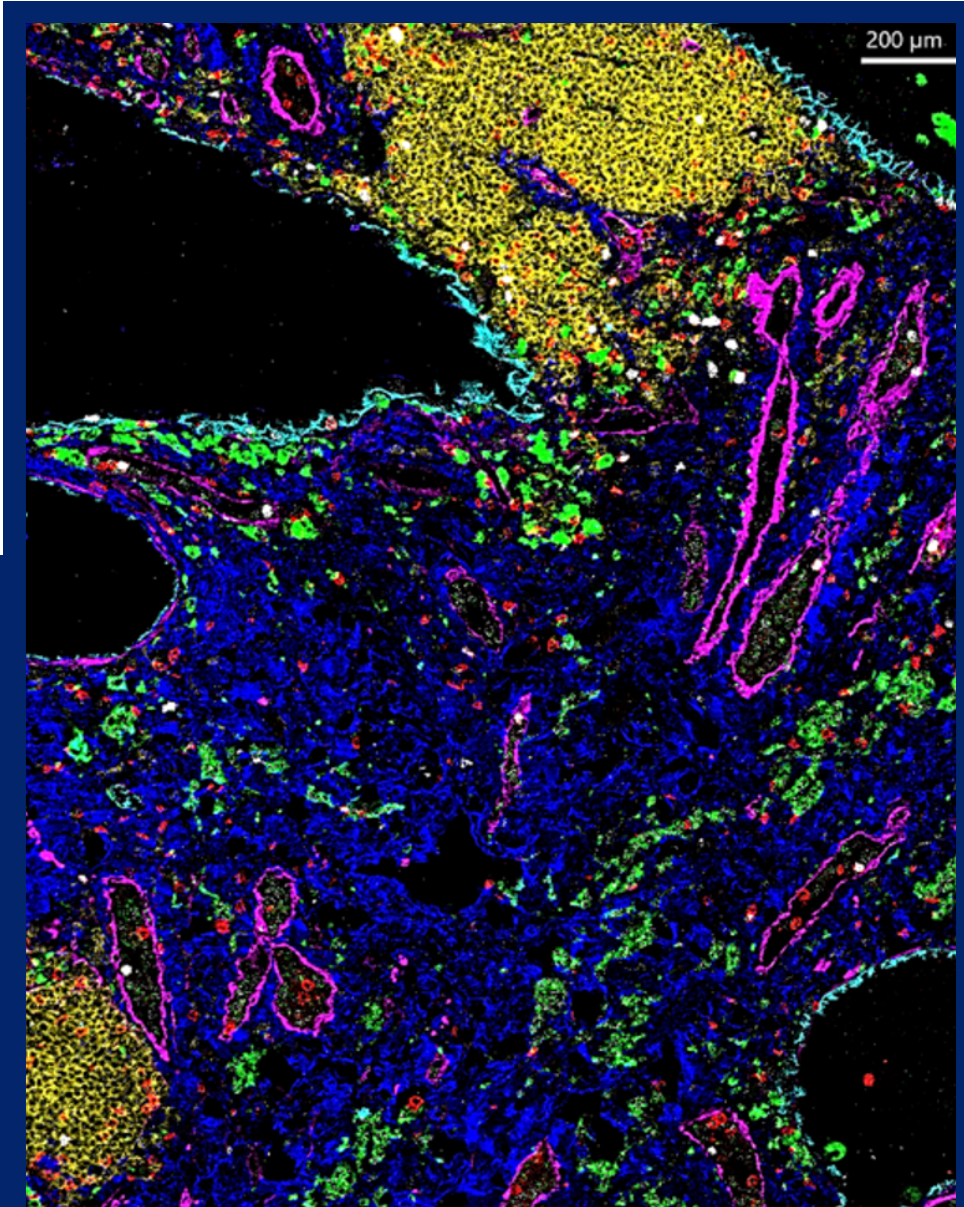


Baylor  
College of  
Medicine

THE MARGARET M. AND ALBERT B. ALKEK

DEPARTMENT OF  
MEDICINE

CULTIVATING BIOMEDICAL LEADERS  
THROUGH INNOVATIVE RESEARCH



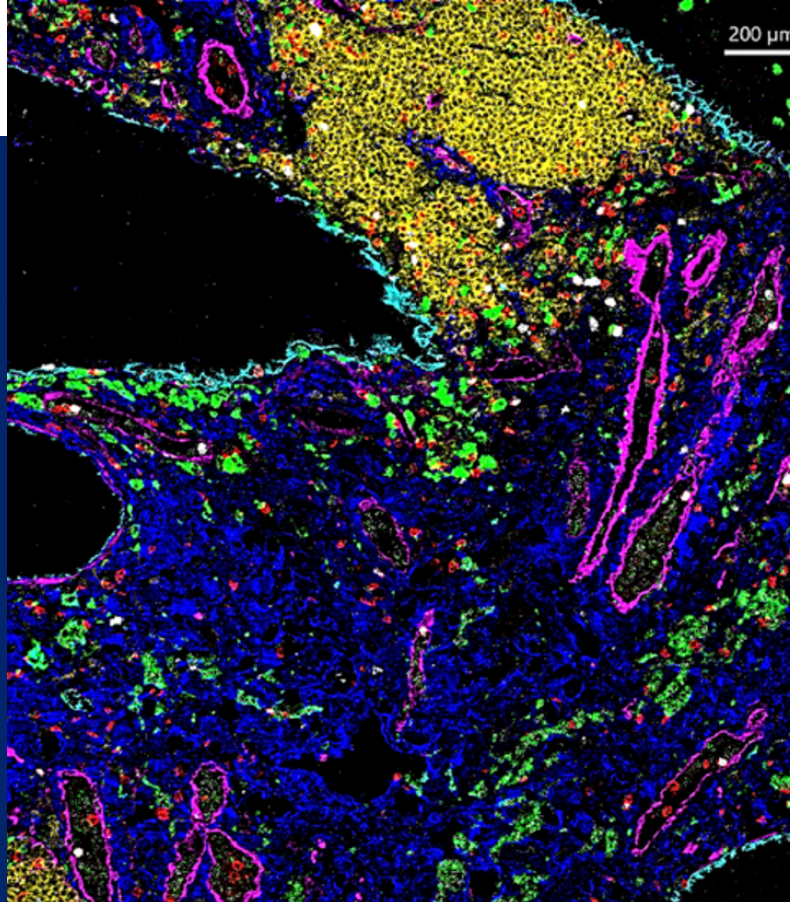
SECOND ANNUAL  
**NANCY CHANG, PhD**  
**RESEARCH SYMPOSIUM**

MARCH 18, 2024 | CULLEN AUDITORIUM



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Cover photo captured by:  
**Francesca Polverino, MD, PhD**  
*Lester and Sue Smith Associate Professor*

# ACKNOWLEDGMENTS

## PLANNING COMMITTEE

**Hashem El-Serag, MD, MPH** | Margaret M. and Albert B. Alkek Professor and Chair, Department of Medicine, Baylor College of Medicine, Vice President of the Learning Health System

**Rolando Rumbaut, MD, PhD** | Professor and Vice Chair for Research, Department of Medicine, Baylor College of Medicine

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# AGENDA

Monday, March 18, 2024 | 8:30 am – 3:45 pm

## Symposium | Cullen Auditorium

**8:30 AM** Coffee and Check-In

### *Welcome and Introductions*

**9:00 AM** **Rolando Rumbaut, MD, PhD**, Professor and Vice Chair for