

# AGING INSTITUTE



University of  
Pittsburgh

DEPARTMENT OF MEDICINE

ANNUAL REPORT | **FY20**



# AGING INSTITUTE ANNUAL REPORT

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## TABLE OF CONTENTS

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Message from the <b>Director</b>	3
<b>Faculty</b> Listing	4
<b>Research</b> Activities	6
<b>Grants and Contracts</b> Awarded	20
<b>Teaching</b> Activities	23
One-Year <b>Bibliography</b>	27
<b>Acknowledgments</b>	30



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# AGING

## INSTITUTE

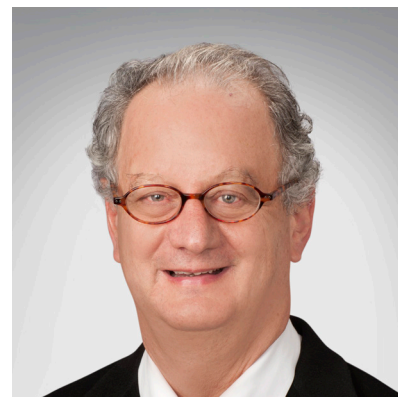
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In its current form, the Aging Institute of the University of Pittsburgh/UPMC represents one of the largest and most innovative organizations in the world centered on aging biology.

In 2019, for the first time in human history, the number of people on the planet over the age of sixty-five exceeded the number of people under the age of five. Moreover, in the US, in the next 40 years, the number of seniors will likely double, with an expected 95 million Americans over the age of 65 by 2060. The Aging Institute brings together scientists who seek to uncover the basic mechanisms underlying human aging and to develop novel therapeutic strategies to slow or reverse the aging process. Within our walls, researchers are hoping to solve the greatest unanswered biological puzzle-how and why do we age? The answer to that question will likely provide a completely new set of therapies that can help delay or prevent a wide range of age-related diseases and provide not necessarily a longer life, but rather, a life free of debilitating diseases.

The Aging Institute received a significant investment from UPMC Immune Transplant and Therapy Center (ITTC) and the University of Pittsburgh to expand the basic biology of aging program. As part of this commitment, approximately 30,000 ft<sup>2</sup> of laboratory and office space was renovated at Bridgeside Point 1 expanding the Aging Institute to now house the laboratories of 14 talented Principal Investigators in a highly collaborative and interactive environment. Our research focuses on the basic biology of aging, such as the role of DNA damage, as well as age-related diseases, including Alzheimer's disease and atherosclerosis. The strength of our Institute lies with our multidisciplinary team of scientists who have primary appointments within various basic science departments and clinical divisions.

In September 2019, the Aging Institute welcomed **Matthew Steinhauser, MD**. Prior to joining us, Dr. Steinhauser was an Assistant Professor at Harvard Medical School and an Associate Member of the Broad Institute, where he studied adipose tissue biology and its role in the regulation of metabolism and metabolic diseases. His laboratory has also pioneered the medical use of multi-isotope imaging mass spectrometry with recent cardiovascular applications have included dissecting heterogeneity in atherosclerotic plaque and delineating the level of adult cardiomyocyte division.



Toren Finkel, MD, PhD Director



**The Aging Institute is home to an on-site high throughput drug discovery facility that allows for screening of various small molecules (drugs) that may have therapeutic benefit.**

In March 2020, with the arrival of the global COVID 19 pandemic, the Aging Institute, along with most other research labs at the University of Pittsburgh was forced to ramp down our research programs to continue only the most essential research including research on COVID 19. Believing that the most rapid and effective near term approach to block the spread of this disease is through identification of currently FDA approved drugs that can be re-purposed to block viral entry and infectious spread, researchers at the Aging Institute have been using our state-of-the-art high throughput chemical screening facility to identify a small subset of FDA approved compounds that effectively reduce the surface expression of TMPRSS2, a critical host protein required for efficient SARS-CoV-2 viral entry. Using both cell and animal models, they are attempting to determine which agents alone or in combination with other approved agents are most effective at blocking SARS-CoV-2 infection.

**Toren Finkel, MD, PhD**

Director, Aging Institute of UPMC Senior Services and the University of Pittsburgh  
Professor of Medicine, Division of Cardiology  
G. Nicholas Beckwith III and Dorothy B. Beckwith Chair in Translational Medicine

**Anne B. Newman, MD, MPH**

Clinical Director, Aging Institute of UPMC Senior Services and the University of Pittsburgh  
Chair, Department of Epidemiology  
Katherine M. Detre Endowed Chair, Population Health Sciences  
Director, Center for Aging and Population Health  
Professor of Epidemiology, Medicine, and Clinical and Translational Science

**Marta Bueno, PhD**

Research Assistant Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine

**Beibei (Bill) Chen, PhD**

Associate Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine  
Director, Small Molecule Therapeutic Center  
Co-Director, Acute Lung Injury Center of Excellence

**Yvonne S. Eisele, PhD**

Assistant Professor of Medicine, Division of Cardiology

**Daniel E. Forman, MD**

Professor of Medicine, Division of Geriatric Medicine  
Chair, Section of Geriatric Cardiology, UPMC  
Director of Emerging Therapeutics, Aging Institute

**Aditi U. Gurkar, PhD**

Assistant Professor of Medicine, Division of Geriatric Medicine

**Gang Li, PhD**

Assistant Professor of Medicine, Division of Cardiology





**Jie Liu, PhD**

Research Associate Professor of  
Medicine, Division of Cardiology

**Shihui Liu, MD, PhD**

Associate Professor of Medicine,  
Division of Infectious Diseases

**Yuan Liu, PhD**

Assistant Professor of Medicine,  
Division of Pulmonary, Allergy and  
Critical Care Medicine

**Ana L. Mora, MD**

Associate Professor of Medicine,  
Division of Pulmonary, Allergy and  
Critical Care Medicine

