their meeting shirt, please contact Laura or Maple. We had a fantastic series of talks from grad students, postdocs and staff that highlighted the quality and breadth of science in Developmental Biology and Regenerative Medicine. Instead of poster sessions, we had 5-minute lightning talks, which gave glimpses into another exciting set of developing stories. Students also had the opportunity to hear lightning talks from faculty who are open to rotations. Friday ended with a virtual team trivia event, followed by the awards ceremony for the best talks. The Rita Levi-Montalcini Awards for Best Student Presentation went to Margaret Hayne (DiAntonio Lab) and Bisiayo Fashemi (Mysorekar Lab; runner up). The Victor Hamburger Award for Best Postdoc Presentation went to Andrea Scharf (Kornfeld Lab) and Guillermo Rivera Gonzalez (Morris Lab; runner up). The People's Choice Award had a tie for the best student speaker (tied between Sarah Waye (Morris Lab) and Irene Antony (Kroll Lab)) and the best postdoc speaker went to Dana Shaw (Mokalled Lab). The annual image contest brought in a wide range of beautiful science, with first prize to Nick Jensen (Pincus Lab), and second prize to Chen Dong (Theunissen Lab). We look forward to a (hopefully) in-person retreat in the fall (tentative date Sept 26-28th, 2021)!



Samantha Morris Honored with Three Awards

Article contributed by Dr. Angela Bowman



Samantha Morris, Assistant Professor with a dual appointment in Developmental Biology and Genetics, received three notable honors in the past year. Sam was recognized with a Washington University School of Medicine (WUSM) 2020 Distinguished Investigator Award, named an Allen Distinguished Investigator by the Allen Institute, and was named a 2020 New York Stem Cell Foundation Robertson Stem Cell Investigator.

The WUSM 2020 Distinguished Investigator Award recognizes Sam for her outstanding contributions to science. She received her award at a ceremony held on February 26, 2020. Sam follows in the footsteps of a long line of Developmental Biology faculty who have received this award, including Shin-Ichiro Imai (2008), Jeanne Nerbonne (2008), Raphael Kopan (2012), David Ornitz (2015), Kelly Monk (2016), Doug Covey (2017), and Andrew Yoo (2018).

Externally, Sam was also named a 2019 Allen Distinguished Investigator by the Allen Institute. This program “supports early-stage research with the potential to reinvent entire fields. With grants between \$1 million and \$1.5 million to individuals and

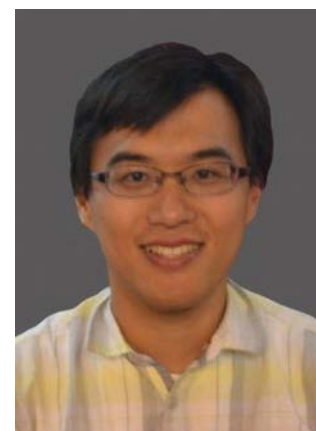
scientific teams, [the Allen Institute] provides these Distinguished Investigators with enough funds to produce momentum in their respective fields.” Each year specific themes or topics are selected around which to make awards, and Sam was chosen for her contributions to our understanding of stem cells and, in particular, her application of CellTagging methodologies to better understand cellular reprogramming. Importantly, Sam is the first ever Allen Distinguished Investigator from WUSM.

In October 2020, Sam was named as one of three NYSCF Robertson Stem Cell Investigators. This program, which provides \$1.5 million in seed funding, “fosters and encourages promising early career scientists whose cutting-edge research holds the potential to accelerate treatments and cures.” Sam was recognized for her past work and proposal to harness genomic technologies to better understand direct conversion, with the ultimate goal of developing regenerative therapies for disease of the small intestine.

Congratulations, Sam, on another excellent year of science and accolades.

Tony Tsai, M.D., Ph.D. joins the Department of Developmental Biology Faculty

Dr. Tony Tsai rose to the top of an applicant pool of over 130 during this past year’s recruitment activities and we are fortunate that he started with the Department of Developmental Biology on January 1, 2021. Dr. Tsai’s describes his research program: “Trained as a systems developmental biologist, I am fascinated by the striking robustness of embryo development. Despite environmental fluctuations and the stochastic nature of instructive signals, cells generate tissue-scale patterns and structures in a precise and reproducible fashion. My lab aims to understand the reciprocal regulation between biochemical signaling and cell mechanics that enables robust control of tissue pattern, shape and size during embryo development. Using the zebrafish as the primary model, my lab will take multidisciplinary approach, using in vivo live imaging, CRISPR genetics and biophysics tools to perturb and visualize cellular dynamics, and systems biology principles to understand the wiring logic of regulatory networks.”