Research, Department of Medicine, Baylor College of Medicine

**9:05 AM** **Paul Klotman, MD**, President, CEO, and Executive Dean, Baylor College of Medicine

**9:10 AM** **Mary Dickinson, PhD**, Senior Vice President and Dean of Research, Baylor College of Medicine

**9:15 AM** **Hashem El-Serag, MD, MPH**, Margaret M. and Albert B. Alkek Professor and Chair, Department of Medicine, Vice President of the Learning Health System, Baylor College of Medicine

### *Keynote Address: Shaping the Next Generation of Biomedical Innovators*

**9:20 AM** **Joseph Petrosino, PhD**, Professor and Chair, Department of Virology and Microbiology, Chief Scientific Innovation Officer, Baylor College of Medicine

### *Founder's Address*

**9:50 AM** **Nancy Chang, PhD**, President, The Tang Family Foundation; Adjunct Professor, Baylor College of Medicine

**Break | 10:05 AM – 10:20 AM**

### *Single-Cell Ex Vivo Precision-Cut Lung Slices (PCLS) and Fibrosis Drug Discovery*

**10:20 AM** **Ivan Rosas, MD**, Professor and Section Chief, Section of Pulmonary, Critical Care, and Sleep Medicine, Department of Medicine, Baylor College of Medicine