**Stacey J. Sukoff Rizzo, PhD**

Associate Professor of Neurobiology

**Shiori Sekine, PhD**

Assistant Professor of Medicine,  
Division of Cardiology

**Yusuke Sekine, PhD**

Assistant Professor of Medicine,  
Division of Endocrinology and  
Metabolism

**Matthew Steinhauser, MD**

Associate Professor of Medicine,  
Division of Cardiology

**Xiaojun (Jay) Tan, PhD**

Research Assistant Professor of Cell  
Biology

**Yong (Roy) Wan, PhD**

Research Assistant Professor of  
Medicine, Division of Endocrinology  
and Metabolism

**Bokai Zhu, PhD**

Assistant Professor of Medicine,  
Division of Endocrinology and  
Metabolism

## RESEARCH ACTIVITIES

The research mission of the Aging Institute is to: 1) understand the biological basis for human aging; 2) design and test small molecules that will enhance fundamental resilience to age; and 3) launch innovative clinical trials that target the fundamental biology of aging to test whether the rate of human aging is modifiable.

Our on-site faculty includes **Dr. Aditi Gurkar**, whose lab focuses on the role of DNA damage in the aging process; **Dr. Gang Li**, whose interest lies in developing new genomic technologies to understand a range of age-related human diseases; and **Dr. Yvonne Eisele**, who studies amyloid biology both in the heart and the brain. Other investigators include **Dr. Ana Mora**, whose lab focuses on the age-related, telomere-based disease Idiopathic Pulmonary Fibrosis; **Dr. Bill Chen**, who spearheads the drug discovery efforts at the Aging Institute; and **Dr. Yuan Liu**, whose interest lies in how metabolic pathways link to aging. The Institute also houses the laboratories of **Drs. Shiori and Yusuke Sekine**, whose interest lies in organelle quality control and intra-organelle signaling; **Dr. Shihui Liu**, who studies the intersection of aging and infectious disease; and **Dr. Bokai Zhu**, who is exploring non-circadian rhythms in mammalian biology. Additionally, our two most recent recruits are **Dr. Stacey Rizzo**, an expert on developing new models for Alzheimer's disease and using these models to test new therapies, and **Dr. Matthew Steinhauser**, whose research interest is in fat metabolism and in understanding the basis for human resilience. Research within the **Finkel** lab centers on understanding the pathways regulating mammalian aging with a focus on dissecting the role of mitochondria, metabolism, and autophagy/mitophagy in the aging process. Finally, in the Fall of 2020, **Dr. Andrey Parkhitko**, from Harvard Medical School, will join the Institute. Dr. Parkhitko studies how dietary restriction regulates lifespan.

### Grants

The Aging Institute's research portfolio includes grant support from federal, foundations and industry partners including the National Institutes of Health, UPMC Immune Transplant and Therapy Center (ITTC), the American Diabetes Foundation, The Pittsburgh Foundation, The Beckwith Institute, the Jewish Healthcare Foundation, and Boehringer Pharmaceuticals. New grants and research collaborations in FY20 include:

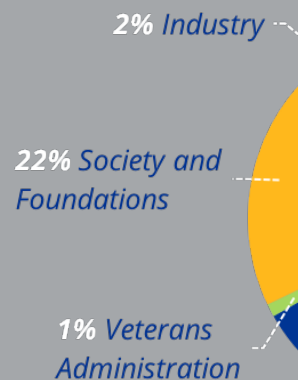
- **Toren Finkel, MD, PhD; Beibei Chen, PhD; and Yuan Liu, PhD**, "Identifica-

## RESEARCH

### BY THE NUMBERS

In FY20, the Aging Institute received a total of \$9.6m in research funding from the Public Health Service, the VA, various societies and foundations, and industry. Research expenditures exceeded \$9.1m, a 32% increase from FY19.

### GRANTS & CONTRIBUTIONS FY20







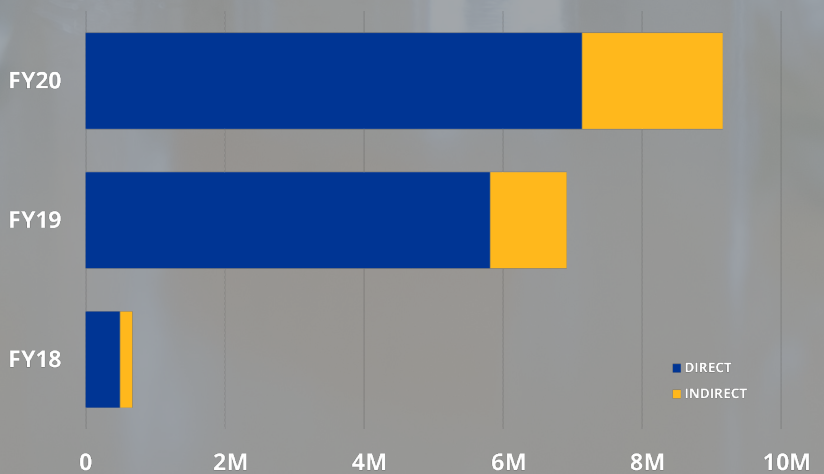
**TRACTS AWARDED**



*75% Public Health Service*

**RESEARCH EXPENDITURES**

*FY16-FY20*



tion and Phase I testing of FDA approved compounds for COVID-19”, Jewish Healthcare Foundation.