Postdoc and Student Awards

Fellowships

Ya-Lin Lu, (Yoo Lab): Ya-Lin received a one year LIFENAD Graduate Student Fellowship.

Cecilia Lei, (Imai Lab): Cecilia received a one year LIFENAD Graduate Student Fellowship.

Brian Egan, (Kornfeld Lab): Brian received the FY20 Irving Boime Graduate Student Fellowship Award.

Brian Earley, (Kornfeld Lab): Brian received a three-year F31 Fellowship award from the NIH/NIEHS for his project entitled “*Zinc is a novel ligand of nuclear receptors*”.

Brittany Brumback, (Rentschler Lab): Brittany received an NSF GRFP Fellowship award for her project entitled “*Defining the regulation and role of Hey2 in regional-specific cardiac conduction*”.

Kel-Vin Woo, M.D., Ph.D., (Ornitz Lab): Kel-Vin received an ENTELLIGENCE Young Investigator Program Award through Actelion Pharmaceuticals for his project entitled “*Endothelial drug targets for hypoxia-induced pulmonary hypertension*”.

Kyohei Tokizane, Ph.D. (Imai Lab): Kyohei received a one-year Postdoctoral Fellowship Award from the Glenn Foundation for his project entitled “*Investigating the role of dorsomedial hypothalamus in mammalian aging*”.

Dana Shaw, Ph.D., (Mokalled Lab): Dana received a one-year W.M. Keck Fellowship.

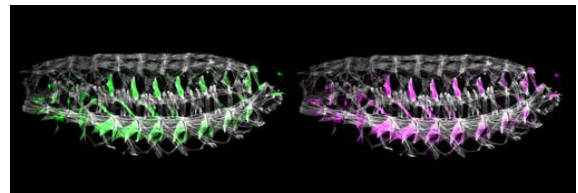
Brian Lannana, Ph.D., (Imai Lab): Brian received a one-year W.M. Keck Fellowship.

Laura Devault, Ph.D., (DiAntonio Lab): Laura received a two-year NRSA from the National Institute of Neurological Disorders and Stroke for her project entitled “*Dissecting Neuroimmune response after axon injury*”.

Christy Hoffman, (Morris Lab): Christy received a National Science Foundation (NSF) Graduate Research Fellowship.

Kitra Cates, (Yoo Lab): Kitra received the FY21 Irving Boime Graduate Student Fellowship Award.

Wenjun Kong, (Morris Lab): Wenjun received the FY21 Douglas Covey Graduate Student Fellowship Award.



Submission to the image contest from Shuo Yang (Johnson lab) entitled “Fly-ing high”

Other Awards

Brian Lananna, Ph.D., (Imai Lab): Brian received the 2019 John E. Majors award.

Isabelle Roszko Ph.D., (Solnica-Krezel Lab): Isa was awarded the FEBS Letters First Level Poster Prize at the 14th International Zebrafish Conference in Suzhou, China.

Margot Williams, Ph.D., (Solnica-Krezel Lab): Margot received the International Zebrafish Society’s 2020 Chi-Bin Chien Award.

Boime Publication Award

2019 Awardee

Alex Russo, mentored by Aaron DiAntonio, for her publication entitled, “*Wnd/DLK Is a Critical Target of FMRP Responsible for Neurodevelopmental and Behavioral Defects in the Drosophila Model of Fragile X Syndrome*” which was published in *Cell Reports*, 2019.



Aaron DiAntonio accepts the 2019 Boime Publication Award at the 2019 Developmental Biology Holiday Party. Pictured left to right, Lila Solnica-Krezel, Martin Matzuk, Aaron DiAntonio and Irving Boime.

2020 Awardees

Kitra Cates and Ji-Sun Kwon, mentored by Andrew Yoo, for their publication entitled, “*Deconstructing Stepwise Fate Conversion of Human Fibroblasts to Neurons by MicroRNAs*” which was published in *Cell Stem Cell*, 2020.



Martin Matzuk, M.D., Ph.D., an alumnus of the Department of Pharmacology/Developmental Biology, in recognition of his mentor, Irving Boime, Ph.D., for his outstanding mentorship, established the Irving Boime Publication award in October 2010. The award is presented annually to a student in the Department of Developmental Biology who publishes a paper exemplifying high quality, innovative and significant science.