### *Leveraging Integration of Multi-Omics to Identify B Cell-Based Therapies in Chronic Obstructive Pulmonary Disease (COPD)*

**10:45 AM** **Francesca Polverino, MD, PhD**, Lester and Sue Smith Associate Professor, Section of Pulmonary, Critical Care, and Sleep Medicine, Department of Medicine, Baylor College of Medicine

### *Targeting Inflammasome Signaling as Potential Therapy for Atrial Myopathy and Arrhythmias*

**11:10 AM** **Na Li, PhD**, Associate Professor, Section of Cardiovascular Research, Atherosclerosis and Vascular Medicine Division, Department of Medicine, Baylor College of Medicine

### *Novel Treatment for Coagulopathy and Disseminated Intravascular Coagulation (DIC)*

**11:35 AM** **Miguel A. Cruz, PhD**, Professor and Division Chief, Section of Cardiovascular Research, Thrombosis Research Division, Department of Medicine, Baylor College of Medicine

### *Closing Remarks*

**12:00 PM** **Rolando Rumbaut, MD, PhD**, Professor and Vice Chair for Research, Department of Medicine, Baylor College of Medicine

**General Attendee Lunch\* | 12:00 PM – 1:30 PM**

(\*Concurrent Meet the Founder Luncheon by invitation only)

## Poster Session | Rayzor Lounge

**1:30 PM** Poster Presentations, Session I

**2:30 PM** Poster Presentations, Session II

**3:30 PM** Poster Session Awards and Closing

**Reception and Dinner | 5:30 PM (by invitation only)**

# OVERVIEW

The Margaret M. and Albert B. Alkek Department of Medicine at Baylor College of Medicine is delighted to host the second annual Nancy Chang, Ph.D. Research Symposium on March 18, 2024. This symposium seeks to recognize the scientific achievements and philanthropic contributions of Dr. Chang to Baylor College of Medicine, and to highlight ongoing research conducted by selected Baylor College of Medicine investigators aligned with the theme of: "Cultivating Biomedical Leaders Through Innovative Research."

Below is a list of current Baylor College of Medicine faculty member recipients of research support from Dr. Chang.

## **Nancy Chang, PhD Professorships and/or Endowed Chairs**

David Corry, MD, Professor, Biology of Inflammation Center, Medicine (Former Professorship)

Farrah Kheradmand, MD, MS, Professor, Biology of Inflammation Center, Medicine (Professorship)

Andrew Rice, PhD, Professor, Molecular Virology and Microbiology (Professorship)

Sanjiv Sur, MD, Professor, Biology of Inflammation Center, Medicine (Endowed Chair)

## **Nancy Chang, PhD Awards for Research Excellence**

(2013) Mirjana Maletic-Savatic, MD, PhD, Associate Professor, Pediatrics

(2014) Joel Neilson, PhD, Associate Professor, Integrative Physiology

(2015) Joshua Shulman, MD, PhD, Professor, Neurology

(2016) David Durgan, PhD, Assistant Professor, Integrative Physiology

(2017) Sanjiv Harpavat, MD, PhD, Associate Professor, Pediatrics

(2018) Shinya Yamamoto, DVM, PhD, Assistant Professor, Molecular & Human Genetics

(2019) Melanie Samuel, PhD, Associate Professor, Neuroscience

(2020) Sean Hartig, PhD, Associate Professor, Medicine

(2020) Atul Maheshwari, MD, Associate Professor, Neurology

(2021) Bruno Di Stefano, PhD, Assistant Professor, Molecular & Cellular Biology

(2022) Jill Weatherhead, MD, PhD, Assistant Professor, Pediatrics

# About

# NANCY CHANG, PhD

Dr. Nancy Chang is a Taiwanese American biochemist, entrepreneur, business executive and philanthropist. She completed her undergraduate studies at Taiwan National Tsing Hua University and Brown University and attended the Ph. D. program at the Division of Medical Sciences at Harvard Medical School as one of the first few international students. With a Ph.D. in biochemistry and her pioneering postdoctoral research work at Roche on interferons, Nancy joined the founding team at Centocor, where she served as director of research and made substantial contributions to the development of monoclonal antibody as therapeutics and to the HIV field including the development of the first HIV diagnosis assay. Centocor was later acquired by Johnson & Johnson and formed the foundation of Janssen Biotech.