- **Toren Finkel, MD, PhD; Ana Mora, MD;** Panagiotis V Benos, PhD; **Robert A. Lafyatis, MD; Mauricio Rojas, MD:** Mapping Age-Related Changes in the Lung, NIH U01
- **Shihui Liu, PhD,** "Defining cellular receptors for the Bacillus cereus hemolysin BL toxin (HBL) and the development of anti-HBL therapies", NIH R01
- **Ana Mora, MD and Mauricio Rojas, MD,** "Senescence and the validation of new therapeutic concepts for lung fibrosis", Boehringer Ingelheim International GMBH
- **Ana Mora, MD,** and **Adam Straub, PhD,** "Type II Alveolar Redox Control In Fibrogenesis and Resolution, NIH R01
- **Stacey Rizzo, PhD,** "Role of Lifespan Intervention on the Regulation and Progression of Alzheimer's Disease", NIH R01
- **Matthew Steinhauser, MD,** "Functional evaluation of a new GWAS locus that links visceral adiposity and type 2 diabetes", NIH R01
- **Bokai Zhu, PhD,** "Hepatic 12h-to-24h reprogramming drives NAFLD", Pittsburgh Liver Center/NIH P30

Clinical research efforts for the Aging Institute are being led by Aging Institute Clinical Director, **Anne Newman, MD, MPH.** Dr. Newman brings a wealth of experience in studying human aging and oversees efforts designed to test the 'geroscience hypothesis,' which posits that therapies targeting the basic biology of aging can slow or reverse age-related diseases. **Dr. Dan Forman** joins Dr. Newman in this effort and is serving as the Associate Director for Clinical Translation and Director of Emerging Therapeutics. Together, they will help direct a series of innovative clinical trials, which are anticipated to launch in early 2021. The first of these trials, termed the RIGHT study, supported by The Beckwith Institute, has been approved by the FDA and will test whether immunomodulation can alter the course of human frailty.

## Publications, Talks, and Patents

Aging Faculty have also been invited to give a number of distinguished talks including:

- **Aditi Gurkar, PhD,** presented at the TEDx Pittsburgh Women Conference at the Roxian Theater in December 2019
- **Yvonne Eisele, PhD,** along with **Prem Soman, MD,** presented "From Bench to Bedside: Developments in Cardiac Amyloidosis" at the Frontiers in Molecular Imaging Symposium, University of Pittsburgh, in November 2019
- **Gang Li, PhD,** has been invited to speak at the Senior Vice Chancellor's Research Seminar on October 9, 2020

Aging Faculty have also published a number of manuscripts in high impact journals including:

- **Gang Li, PhD,** published a paper in *Nature Communications* that showed sequential application of Reel-seq, SDCP-MS, and AIDP-Wb can greatly help to translate large sets of GWAS data into biologically relevant information.
- **Shihui Liu, MD, PhD,** published work that outlines and validates an approach to use iterative genome-wide CRISPR-Cas9 screens to identify the complement of host factors exploited by bacterial toxins to exert their myriad biological effects in *Cell Host & Microbe*.
- **Shiori Sekine, PhD,** published a paper in *Molecular Cell* that showed  $\Delta\Psi$ m loss-dependent PINK1 import arrest does not result solely from Tim23 inactivation but also through an actively regulated "tug of war" between Tom7 and OMA1.
- **Matt Steinhauser, MD,** published a study that expands the practical use of MIMS for

cell biology by enabling measurements of metabolic function from stable isotope labeling within individual organelles in situ in *The Journal of Cell Biology*.

- **Jay Tan, PhD**, published a paper in *The Journal of Cell Biology* that reviewed progress in understanding how mitochondria serve as intracellular signaling platforms and how these signaling properties might potentially be exploited to develop new therapeutic strategies for a range of age-related conditions.

Drug discovery investigators at the Aging Institute (**Toren Finkel, MD, PhD, Beibei Chen, PhD, and Yuan Liu, PhD**) have filed five patents regarding their discoveries. In addition, these results have led to the formation of a biotechnology company, **Generian**, which is based on the work of the Aging Institute and seeks to bring two of these new drugs to the market by 2021.

## Research Centers

Finally, FY 2020, saw the launch of 2 new research cores led by Aging Institute faculty:

**Preclinical Phenotyping Core (PPC) Facility**, <https://ppc.dom.pitt.edu/> led by **Stacey Rizzo, PhD**, specializes in behavioral and physiological phenotyping of mice and rats. The PPC is located on the 5th and 6th floors of BST3. The core provides instrumentation and highly trained staff to support experiments as well as provide training to faculty, staff, and post-doctoral fellows. The PPC supports behavioral and physiological phenotyping across multiple disease domains with paradigms encompassing assays of aging; depression; anxiety; motivation; motor and sensorimotor; circadian and sleep; general exploratory and locomotor activity; nociception; social behavior; in vivo physiology; and a suite of cognition assays for learning, memory, and attention. The PPC house new state-of-the-art automated equipment including eight Accuscan open field arenas housed in sound-attenuating chambers; Lafayette Instruments touchscreen chambers for comprehensive translational cognition testing; San Diego Instruments acoustic startle and pre-pulse inhibition chambers; y-mazes arenas for short term and spatial working memory with Noldus Ethovision automated tracking; new grip strength and rotarod equipment; forty new wireless running wheels for mice; an optokinetics system for functional visual acuity testing; a DSI telemetry system with 8 receivers for continuous monitoring of biosignals from surgically implanted telemetry devices (EEG, blood pressure, glucose, etc). Faculty and research staff can contact the PPC for more information including consultations for experimental designs (selection of assays, appropriate sample sizes, etc), information to support preparation of grant budgets and grant text, as well as data analysis and interpretation.

The **Center for Human Integrative Physiology (CHIP)**, led by **Matthew Steinhauser, MD**, and **Pouneh Fazeli, MD**, (Division of Endocrinology and Metabolism), is housed on the 8th floor in UPMC Montefiore and includes ~1,010 sq. ft of dedicated space. This Center supports research investigating the detailed human response to relevant physiological perturbations (e.g., nutrient withdrawal, etc.) at the level of gene expression, metabolomics and other relevant 'omic' methodologies.

## Faculty Research Interests and Activities

### **Toren Finkel, MD, PhD** *Institute Director*

The Director of the UPMC-University of Pittsburgh Aging Institute and a Professor of Medicine in the Division of Cardiology, Dr. Finkel is a physician-scientist renowned for his research on the basic science of aging. For more than 20 years, his research group has focused on issues involved in mitochondrial function, cellular metabolism, oxidative stress, and aging. Due to the wide span of biological interests, his lab has developed expertise in mitochondrial assays, cell and molecular biology approaches, and the generation of mouse models along with whole-animal physiological measurements. A long-term goal is to uncover the molecular basis of mammalian aging and age-related diseases through the study of different cellular pathways, including stem cell self-renewal, reactive oxygen species, sirtuins, autophagy, mTOR signaling, and mitochondrial metabolism. A particular focus in the last several years has been the role that a decline in autophagy might phenocopy vascular aging. His lab has also developed novel strategies to measure mitophagy in vivo.