Postdoc and Student Awards

Other Awards (continued)

Andrea Scharf, Ph.D., (Kornfeld Lab):

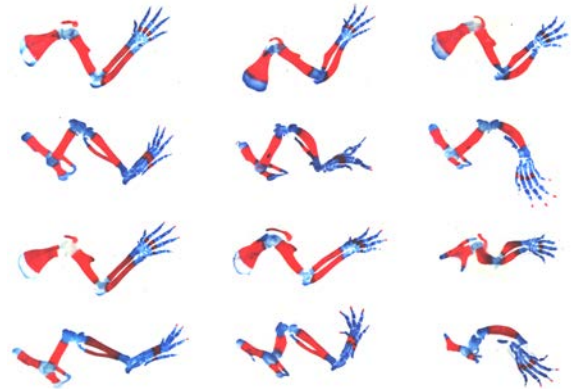
Andrea received the 2019 Viktor Hamburger Award for Best Postdoc Oral Presentation for her talk entitled “*How to get old in a population – a systems approach to aging*”.

Wookyung Kim, Ph.D., (Yoo Lab):

Wookyung received the 2019 Rita Levi-Montalcini Award for Best Postdoc Poster Presentation for her poster entitled “*Epigenetic mechanisms underlying neurodegeneration in patient-derived neurons of Huntington’s Disease*”.

Mitsukuni Yoshida, (Imai Lab):

Mitsukuni received the 2020 Needleman Prize. The Needleman Prize is presented to a graduating student who has demonstrated outstanding achievements in the field of pharmacology.

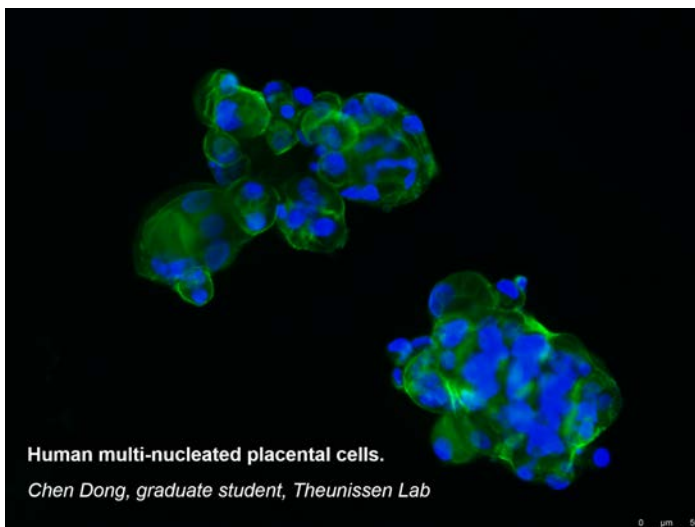


Submission to the image contest from David Ornitz entitled “*Compilation of null alleles of Fgf9 and Fgf18 progressively lead to increased skeletal deformity. Shown are the limbs from embryonic day 18.5 mice with increasing numbers of null alleles of Fgf9 and Fgf18 ranging from wild type in the upper left to homozygous null in the lower right.*”

Kitra Cates, (Yoo Lab): Kitra received the 2019 Rita Levi-Montalcini Award for Best Student Poster Presentation for her poster entitled “*The non-coding RNA 7SK mediates neuronal cell fate specification*”.

Brittany Brumback, (Rentschler Lab): Brittany won Best Poster Award at the Gordon Research Conference on Arrhythmia Mechanisms for her poster entitled “*Chamber-Specific Regulation of Hey2 by Notch and Wnt Signaling Pathways*”.

Lauren Walker, Ph.D. (DiAntonio Lab): Lauren received the 2020 Hilde Mangold Postdoctoral Symposium Award for her talk at the 79th Society for Developmental Biology Meeting. Lauren is currently a postdoctoral fellow in Michael Granato’s lab.



Postdoc and Student Awards

Other Awards (continued)

Margaret Hayne, (DiAntonio Lab): Margaret received the 2020 Rita Levi-Montalcini Award for Best Student Presentation.

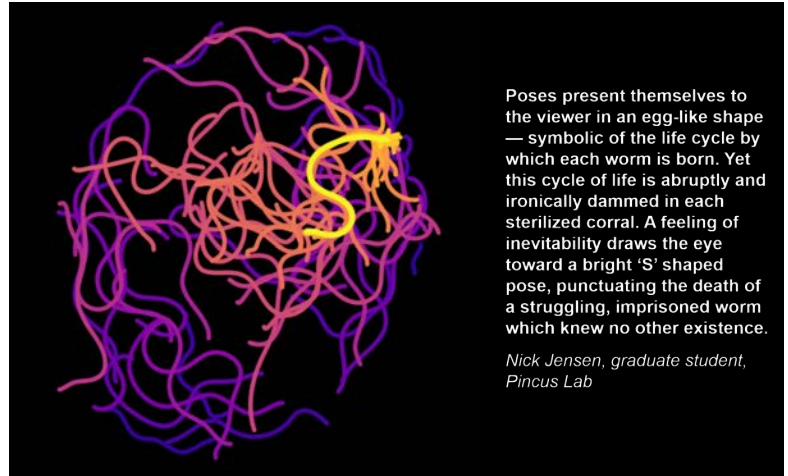
Andrea Scharf, Ph.D., (Kornfeld Lab): Andrea received the 2020 Viktor Hamburger Award for Best Postdoc Presentation.