In 1986, Nancy moved to Houston and joined Baylor College of Medicine, where she served as Associate Professor of Virology until 1991. During this tenure, Nancy co-founded Tanox, with a vision to treat immunological diseases including allergy, asthma, and inflammation by using antibodies as a therapeutic agent. With Nancy serving as Chairman and CEO, Tanox achieved the then largest IPO in 2000 on NASDAQ and launched Xolair in 2003, the first biotech product cleared for treating patients with moderate and severe asthma. Tanox was acquired in 2007 by Genentech for \$919 million.

Afterward the sale of Tanox, Nancy led OrbiMed's Asia fund as the chairman, founder and managing director. She served on the board of directors for various institutes including the Federal Reserve Bank in Houston, BioHouston, Biotechnology Innovation Organization (Bio), Charles River Laboratories, and several biotech companies. Throughout her career, she received numerous awards from academic, industrial, national and international organizations. She was named the Most Respected Woman in Biotechnology in 2005, Forbes Twenty-Five Notable Chinese Americans list in 2008 and was the first woman to receive the Biotechnology Heritage Award in 2012.

During her 40-year tenure in the biotechnology industry, Nancy has developed and commercialized several highly successful diagnostic and therapeutic products for cancers, HIV infection and for treating inflammatory disease including Crohn's disease, ulcerative colitis, psoriasis, rheumatoid arthritis, atopic dermatitis, allergy and asthma. In 2018, Trogarzo was approved by the FDA for HIV treatment. Trogarzo was originally developed by Tanox as TNX-355 under Dr. Chang. Even today, there are breakthrough drugs which are coming to the market due to Dr. Chang's work. In 2020, Lilly paid \$1.1 billion to acquire Dermira for the anti-IL-13 antibody lebrikizumab. Lebrikizumab was TNX-650. The drug was developed at Tanox under Dr. Chang. Lilly reported the drug's success in two phase 3 clinical trials in treating moderate-to-severe atopic dermatitis in late 2021. Lebrikizumab was approved by the European Medicines Evaluation Agency (EMA) in 2022 and is anticipated to gain FDA approval in the near future. In addition, Tanox's anti-tryptase antibody is in phase III clinical development by Genentech for IgE-independent severe asthma.

Currently, Nancy serves as president of the Tang Family Foundation and dedicates her time to supporting the development of novel scientific breakthroughs aimed at treating unmet medical needs.

# MEET THE SPEAKERS

Welcome and Introductions | 9:00 AM



**Rolando Rumbaut, MD, PhD**

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Professor and Vice Chair for Research,  
Department of Medicine, Baylor College of Medicine



**Paul Klotman, MD**

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President, CEO, and Executive Dean,  
Baylor College of Medicine



**Mary Dickinson, PhD**

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Senior Vice President and Dean of Research,  
Baylor College of Medicine



**Hashem El-Serag, MD, MPH**

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Margaret M. and Albert B. Alkek Professor and Chair,  
Vice President of the Learning Health System,  
Department of Medicine, Baylor College of Medicine





## Keynote Address: Shaping the Next Generation of Biomedical Innovators

### Joseph Petrosino, PhD

*Professor and Chair, Department of Virology and Microbiology,  
Chief Scientific Innovation Officer, Baylor College of Medicine*

Commercializing academic innovations generated from the lab, clinic, or classroom is fraught with numerous challenges that every institution must address to increase chances for successful outcomes. While all eyes are on the financial return of these endeavors, expecting profits to flow from the outset of any commercialization enterprise is unrealistic. A robust pipeline of technologies at various stages of advancement is needed to increase the chances for success. To create such a pipeline at academic institutions, a foundational culture of commercialization is needed so that faculty, staff, and trainees are educated, empowered, and incentivized to participate in the translation of their discoveries. Such a culture change is fueled by a mission-aligned commercialization program that communicates the process and builds trust with the faculty, while also funding commercial-ready technologies, so that both entrepreneurs and their technologies are best-positioned for success.