#### **Advisory Committee Memberships and Leadership Positions**

- Member, Steering Committee, NIH Bone Marrow Stromal Cell Transplant Center, 2010-present
- Member, Stromal Cell Transplantation Center, NHLBI iPS Oversight Committee, 2011-present
- Steering Committee, Immune Transplant and Therapy Center (ITTC), 2017-present
- Committee Member, Dickson Prize in Medicine, 2019-present

#### **Professional Affiliations and Society Memberships**

- Member, American Association of Physicians, 2009-present
- Fellow, American Association for the Advancement of Science, 2013-present
- Member, Association of American Physicians, 2016-present
- Alumni Association, Harvard Medical School, 2017-2020

#### **Editorships**

- Editorial Board, *IUBMB Life*, 2003-present
- Editorial Board, *Antioxidants and Redox Signaling*, 2003-present
- Editorial Board, *Mechanisms of Ageing and Development*, 2007-present
- Associate Editor, *Aging Cell*, 2008-present
- Editorial Board, *Clinical & Translational Science*, 2008-present
- Associate Editor, *Molecular Aspects of Medicine*, 2009-present
- Editorial Board, *Science*, 2015-present

#### **Major Lectureships and Seminars**

- Invited Speaker, Scleromerma Workshop, Cambridge, United Kingdom, August 2019
- Keynote speaker, TriMAD Symposium, Philadelphia, PA, September 2019
- Invited speaker, Molecular Biology of Aging, Groningen, Netherlands, October 2019
- Invited Speaker, University of Chicago, Committee on Molecular Metabolism (CMMN) Seminar, Chicago, IL, January 2020

### **Anne B. Newman, MD, MPH**

Dr. Newman is the Distinguished Professor and Chair of the Department of Epidemiology, with a secondary appointment as Professor of Medicine in Geriatrics. A member of NIH/NIA's National Advisory Council on Aging, she is Principal Investigator for several large population studies and clinical trials and also serves as Director of the Center for Aging and Population Health at the Graduate School of Public Health. In addition, she collaborates with Dr. Greenspan as Co-PI of our Pepper Center, with Dr. Hanlon in the Health ABC Study, and with Dr. Nadkarni on the LIFE Study and the ENRGISE Study. Her research focuses on the factors associated with disability and healthy aging.

### ***Advisory Committee Memberships and Leadership Positions***

- Member, Advisory Board, NIH/NIA Baltimore Longitudinal Study of Aging (BLSA), 2005-present
- Member, Scientific Advisory Board, The Irish Longitudinal Study of Aging (TILDA), 2009-present
- Member, External Advisory Committee, ALLHAT (Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial), 2011-present
- Member, External Advisory Committee, KURE (Korean Urban Rural Elderly) Study, 2012-present
- Member, National Advisory Council on Aging (NACA), National Institute on Aging, 2014-present

### ***Editorships***

- Editorial Board, *Journal of Aging and Health*, 2010-present
- Editor-in-Chief, *Journal of Gerontology: Medical Science*, 2016-present

## **Marta Bueno, PhD**

Dr. Bueno's research centers on unraveling the age-related mechanisms involved in the susceptibility to lung diseases, including idiopathic pulmonary fibrosis and pulmonary (arterial) hypertension, in particular. Her lab has a strong record of examining injury and repair mechanisms in the lung, including the responses of the aging lung to endoplasmic reticulum stress, senescence, and loss of mitochondrial homeostasis.

### ***Advisory Committee Memberships and Leadership Positions***

- Reviewer, Society for Redox Biology and Medicine Annual Conference, 2017-present
- Member, Committee, American Thoracic Society Interest Group on Aging in Critical Care, 2019-present

### ***Professional Affiliations and Society Memberships***

- Member, Spanish Society of Biochemistry and Molecular Biology, 2000-present
- Member, American Thoracic Society, 2011-present
- Member, Society of Redox Biology and Medicine, 2013-present
- Member, American Thoracic Society RCMB Web Committee, 2018-present

### ***Major Lectureships and Seminars***

- Invited Speaker, McGowan Institute Annual Scientific Retreat, March 2020
- Panelist, DOM PhD Committee Twitter Retreat, Department of Medicine, University of Pittsburgh, May 2020

## **Beibei (Bill) Chen, PhD**

Dr. Chen's primary research interest involves the study of the molecular mechanisms that control inflammation and cell proliferation via protein ubiquitination. He has identified and characterized more than 10 novel ubiquitin E3 ligases over the last four years. These works have been published in top-tier journals, including *Nature Immunology*, *Nature Medicine*, *Cell Reports*, *Science Translational Medicine*, and the *Journal of Experimental Medicine*. Dr. Chen's second area of research focus is small molecule drug design. Over the past five years, he has submitted 10 provisional patents related to novel anti-inflammatory/cancer compounds. In addition, he has successfully designed and synthesized a novel series of first-in-class small molecule FBXO3 protein inhibitors. One of his lead compounds, BC-1261, has passed preclinical PK/toxicity studies and was discussed at an FDA pre-IND meeting in May 2015. Recently, he has also designed a novel series of potent, selective PDE4, HECTD2, StamBP, Fbxo7, Fbxo48, FIEL1, DCN1 inhibitors that exhibit excellent activities in vivo. His long-term goal is to develop a new class of therapeutics that combat cancer and inflammatory diseases by focusing on novel mechanisms.