Guillermo Rivera Gonzalez, Ph.D., (Morris Lab): Guillermo received the 2020 runner up Viktor Hamburger Award for Best Postdoc Presentation.

Dana Shaw, Ph.D., (Mokalled Lab): Dana received the 2020 People's Choice Award for best postdoc speaker.

Sarah Waye, (Morris Lab): Sarah received the 2020 People's Choice Award for best student speaker.

Irene Antony, (Kroll Lab): Irene received the 2020 People's Choice Award for best student speaker.



Nick Jensen, (Pincus Lab): Nick received first place in the 2020 DRSCB/DB Virtual Retreat image contest.

Chen Dong, (Theunissen Lab): Chen received second place in the 2020 DRSCB/DB Virtual Retreat image contest.



2020 Virtual Retreat Mug

Center of Regenerative Medicine Postdoctoral Fellows in Regenerative Medicine

The Center of Regenerative Medicine awarded four postdoctoral fellowships in the Department of Developmental Biology. This program is aimed at attracting the highest caliber postdocs to WUSTL.



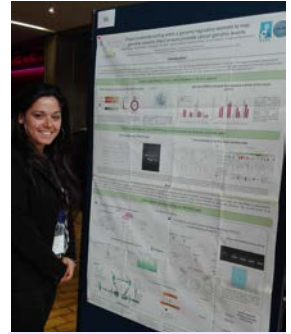
Laura Devault, Ph.D., joined the laboratory of Dr. Aaron DiAntonio



Dana Shaw, Ph.D., joined the lab of Dr. Mayssa Mokalled



Rowan Karvas, Ph.D., joined the lab of Dr. Thorold Theunissen



Blerta Stringa, Ph.D., joined the lab of Dr. Lila Solnica-Krezel

Mayssa Mokalled Wins H.W. Mossman Award

Article contributed by Dr. Angela Bowman

Mayssa Mokalled PhD, Assistant Professor, was honored with the 2020 H. W. Mossman Award from the American Association for Anatomy. The award is named for Harland W. Mossman, a respected anatomist and teacher, who made contributions to many fields, including placentology. Mayssa was recognized for her “bold vision...that the regenerative pathways in zebrafish are evolutionarily conserved, but masked, in mammals. She aims to fully elucidate the cellular and molecular mechanisms of spinal cord (SC) regeneration in zebrafish and use this knowledge to uncover innate regenerative mechanisms of the mammalian SC and learn how to direct them to promote glial bridging and adult neurogenesis.”

This early career award, which honors significant contributions to developmental biology, comes with a \$1000 honorarium and travel to the annual American Association of Anatomy meeting at the larger Experimental Biology Meeting. The annual AAA/EB meeting, which was scheduled to be held April 4-7, 2020, in San Diego, California, was postponed due to COVID19 until May 2021.

Congratulations, Mayssa, on this recognition of your contributions to developmental biology and your potential for future impact.



Postdocs and Students who joined the Department of Developmental Biology

The department welcomed many new postdoctoral fellows and graduate students to the department in 2019 at a special tea time held on October 4, 2019.

Postdocs: Laura Devault joined the DiAntonio lab; Brian Lananna joined the Imai lab; Franzi Pohl joined the Kornfeld lab; Joe Thanintorn and Abira Ganguly joined the McNeill lab; Dana Shaw joined the Mokalled lab; Shafqat Ali Khan joined the Theunissen lab; and Zhao Sun and Youngmi Oh joined the Yoo lab.

Students: Kelsey Krus joined the DiAntonio lab; Sadie VanHorn, Kunal Jindal, Emily Butka, Christy Hoffman and Snow Yang joined the Morris lab; and Chen Dong and Laura Fischer joined the Theunissen lab.



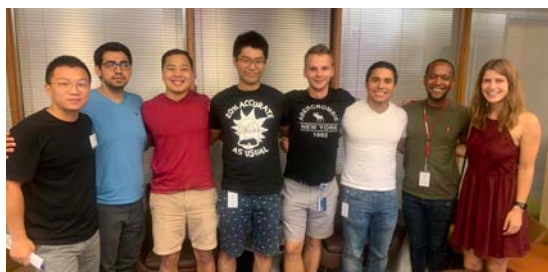
Special Tea Time to welcome new students and postdocs

While 2020 did not allow us to meet and greet in person, the new postdoctoral fellows and students that joined the department in 2020 were welcomed at a special virtual meeting on October 23.