### Founder's Address

### Nancy Chang, PhD

*President, The Tang Family Foundation;  
Adjunct Professor, Baylor of College of Medicine*

**Break | 10:05 AM – 10:20 AM**



### Single-Cell Ex Vivo Precision-Cut Lung Slices (PCLS) and Fibrosis Drug Discovery

### Ivan Rosas, MD

*Professor and Section Chief, Section of Pulmonary, Critical Care, and Sleep Medicine, Department of Medicine, Baylor College of Medicine*

Idiopathic pulmonary fibrosis (IPF) is a disease with poor clinical outcomes. Although antifibrotics can reduce disease progression, their use is limited by toxicity. Single-cell genomics has improved our ability to define aberrant cell phenotypes, transitional states, and cellular cross-talk that could be targeted by novel therapeutics and inform drug development. Our studies utilize the IPF cell atlas to define the in vivo effect of approved antifibrotic therapy and to test novel therapeutic targets using ex vivo human precision-cut lung slices. This approach will improve drug discovery and advance therapeutic programs in patients affected with this devastating disease.



## Leveraging Integration of Multi-Omics to Identify B Cell-Based Therapies in Chronic Obstructive Pulmonary Disease (COPD)

Francesca Polverino, MD, PhD

*Lester and Sue Smith Associate Professor, Section of Pulmonary, Critical Care, and Sleep Medicine, Department of Medicine, Baylor College of Medicine*

Chronic Obstructive Pulmonary Disease (COPD) is a multifactorial disease that encompasses several phenotypes. Emphysema is one of the major COPD phenotypes, and is characterized by off-targeted B cell activation with autoimmune features. Dr. Polverino's research group leverages the integration of multi-omic techniques to identify immune therapies targeting the B cell population in pulmonary emphysema.

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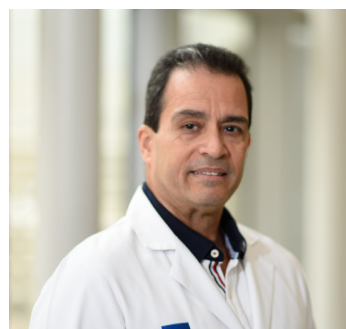
## Targeting Inflammasome Signaling as Potential Therapy for Atrial Myopathy and Arrhythmias

Na Li, PhD

*Associate Professor, Section of Cardiovascular Research, Atherosclerosis and Vascular Medicine Division, Department of Medicine, Baylor College of Medicine*

Inflammatory biomarkers are associated with the development of atrial fibrillation and atrial myopathy, conditions that can increase the risk of stroke and heart failure. Employing genetically-modified mouse models, we have established the causative role of innate inflammatory signaling, specifically the NLRP3 inflammasome, in the pathophysiology of atrial fibrillation. We also performed proof-of-concept studies in pre-clinical models showing that anti-inflammatory strategies could alleviate the risk of atrial fibrillation and atrial myopathy in cohorts with a heightened risk of inflammation.

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## Novel Treatment for Coagulopathy and Disseminated Intravascular Coagulation (DIC)

Miguel A. Cruz, PhD

*Professor and Division Chief, Section of Cardiovascular Research, Thrombosis Research Division, Department of Medicine, Baylor College of Medicine*

Persistent systemic inflammation as seen in endotoxemia, sepsis, bacteremia and viral infections can induce coagulopathy, which precedes disseminated intravascular coagulation (DIC). When it is severe and lengthy, organ failure arises, causing death. The widespread formation of fibrin clots is a hallmark in patients with systemic inflammation associated with coagulopathy and microvascular thrombosis. Our candidate drug (A2 protein) targets fibrin (the product of coagulation), affecting the resultant fibrin clot structure and its degradation. Importantly, the A2 protein does not increase the risk for bleeding. Additionally, the A2 protein has shown beneficial effects in animal models for other thrombo-inflammatory diseases.