### ***Study Sections***

- Ad hoc reviewer, AFM Téléthon, 2012-present
- Reviewer, University of Pittsburgh Competitive Medical Research Fund, 2015-present

#### **Advisory Committee Memberships**

- Member, Pulmonary Medicine (PULM) Panel, Dept. of Veterans Affairs, 2016-present
- Co-Founder/COO, Generian Pharmaceutical, Inc, 2019-present

#### **Professional Affiliations and Society Memberships**

- Member, American Society of Biochemistry and Molecular Biology (ASBMB), 2011-present
- Member, American Thoracic Society, 2012-present

#### **Editorships**

- Ad hoc reviewer, Multiple journals (*American Journal of Respiratory Cell and Molecular Biology*, *Journal of Medicinal Chemistry*, *Journal of Biological Chemistry*, *Molecular Cancer Therapeutics*, *PLOS One*, *Journal of Clinical Investigation*, *Laboratory Investigation*, *American Journal of Respiratory and Critical Care Medicine*, *Nature Communication*, *BBA Molecular Cell Research*, *Cell Chemical Biology*), 2009-present
- Editorial Board, *Journal of Allergy and Therapy*, 2010-present
- Editorial Board, *American Journal of Respiratory Cell and Molecular Biology*, 2016-present

#### **Major lectureships and seminars**

- Invited Speaker, Department of EOH, University of Pittsburgh, January 2020

### **Yvonne S. Eisele, PhD**

The Eisele lab focuses on age-related amyloid diseases, such as Alzheimer's disease and cardiac transthyretin amyloidosis. Dr. Eisele's team is interested in characterizing the protein aggregates that cause these diseases and then delineating the molecular and cellular changes they elicit in affected tissue. The lab's goal is to identify novel biomarkers and therapeutic targets. It collaborates closely with the clinical team at the recently founded Cardiac Amyloidosis Center at the University of Pittsburgh and UPMC.

#### **Study Sections**

- Grant reviewer, French National Research Agency (ANR), 2013-present
- Grant reviewer, Alzheimer's Society UK, 2018

#### **Professional Affiliations and Society Memberships**

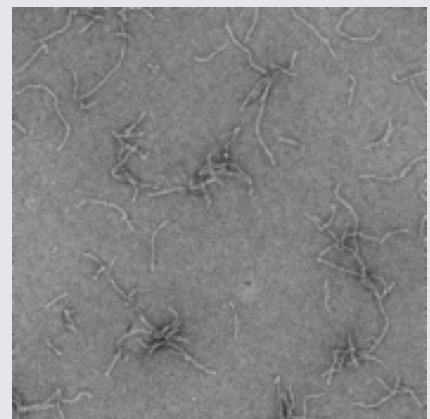
- Member, Society for Neuroscience (SfN), 2009-present
- Member, International Society to Advance Alzheimer's Research and Treatment (ISTAART), 2018-present

#### **Editorships**

- Ad hoc reviewer, Multiple journals (*Acta Neuropathologica*, *Neurobiology of Aging*, *EMBO Journal*, *American Journal of Respiratory and Critical Care Medicine*, *Alzheimer's Research and Therapy*), 2007-present

#### **Major Lectureships and Seminars**

- Invited Speaker, Symposium Frontiers in Molecular Imaging Symposium, University of Pittsburgh, November 2019
- Invited Speaker, Renal Research Seminar Series, University of Pittsburgh, April 2020



*Photo*  
Dr. Eisele's research is focused on amyloidosis, whose filamentous structure is shown above.

### **Daniel E. Forman, MD**

A Professor of Medicine, Dr. Forman is dually trained in geriatrics and cardiology. He holds appointments in both Divisions at UPMC as well as in both the Geriatrics Research Education and Clinical Center (GRECC) and the Cardiology Division at the Pittsburgh VA. With NIH funding, he is studying the benefit of nitrate capsules for fatigue and function in older adults with heart failure and pre-

served ejection fraction. In two other NIH projects, he is studying the impact of exercise on skeletal muscle gene transcription (Molecular Transducers of Physical Activity in Humans [MoTrPAC]) and the impact of exercise training on cognition (Investigating Gains in Neurocognition in an Intervention Trial of Exercise [IGNITE]). At the VA, he is comparing the impact of different training regimens (strength, aerobic, and inspiratory muscle training) on skeletal muscle morphology, gene expression, and functional capacity. He is also researching the utility of prehabilitation in frail elderly prior to abdominal and cardiothoracic surgery. Finally, Dr. Forman is funded by PCORI to devise novel strategies to improve cardiac rehabilitation, especially methods to improve enrollment, adherence, and value for complex, older cardiovascular patients.

#### ***Study Sections***

- Grant Reviewer, NIH/NHLBI, 2019
- Scientific Reviewer, NHLBI UG3/U24 study section, 2019
- Abstract Reviewer, American Heart Association National Meeting, Philadelphia, PA, 2019-2020
- Abstract Reviewer, American College of Cardiology National Meeting, New Orleans, LA, 2019-2020
- Program Committee Leader, American Association for Cardiovascular and Pulmonary Rehabilitation National Meeting, Portland, OR, 2019-2020
- Scientific Reviewer, VA Rehabilitation Research and Development Service, 2019-2020

#### ***Advisory Committee Memberships and Leadership Positions***

- Inaugural Chair and Member, Geriatric Cardiology Section, American College of Cardiology, 2009-present
- Chair, Advocacy Workgroup, Geriatric Cardiology Section, American College of Cardiology, 2014-present
- Chair, International Workgroup, Geriatric Cardiology Section, American College of Cardiology, 2014-present
- Member, Council on Clinical Cardiology–Council Leadership Committee, 2015-present
- Chair, Council on Clinical Cardiology, Older Populations Committee, American Heart Association, 2016-present
- Member, Council on Clinical Cardiology, Cardio Respiratory Fitness Registry, 2017-present
- Member, Healthy Lifestyle Institute, University of Pittsburgh, 2017-present
- Member, Program Committee, American College of Cardiovascular and Pulmonary Rehabilitation, 2018-2021
- Chair, cardiovascular track AACVR annual meeting (3-yr appointment), American Association of Cardiovascular and Pulmonary Rehabilitation, Chicago, IL, 2018-present
- Member, Tenured Faculty Promotions and Appointments Committee, University of Pittsburgh, 2018-present
- Member, Older Populations, American Heart Association, 2019-2020
- Advisory Panel, Veterans Affairs, Cooperative Studies Program Coordinating Center, 2020
- Member, Prevention Section, American College of Cardiology, 2020