Postdocs: Rowan Karvas joined the Theunissen lab; Vishnu Saraswathy joined the Mokalled lab; Nick Bodmer joined the Ornitz lab; Komal Kaushik joined the Kroll lab; Kentaro Mori and Junya Unno joined the Imai lab; Linwei Li and Blerta Stringa joined the Solnica-Krezel lab; Paul Kepper joined the Morris lab; Jeremie Ferey and Anthony Frosio joined the Nerbonne lab; David Butler joined the Yoo lab; Lei Huang joined the Rentschler lab.

Students: Ji-Sun Kwon joined the Yoo lab; Mikolaj Kozlowski joined the DiAntonio lab; Aelita Zhu joined the Imai lab; Nien-Du Yang joined the Nerbonne lab; Jennysue Kasiah joined the McNeill lab.

New Students to the Developmental, Regenerative and Stem Cell Biology Program



The 2019/2020 DRSCB incoming class. *Pictured left to right: Ruijun He, Jonny Mendoza-Castrejon, Tae Jun Lee, Yiming Zhang, Mikolaj Kozlowski, Daniel Veronese Paniagua, Dereck Alleyne and Catherine Newsom-Stewart. Not pictured: Jennysue Kasiah and Jesús A. Acevedo Cintrón.*

The 2019/2020 incoming class of Developmental, Regenerative and Stem Cell Biology Program in the Division of Biology & Biomedical Sciences welcomed ten new students at a special tea time held on August 23, 2019.

The 2020/2021 incoming class were welcomed at a special virtual meeting on October 23, 2020.



Aaron Anderson



Bridget Hunkins



Marlie Maestas



Luke O'Connor



Jiameng Sun

Faculty Publications

Visualizing pregnenolone sulfate-like modulators of NMDA receptor function reveals intracellular and plasma-membrane localization. Chisari M, Wilding TJ, Brunwasser S, Krishnan K, Qian M, Benz A, Huettner JE, Zorumski CF, **Covey DF**, Mennerick S. *Neuropharmacology*. 2019 Jan;144:91-103.

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Negative-Pressure Wound Therapy in Infants and Children: A Population-Based Study. Santosa KB, Keller M, Olsen MA, Keane AM, Sears ED, **Snyder-Warwick AK**. *J Surg Res*. 2019 Mar;235:560-568. doi: 10.1016/j.jss.2018.10.043.

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Neural crest-derived neurons invade the ovary but not the testis during mouse gonad development. McKey J, Bunce C, Batchvarov IS, **Ornitz DM**, Capel B. *Proc Natl Acad Sci U S A*. 2019 Mar 19;116(12):5570-5575.

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The E3 ligase Highwire promotes synaptic transmission by targeting the NAD-synthesizing enzyme dNmnat. Russo A, Goel P, Brace EJ, Buser C, Dickman D, **DiAntonio A**. *EMBO Rep*. 2019 Mar;20(3). pii: e46975. doi: 10.15252/embr.201846975.

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Ornitz Elected Fellow to AAA and AAAS

Article contributed by Dr. John Russell



This past year, David was elected Fellow of both the American Association of Anatomy (AAA) and the American Association for the Advancement of Science (AAAS) for both his service and contribution to the scientific community. His contributions and mentorship were highlighted by Valerie Burke DeLeon, President-elect of AAA at his AAAS Fellowship induction, saying "...Dr. Ornitz generously shared a valuable mouse model when I was starting my own research lab." David has shared his genetically engineered mice with well over three hundred academic laboratories.

David Ornitz is an Alumni Endowed Professor in Developmental Biology. He received his M.D./Ph.D. training at the University of Washington and after a postdoctoral fellowship at Harvard University was recruited by Jeff Gordon to the Department of Molecular Biology and Pharmacology. The Ornitz laboratory is internationally recognized for their work on Fibroblast Growth Factors (FGFs), which are essential molecules for development, physiology, response to injury, and cancer. Current studies in the Ornitz lab are examining FGFs, FGF receptors, and a variety of other interacting signaling pathways in the mouse embryo and in adult mice, with a focus on inner ear, skeletal, cardiovascular, and pulmonary development, physiology, and injury response.

David has been an integral part of the emergence of a developmental biology focus in the Department and served as Interim Chair of the Department from 2004-2009 during the transition from the Department of Molecular Biology and Pharmacology to the Department of Developmental Biology. He has also been recognized as a Distinguished Investigator and Outstanding Faculty Mentor by the University.