# POSTER PRESENTATIONS

Rayzor Lounge | 1:30 PM - 3:45 PM

# Session 1 | 1:30 PM

*Bolded names indicate presenter*

- 1 **J. Deger**, S. Hannan, M. Gu, O. Kanca, L. Goodman, M. Hamdan, W. W. Lin, L. Ma, Y. Li, M. Ge, I. Al-Ramahi, J. Botas, A. Milosavljevic, H. Bellen, & J. Shulman. ***In Vivo Functional Dissection of Alzheimer's Disease Genetic Risk.***
- 3 **Y. Wu**, F. M. Green, S. A. Shaw, L. J. Bonilla, S. E. Ronca, M. E. Bottazzi, F. Kheradmand, & J. Weatherhead. ***SARS-CoV-2 Triggers Dickkopf-1 (Dkk-1) Modulation of T Helper Cells and Lung Pathology in Mice.***
- 5 C. Coarfa, S. L. Grimm, L. Stertz, J. Kimata, P. Gunaratne, **A. Rice**, & C. Walss-Bass. ***Elucidating the Cell Specific Non-Coding Transcriptome in Prefrontal Cortex After HIV-1 Infection.***
- 7 **E. Anaya**, S. Pangas, & S. Hartig. ***'Fatless' Mice Reveal Fundamental Aspects of Adipose Tissue to Ovary Communication.***
- 9 **E. J. Park**, Y. Cui, F. Levin, C. Sands, C. Le Roux, M. Bartels, E. Van Nostrand, & B. Di Stefano. ***Regulation of RNA Editing Safeguards Human Cell Identity.***
- 11 **L. Altidor**, S. Osenberg, L. Parkitny, L. Bronk, F. Guan, M. Waleed Gaber, D. Grosshans, D. Young, & M. Maletic-Savatic. ***Optimizing and Evaluating the Efficacy of TLX Agonists on TLX Expression in Human Brain Organoids as a Potential Therapeutic Target for Neurogenesis.***
- 13 **C. J. Ballester-Rosado**, G. Capuccio, & M. Maletic-Savatic. ***Altered Neuronal Network Dynamics in Brain Organoids from MECP2 Duplication Syndrome Patients.***
- 15 **R. Mishra**, V. Gutterez, G. Timpone, & M. Maletic-Savatic. ***Targeting TLX/NR2E1 to Induce Neurogenesis and Improve Cognition in Alzheimer's Disease Mouse Model.***
- 17 **L. Bimler**, Y. Wu, K. Mauk, Y. Ko, B. Deneen, J. Naglik, B. Hube, & D. B. Corry. ***Developing a Chronic Model of Candida albicans Cerebral Mycosis Through Gut Colonization.***
- 19 **D. Armstrong**, C. Y. Chang, M. J. Hong, Y. Shen, A. Carisey, X. H. F. Zhang, L. K. Green, D. R. Lazarus, S. W. Kang, H. S. Lee, D. Corry, & F. Kheradmand. ***MAGE-A4-Responsive Plasma Cells Promote Non-Small Cell Lung Cancer.***
- 21 **Q. Abdulwahab**, P. Andrade, & M. Samuel. ***Neuronal SIRPα Loss Modulates Microglia Phagocytosis in Alzheimer's Disease.***
- 23 **P. Sharma**, P. Andrade, & M. Samuel. ***Microglia-Neuron Communication in Vulnerable and Resilient Brain Regions.***
- 25 **J. D. Zhu**, V. Akhanov, & M. Samuel. ***Molecular Drivers of Neural Integrity in the Development of Non-Image Forming Visual Circuits.***
- 27 **K. Hosoki**, N. Tapryal, A. Govindhan, A. Chakraborty, T. K. Hazra, & S. Sur. ***NEIL2 Inhibits Th2 and Th17 Differentiation and Allergic Airway Inflammation.***
- 29 **H. Delgado-Seo**, J. W. Mok, G. Huang, H. A. Dierick, I. S. Maze, & S. Yamamoto. ***Investigating the In Vivo Functions of Histone 3 Monoamination Using Drosophila.***
- 31 **S. B. Gibson**, S. L. Deal, & S. Yamamoto. ***Investigating the Role of Hippo Signaling in Drosophila melanogaster Cuticle Pigmentation and Dopamine Metabolism.***