#### ***Professional Affiliations and Society Memberships***

- Member, Data Safety and Monitoring Board, REHAB-HF, National Institute of Aging, 2014-present
- Committee Member, Cholesterol Guideline Committee (American Geriatric Society representative), Guideline committee, American College of Cardiology/American Heart Association, 2017-2019
- Faculty Member, F1000 Prime, Geriatric Cardiology, 2017-present
- Member, Medical Subspecialties Section, American Geriatrics Society, New York, New York, 2017-present
- Member, Research Committee, American Geriatric Society, 2018-2021
- Member, Executive Committee, Pittsburgh Claude D. Pepper Older Americans

- Independence Center, University of Pittsburgh, Pittsburgh, PA, 2018-present
- Member, American Geriatrics Society, 2019-2020
- Fellow, American College of Cardiology, 2020
- Fellow, American Heart Association, 2020
- Member, American Association of Cardiovascular and Pulmonary Rehabilitation, 2020

#### **Editorships**

- Guest Editor, *Clinics of Geriatric Medicine*, 2020
- Reviewer, *Journal of the American Geriatrics Society*, 2020
- Editorial Board, *Journal of Cardiopulmonary Rehabilitation and Prevention*, 2016-present
- Member, *Journal of the American Geriatrics Society, Cardiology*, 2016-present
- Editorial Board, *The Journal of Gerontology: Medical Sciences*, 2017-present
- Guest Editor, *Circulation*, 2017-present
- Guest Editor, *Journal of the American College of Cardiology*, 2018-present

#### **Major Lectureships and Seminars**

- Invited Participant, NIA: A Gerocentric Approach to Heart Failure with Preserved Ejection Fraction in Older Adults, Bethesda, MD, 2019
- Invited Speaker and Program Chair, NIA U13 conference, Washington, DC, 2019
- Invited Speaker and Chair of Cardiology Panel, Annual Update in Geriatric Medicine, University of Pittsburgh, Pittsburgh, PA, 2019
- Invited Speaker, Lifestyle Institute, University of Pittsburgh, Pittsburgh, PA, 2019
- Invited Speaker, Aging and Cancer Brainstorming Workshop, University of Pittsburgh, Pittsburgh, PA, 2019
- Invited Speaker, 15th International Congress of Update in Cardiology and Cardiovascular Surgery (UCCVS), The American Heart Association, Antalya, Turkey, 2019
- Invited Speaker, NHLBI Cardiovascular and Pulmonary Rehabilitation Investigators Meeting, Bethesda, MD, 2019
- Invited Speaker, Mid-Atlantic Capital Cardiology Symposium, Washington, DC, 2019
- Invited Speaker (3 presentations), American Association of Cardiovascular and Pulmonary Rehabilitation, Annual Meeting, Portland, OR, 2019
- Keynote Speaker, American Geriatrics Society, Annual Meeting, Portland, OR, 2019
- Meyers Visiting Professor of Geriatric Medicine, University of Massachusetts School of Medicine, Worcester, MA, 2019
- Visiting Professor, University of Vermont School of Medicine, Burlington, VT, 2019
- Invited Speaker, Lifespan Cardiology Grand Rounds, Brown University, Providence, RI, 2020
- Invited Speaker, Annual Update in Geriatric Medicine, University of Pittsburgh, Pittsburgh, PA, 2020
- Invited Speaker, GRECC, VAPHS, Pittsburgh, PA, 2020
- Invited Speaker, NHLBI Workshop, Bethesda, MD, 2020
- Invited Speaker, Barnes Jewish Hospital, Cardiovascular Grand Rounds, 2020 (cancelled due to COVID-19)

### **Aditi U. Gurkar, PhD**

Dr. Gurkar's interest is in understanding the biology of aging and age-related diseases. Her NIH-funded research focuses on identifying the signaling mechanisms that drive aging in response to endogenous DNA damage. By defining these molecular mechanism(s), she hopes to identify novel therapeutic targets that can be exploited to extend healthspan.

#### **Advisory Committee Memberships and Leadership Positions**

- Co-Preceptor, Grant-Writing Workshop, Department of Medicine, University of Pittsburgh, 2019



### **Editorships**

- Reviewer, Multiple journals (*eLife*, *Mechanisms of Aging and Development*, *PLoS One*, *DNA Repair*), 2014-present

### **Major Lectureships and Seminars**

- American Heart Association, American Heart Association Scientific Session, Philadelphia, PA, November 2019
- TEDx, Pittsburgh, PA, 2019
- Laidlaw Scholars, University of Oxford, Oxford, England, 2019
- International Student Congress of (bio)Medical Sciences, Netherlands, June 2020

### **Professional Affiliations and Society Memberships**

- Member, American Aging Association, 2019-present,
- Member, Society for Redox Biology and Medicine, 2019-present

### **Study Sections**

- Grant Reviewer, Aging Institute-Hillman Cancer Center Pilot Funds, 2019
- Judge, Smiddy Undergraduate Research Award (Florida International University), 2020
- Judging Committee, Department of Medicine Annual Research Day, 2020
- Grant Reviewer, The Dutch Research Council (NCO), 2020

## **Gang Li, PhD**

Dr. Gang Li's lab is conducting post-GWAS functional studies by identifying and characterizing the disease-associated functional SNPs and the fSNP-bound regulatory proteins. His team will collect all the functional data to build a disease-associated risk gene transcriptional regulation network for drug target identification.