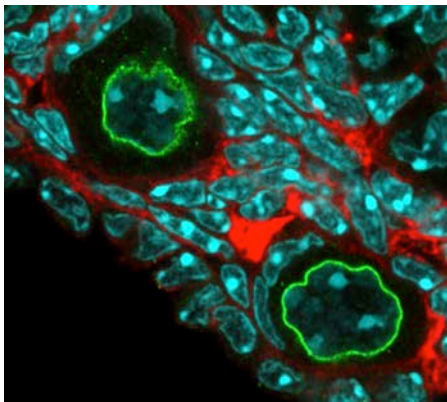
Picnic in the Park

In September 2019, the Department hosted a picnic in Forest Park for all the members of the department and their families. Fun was had by all with volleyball, T-ball, washers, bean bag, lawn darts, a piñata and an air brush tattoo artist. The day ended with a visit from the ice cream truck!

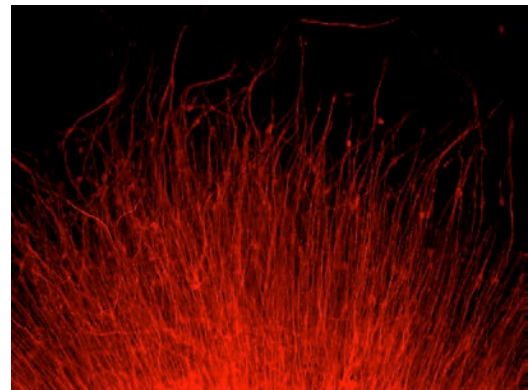


Geoffrey Goodhill, Ph.D., joining the Department of Developmental Biology

We are delighted to announce that Geoffrey Goodhill, Ph.D., will be joining Washington University School of Medicine in St. Louis in 2021, to be dually appointed as Professor in the departments of Developmental Biology and Neuroscience. In his interdisciplinary research Dr. Goodhill combines mathematical and experimental approaches to investigate the computational principles underlying neural development, particularly in the zebrafish model. Dr. Goodhill earned his bachelor of science degree in Mathematics and Physics at the University of Bristol, UK, his masters in Artificial Intelligence at the University of Edinburgh and his PhD in Cognitive Science at the University of Sussex, UK. He carried out his postdoctoral studies in computational neuroscience at the University of Edinburgh, UK, and continued them in the US at Baylor College of Medicine and the Salk Institute for Biological Studies as a Sloan Theoretical Neuroscience Fellow. Dr. Goodhill was appointed to his first faculty position at Georgetown University Medical Center in 1996, where he was promoted with tenure in 2001. In 2005 he moved to The University of Queensland where he is currently a Professor jointly between the Queensland Brain Institute & School of Mathematics and Physics. He has published over 100 peer-reviewed papers, and has been recognized by the Paxinos-Watson Prize and the Elspeth McLachlan Plenary Award from the Australasian Neuroscience Society. He served as Editor-in-Chief of the journal *Network: Computation in Neural Systems* and is currently on the Editorial Boards of *Brain Informatics* and *Neural Computation*. His recent TEDx talk can be viewed at <https://www.youtube.com/watch?v=yyNEOwEg6-I>.



Submission to the image contest from Didier Hodzic (McNeill lab) entitled "Immunolocalization of Nemp1 (green), a nuclear envelope protein required for fertility, in primordial mouse oocytes"



Submission to the image contest from Zhao Sun (Yoo lab) entitled "Neurospheroid formed by directly reprogrammed human neurons"

Covey named Taylor Distinguished Professor of Psychiatry

Article contributed by Dr. John Russell

Doug trained as a chemist at Johns Hopkins University, becoming an expert in steroid medicinal chemistry during his postdoctoral training. He was hired by Phil Needleman into the Department of Pharmacology. Since that time, he has become an internationally recognized expert, synthesizing thousands of novel steroids, with his team of students, postdocs, and staff scientists. Steroids produced by Doug have provided important insights into breast cancer drugs, anti-epileptics, and most recently in neurosteroids that have anesthetic and anti-depressive activity. Doug was a co-founder of Sage Pharmaceuticals in 2010, seeking to license his novel neurosteroids for clinical trials. Doug received the St. Louis Award from the American Chemical Society in 2004 and in 2017, Doug was named a Washington University Distinguished Investigator. Doug was recognized in 2019 by election to the National Academy of Inventors, as a Senior Member, for his many patented compounds tested and used in clinical medicine.