## Session 2 | 2:30 PM

*Bolded names indicate presenter*

- 2 **Y. Yuan**, X. Chen, P. Martsch, E. Martinez, J. Song, L. Li, D. Dobrev, & N. Li. ***Gasdermin D Promotes Atrial Arrhythmogenesis the Pyroptosis-Independent Mechanisms.***
- 4 K. K. Mahadevan, **V. S. LeBleu**, E. V. Ramirez, Y. Chen, B. Li, A. M. Sockwell, M. Gagea, H. Sugimoto, L. Kavitha Sthanam, D. Tampe, M. Zeisberg, H. Ying, A. K. Jain, R. A. DePinho, A. Maitra, K. M. McAndrews, & R. Kalluri. ***Elimination of Oncogenic KRAS in Genetic Mouse Models Eradicates Pancreatic Cancer by Inducing FAS-Dependent Apoptosis by CD8+ T Cells.***
- 6 **A. Misra**, C. D. Baker, E. M. Pritchett, & E. M. Small. ***Transcriptional Analysis of Neonatal Cardiac Regeneration and Scar Resolution.***
- 8 **J. Rojas-Quintero**, A. Colborg, C. Cong, J. Kue, N. Cortez-Santiago, M. C. Gazzaneo, J. Sucre, S. Abman, & F. Polverino. ***Club Cell Protein 16 Promotes Lung Development and Protects the Offspring Against Maternal Smoke-Induced Lung Damages.***
- 10 **A. Waich**, N. McKenna, S. A. Ochsner, B. J. Moss, J. D. Cala Garcia, R. Cardenas Castillo, F. Poli, D. Narendra, M. Ramineni, M. E. Ruiz Echartea, K. Kato, L. Hecker, C. Coarfa, & I. O. Rosas. ***Aberrant Signaling and Communication in the Alveolar-Capillary Niche in Bacterial Pneumonia-Induced Acute Respiratory Distress Syndrome (ARDS).***
- 12 **J. A. Courson**, R. E. Rumbaut, & A. R. Burns. ***Impact of Obesity and Age on Mouse Corneal Innervation at the Epithelial-Stromal Interface.***
- 14 **M. A. Gonzalez-Gonzalez** & M. Maletic-Savatic. ***The Autonomic Brain-Multiorgan Response in Hypertension.***
- 16 **S. Osenberg**, L. Parkitny, L. Bronk, L. Altidor, A. LaGrone, A. Trostle, J. D. Jia, F. Guan, M. Waleed Gaber, Y. W. Wan, H. Chen, Z. Liu, D. Grosshans, D. Young, & M. Maletic-Savatic. ***Human Forebrain Organoid Model for Studying the Effect of Space Radiation on Neurogenesis.***
- 18 **K. Mauk**, L. Bimler, M. Lorenz, J. Naglik, B. Hube, & D. B. Corry. ***Long-Term Persistence of Candida albicans in the Murine Gastrointestinal Tract.***
- 20 **Y. Zhang** & F. Kheradmand. ***Disturbances of Tissue Macrophages in Acute Lung Injury.***
- 22 **V. Akhanov**, J. H. Liang, D. Jiang, & M. Samuel. ***Non-Canonical Dopaminergic Neurons Drive Intraretinal Vascular Development.***
- 24 **M. Tawfik** & M. Samuel. ***Neuronal SIRPα Drives Retinal Vasculature Development.***
- 26 **A. Govindhan**, K. Hosoki, A. Rodriguez, T. Hazra, & S. Sur. ***Epithelial cGAS Induce Th2/Th17 Cells Associated Allergic Airway Inflammation in Mice.***
- 28 **J. Brown**, S. Gibson, H. R. Mendez, C. Reuter, S. Marwaha, D. Bonner, J. Kohler, E. Kravets, Undiagnosed Diseases Network, O. Kanca, M. F. Wangler, H. Bellen, E. A. Ashley, D. B. Montgomery, J. A. Bernstein, M. T. Wheeler, & S. Yamamoto. ***Exploring the Function of a Missense Variant in WWC3 as a Potential Candidate for a Novel Mendelian Disease Using Drosophila.***
- 30 **H. A. Dostalík**, J. W. Mok, O. Kanca, Y. Shen, C. L. Welch, Center for Precision Medicine Models (CPMM), M. F. Wangler, H. J. Bellen, W. K. Chung, & S. Yamamoto. ***Investigating the Role of Rare Genetic Variants in BMP Signaling Pathway Genes in Neurological Diseases Using Drosophila.***
- 32 **H. Hashimoto**, S. L. Deal, O. Kanca, K. Yokoi, & S. Yamamoto. ***Functional Analysis and Classification of Rare Genetic Variants in SATB2 Using Drosophila.***