### **Major Lectureships and Seminars**

- Invited Speaker, Alzheimer's Association International Conference, Los Angeles, CA, July 2019
- Invited Speaker, University of North Carolina, Chapel Hill, NC, 2020

## **Jie Liu, PhD**

Dr. Liu is a research associate professor who studies the biology of aging and the aging-related diseases using various cell biology approaches and various mouse genetic models. Currently, she is focusing on the generation and characterization of BioID2 transgenic mice, which are important tools in the study of in vivo alterations in proteins secretion and chronic inflammation during aging.

## **Shihui Liu, MD, PhD**

Dr. Liu investigates bacterial protein toxins, including anthrax toxins in pathogenesis, and develops therapeutics for the related diseases. In addition, he studies the signal transduction pathways, with special emphasis on the RAS-RAF-MEK-ERK pathway in cancer, and he is working to develop therapeutics for targeting these pathways for cancer therapy.

### **Editorships**

- Academic Editor, *Toxins* (an MDPI publication), 2013-present
- Academic Editor, *The Journal of Toxins*, 2013-present
- Journal Reviewer, *Oncotarget*, 2017-present
- Ad hoc reviewer, *Proceedings of the National Academy of Science of the USA*, 2019-present

## **Yuan Liu, PhD**

Dr. Liu's research focuses on the mechanistic study of TFEB protein degradation and small molecule TFEB activator development targeting age-related diseases, including neurodegenerative diseases and lung bacteria clearance. In addition, she participates in a joint effort to develop anti-inflammatory small molecules and autophagy activators.

**Study Sections**

- Reviewer, American Heart Association, 2017-present

**Advisory Committee Memberships and Leadership Positions**

- Member, University of Pittsburgh Competitive Medical Research Fund Committee, 2019-present

**Editorships**

- Ad hoc reviewer, Multiple journals (*The Journal of Biological Chemistry*, *The Journal of Allergy & Therapy*, *The Journal of Anesthesia & Clinical Research*, *American Journal of Respiratory Cell and Molecular Biology*, *Journal of Diabetes & Metabolism*, *PLOS One*, *Journal of Clinical Investigation*, *The American Journal of Physiology*), 2014-present

**Ana L. Mora, MD**

Dr. Mora is a research scientist with a strong record of examining the pathogenic mechanisms involved in the disrepair and fibrosis in the lung, including how aging-related cell perturbations contribute to this pathogenic process. Her group has made seminal contributions to the novel concept that mitochondrial dysfunction and alterations in mitophagy have a key role in idiopathic pulmonary fibrosis pathogenesis. Currently, the Mora lab is studying how mitochondrial dysfunction and metabolic adaptations to stress promote senescence and profibrotic responses.

**Study Sections**

- Permanent member, LIRR Study Section NIH, 2019-2025
- Ad hoc Reviewer, French National Research Agency (ANR), 2019-present

**Advisory Committee Memberships and Leadership Positions**

- Director, Small Animal Hemodynamic Phenotyping Core, Vascular Medicine Institute, University of Pittsburgh, 2014-present
- Elected member, Nominating committee, RCMB Assembly ATS, 2017-present
- Director of Education, Aging Institute, University of Pittsburgh, 2017-present
- Member, DOM PhD Task Force, 2019-present
- Chair, Cellular Aging in Lung Disease Seminar, Experimental Biology International Conference, 2020
- Member, Leadership Council, Vascular Medicine Institute, 2020-present

**Professional Affiliations and Society Memberships**

- Member, American Thoracic Society, 2002-present
- Member, Aging Committee, RCMB Assembly, ATS, 2012-present
- Member, Society for Free Radical Biology and Medicine, 2013-present
- Member, European Respiratory Society, 2019-Present

**Editorships**

- Academic Editor, *PLOS One*, 2012-present
- Editorial Board, *American Journal Respiratory Cell and Molecular Biology*, 2013-present
- Editorial Board, *American Journal of Physiology-Lung*, 2015-present

**Major Lectureships and Seminars**

- Invited Speaker, Symposium on Pulmonary Fibrosis, Henan Center of Pulmonary Fibrosis, China, 2019
- Invited Speaker, Physiology and Pharmacology Seminar Series, University of West Virginia, 2020
- Invited Speaker, Division of Pulmonary Seminar Series, Ohio State University, 2020

**Stacey J. Sukoff Rizzo, PhD**

Research in Dr. Rizzo's lab focuses on investigating the genetic contributions underlying the pathophysiological of diseases of Aging including Alzheimer's disease, neurodegenerative disorders, and

related neuropsychiatric and cognitive co-morbidities, in order to interrogate novel pathways and targets that may enable the identification of new therapeutic agents. Dr. Rizzo is a behavior pharmacologist by training and holds a BS in Animal Sciences from Rutgers University and a PhD in Neuroscience from University College London. She is an internationally recognized expert in behavioral phenotyping and pharmacology of genetic mouse models. Dr. Rizzo previously spent 18 years in the pharmaceutical industry in Neuroscience Drug Discovery departments at Wyeth Research, Merck Research Laboratories, Aventis Pharmaceuticals, and Pfizer where she led and contributed to many drug discovery projects across therapeutic areas. Prior to her current appoint, Dr. Rizzo served as Director of Mouse Neurobehavioral Phenotyping at The Jackson Laboratory's Institute for Mammalian Genetics (JAX) and Associate Director of JAX's Center for Biometric Analysis from 2014-2019. Dr. Rizzo's lab is a critical component of the NIA funded Model Organism Development for Late Onset Alzheimer's disease (MODEL-AD) consortium where she co-heads the Preclinical Testing Core which evaluates the potential therapeutic efficacy of novel test compounds for the treatment of Alzheimer's disease.