Douglas F. Covey, PhD, speaks at his installation as the inaugural Andrew C. and Barbara B. Taylor Distinguished Professor of Psychiatry at Washington University School of Medicine in St. Louis.
Photo: Mark Beaven

Most recently, Doug has developed a crucial collaboration with Prof. Charles Zorumski, the Samuel B. Guze Professor, Head of the Department of Psychiatry, and Head of the Taylor Family Institute for Innovative Psychiatric Research. Collaboration between the Taylor Family Institute and Sage Pharmaceuticals is moving towards the rapid testing of anti-depressant steroids produced in Doug's lab. The Taylor family recently recognized Doug's contribution by endowing Doug as the Andrew C. and Barbara B. Taylor Distinguished Professorship in the Department of Psychiatry.

Postdoc Liaisons Forum

Article contributed by Mayssa Mokalled

Launched in the fall of 2018, the Postdoc Liaisons Forum aims to provide scientific advising, career support, and a social network for our postdoctoral community. Dr. Helen McNeill and Dr. Mayssa Mokalled were selected by faculty and postdocs to support this Forum. The community meets on the first Wednesday of each month. Meetings alternate between practice chalk-talks, grant or manuscript discussions, or occasional social happy hours. These casual, postdoc-driven liaisons have provided informal feedback from peers, fostered new collaborations, and enhanced the camaraderie between the postdoctoral fellows of the Department of



Special Tea Time to recognize Postdoc accomplishments

Faculty Spotlight: Thorold Theunissen, Ph.D.

Article contributed by Dr. Angela Bowman

The Department's newest addition, **Dr. Thorold Theunissen**, has wasted no time getting his laboratory up and running, winning several prestigious junior investigator awards in the process.

Thor joined the Department in January 2018 from the Whitehead Institute for Biomedical Research, where he was a postdoctoral fellow in the laboratory of Rudolf Jaenisch. While in the Jaenisch lab, Thor developed conditions that allow the derivation and culture of naïve human pluripotent stem cells. Human naïve stem cells represent an earlier developmental stage than traditional human embryonic stem cells, and are thus thought to have greater developmental potential, which is important for their use in developmental and disease modeling schemes, as well as for generating clinically relevant cell types for regenerative medicine.



Theunissen Lab pictured left to right: Thorold Theunissen, Chen Dong, Laura Fischer, Kyoung Park, Yiming Zhang, and Shafqat Khan

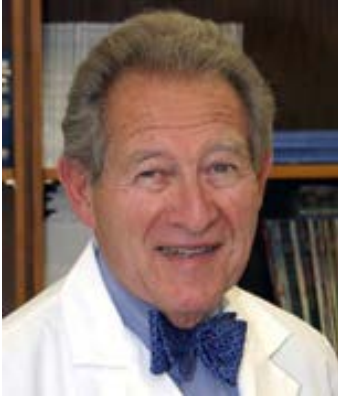
In his own lab, Thor is continuing his pioneering work on naïve pluripotency. “While we're continuing to flesh out some of the ideas that I presented during my interview, we've also embarked on an entirely new direction to model placental development that did not even feature in my plans two years ago. This effort has had a major boost from collaborations with other labs in DB, Genetics and OB/GYN”, Theunissen says.

Recognition for Thor's outstanding scientific vision has come from numerous sources. Internally he is the primary investigator on a large-scale collaborative grant from the Children's Discovery Institute. Along with Kristen Kroll and Lila Solnica-Krezel, the grant aims to utilize human pluripotent stem cells for modeling pediatric developmental disorders. Thor was also named an Edward Mallinckrodt Jr. Foundation Scholar and received the extremely prestigious NIH Director's New Innovator Award, in both cases following in the footsteps of Andrew Yoo from the department. He has also been awarded a grant from the inaugural Shipley Foundation Program for Innovation in Stem Cell Science.

“It's been overwhelming at times to juggle my research program with the additional demands of being a new PI, in particular learning to be an effective recruiter, grant writer, budgeter and reviewer of other scientists' work. However, I'm very pleased with my lab's progress during this short time.” But Thor credits the collegial environment in Developmental Biology for easing the transition into a faculty position. “I continue to be amazed by the support offered to junior faculty members in our department. Just [recently] I had a two hour lunch with one of my faculty mentors to iron out plans for a manuscript.”

In addition to embarking on a strong scientific trajectory, Thor is also an engaged member of the department, teaching the Development, Regeneration, and Aging Journal Club and serving on the faculty search committee.

Special Seminars



The David M. Kipnis lectureship was established to honor the late Dr. David Kipnis, Distinguished University Professor of Medicine and chair of the Department of Medicine from 1972 to 1992. Each annual lecture is delivered by an individual whose work on basic questions related to the control of cell growth, differentiation and communication has important implications for understanding the origins of human diseases.

In March, the Department of Developmental Biology hosted Dr. Virginia M-Y. Lee, the John H. Ware 3rd Professor in Alzheimer's Research in the Department of Pathology & Laboratory Medicine at the University of Pennsylvania School of Medicine, who presented the 21st David M. Kipnis Lecture.



Talk title: “Transmission of misfolded proteins in neurodegenerative disorders: A common mechanism of disease progression”

In October, the Department of Developmental Biology hosted Dr. Andrew McMahon, W.M. Keck Provost and University Professor of Stem Cell Biology and Regenerative Medicine Chair, Department of Stem Cell Biology and Regenerative Medicine; and Director, Eli and Edythe Broad Center for Regenerative Medicine and Stem Cell Research, University of Southern California, who presented the 39th Annual Oliver H. Lowry Lecture.



Talk title: “Developmental strategizing towards the treatment of kidney disease”



The Lowry Lecture is held annually to honor the many contributions of the late Oliver Lowry to the field of biochemistry and metabolic regulation, as well as to Washington University. Dr. Lowry came to Washington University in 1947 and chaired the Department of Pharmacology from 1947 to 1976. He was Dean of the School of Medicine from 1955-1958. He became an Emeritus Professor in 1979, and served as acting Department Chair from 1989-1990. He remained an active member of the Department through 1994.

Special Seminars

In March, the Center of Regenerative Medicine hosted Dr. Arturo Alvarez-Buylla, Heather and Melanie Muss Professor in the Department of Neurological Surgery at the University of California, San Francisco, who presented the Fourth Distinguished Lecture in Regenerative Medicine.

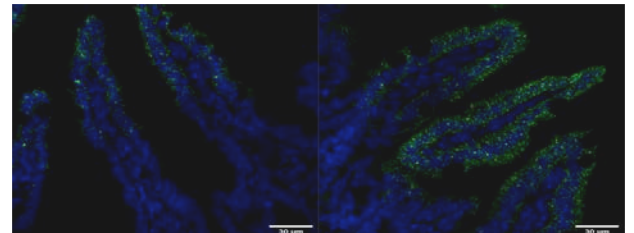


Talk Title: “Adult neural stem cell origin and self-renewal: Does brain size matter?”

Throughout the year, opportunities arise for special seminars, which are often co-hosted with other centers and departments.



Submission to the image contest from David Ornitz entitled “Mouse Skeleton stained with alcian blue and alizarin red”



Submission to the image contest from Sarah Waye (Morris lab) entitled “Creb3l3 supports regional reprogramming of the mouse intestine”



2020 Holiday Party

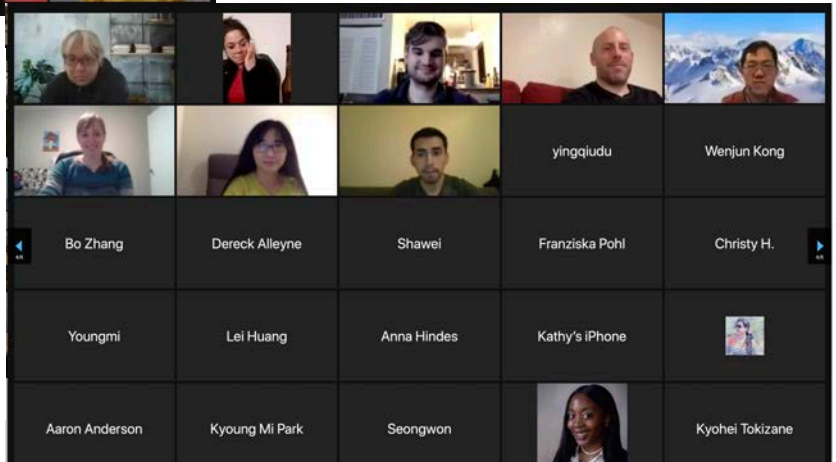
Pandemic Style December 15, 2020



More than 100 department members tuned in to celebrate the season together. The group enjoyed music by Rowan Karvas and Sebastian Buhts, an address by Lila Solnica-Krezel and award presentations for length of service, Boime and Covey Fellowships as well as the Boime Publication Award.



WU Center of Reg Med @wustlcrn · Dec 15, 2020
 Counting down to the @WashUDevBio holiday party tonight. I've got my White Box Catering goodies and my @SolnicaKrezelL sparkling wine 🍷
 @morris_lab @MokalledLab @AaronJohnsonLab



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Submission to the image contest from Mayssa Mokalled



To make a gift or for more information, please contact the Washington University Medical Alumni and Development Office at (314) 935-9691 or by email at: meddev@wustl.edu

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On December 17, 2019, faculty, postdocs, students and staff enjoyed a holiday celebration at The Sheldon Concert Hall's, Louis Spiering Room.