#### ***Study Sections***

- Reviewer, NIH Drug Discovery for the Nervous System Study Section, 2018-present
- Ad-hoc Reviewer, Tufts Clinical and Translational Science Institute (CTSI) Pilot Studies Program, 2019
- Ad-hoc Reviewer, Prader-Wili Syndrome Foundation Grant Program, 2019
- Ad-hoc Reviewer, Special Emphasis Panel/Scientific Review Group RRD6, 2020

#### ***Advisory Committee Memberships and Leadership Positions***

- Advisory Board, Alzheimer's disease Cooperative Study Compound Selection Committee, 2017-present
- Advisory Board Member, Prader-Wili syndrome Foundation Preclinical Animal Models Working Group, 2017-present
- Member, European Quality in Preclinical Data Stockholder Group (EQIPD), 2018-present
- Member, Alzheimer's Association International Conference (AAIC) Scientific Program Committee, 2019-2020
- Faculty Search Committee, University of Pittsburgh Alzheimer's Disease, 2019-present
- Member, Organizing Committee, Symposium on the Basic Research of Alzheimer's Disease, Pittsburgh, PA, 2020

#### ***Professional Affiliations and Society Memberships***

- Member, Society for Neuroscience, 1996-present
- Member, International Behavioral Neuroscience Society, 2015-present
- Member, Innovative Medicine Initiative, 2018-present
- Fellow Inductee, International Behavioral Neuroscience Society, 2020
- Member, International Society to Advance Alzheimer's Research and Treatment, 2020-present

#### ***Editorships***

- Review Editor, *Frontiers in Behavioral Neuroscience*, 2020

#### ***Major Lectureships and Seminars***

- Invited Speaker, Alzheimer's Association Meeting, NIA, Los Angeles, CA, July 2019
- Invited Speaker, Mental Health: Exploring the Adolescent Experience, The Florey Institute, Melbourne, Australia, July 2019
- Invited Speaker, National Laboratory for Animal Research, Taipei, Taiwan, July 2019
- Invited Speaker, Developmental Biology Department Symposia, University of Pittsburgh, December 2019
- Invited Speaker, Duquesne University Seminar, Pittsburgh, PA, December 2019
- Invited Speaker, University of New Mexico Conference, Albuquerque, NM, February 2020
- Invited Speaker, ORIP/NIH Workshop Validation of Animal Models (Virtual Meeting), May

2020

**Shiori Sekine, PhD**

Mitochondria dysfunction is associated with various diseases and aging. To maintain a healthy mitochondrial network, mitochondria are equipped with several systems that can evoke stress-signaling pathways. Dr. Sekine's lab studies the stress-sensing mechanisms of mitochondrial proteins and, in particular, the stress-dependent regulation of mitochondrial proteases and mitochondrial import machineries. Her research goal is to provide therapeutic targets for mitochondria dysfunction-related diseases through the manipulation of stress-signaling in mitochondria.

**Professional Affiliations and Society Memberships**

- Member, The Molecular Biology Society of Japan, 2006-present
- Member, The Japanese Biochemical Society, 2006-present

**Yusuke Sekine, PhD**

Dr. Sekine's research interests focus on understanding molecular mechanisms that underlie cellular responses to a variety of stresses, including oxidative, endoplasmic, and metabolic stresses. Using biochemical and cell genetic approaches, his lab is studying acetyl-CoA fluctuation-dependent functional changes of organelles (including nucleoli, mitochondria, and lysosomes) and the activation of organelle-associated signaling pathways. His team is working to understand the sensing mechanisms of metabolite fluctuations in mammalian cells and to reveal their relevance to human diseases and aging.

**Professional Affiliations and Society Memberships**

- Member, The Molecular Biology Society of Japan, 2004-present
- Member, The Japanese Biochemical Society, 2005-present

**Matthew Steinhauser, MD**

Director of the Center for Human Integrative Physiology at the Aging Institute, Dr. Steinhauser studies how metabolism is altered by aging and caloric excess and in turn contributes to metabolic diseases. One area of focus is on discovering the cellular and molecular defects in fat tissue that underpin an age dependent decline in the capacity to adapt to periods of excess calorie intake. Another area of focus is on understanding how human fasting may improve aging-related metabolic dysfunction.

**Advisory Committee Memberships and Leadership Positions**

- Member, Membership and Communication Committee, Council on Genomic and Precision Medicine, 2017-present

**Professional Affiliations and Society Memberships**

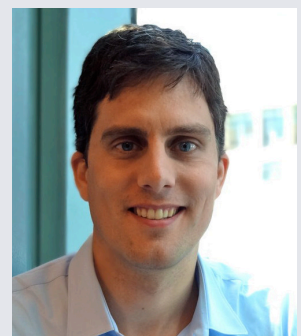
- Member, American Heart Association, 2010-present
- Member, Endocrine Society, 2013-present
- Member, American Diabetes Association, 2017-present

**Editorships**

- Reviewer, Multiple journals (*Analytical Chemistry, BMC Molecular and Cellular Biology, Cell Metabolism, Circulation, Current Opinion in Biotechnology, Diabetes, European Journal of Heart Failure, Hepatology, Journal of Clinical Investigation, Journal of Endocrinology, Journal of Internal Medicine, Journal of Thrombosis and Haemostasis, Methods, MethodsX, Molecular Medicine, Molecular Metabolism, Nature Communications, Science, Vascular Medicine*) 2010-present

**Major Lectureships and Seminars**

- Invited Speaker, Internal Medicine Innovation Grand Rounds, Brigham and Women's Hospital, 2019



*Photo*  
In September 2019, the Aging Institute and the Heart and Vascular Institute welcomed Matthew Steinhauser, MD.

- Invited Speaker, Renal Division Research Seminar Series, Brigham and Women's Hospital, 2019
- Invited Speaker, Models of Disease Bootcamp Invited Lecture, Harvard Medical School, 2019
- Invited Speaker, School of Medicine Board of Visitors Meeting, University of Pittsburgh, 2019
- Invited Speaker, Pepper Center Seminar, University of Pittsburgh School of Medicine, 2019
- Invited Speaker, Research Seminar, Boston University Cardiovascular Institute, Boston MA, 2019
- Invited Speaker, Career Development Award; American Heart Association Grant Review Committee, 2020

### **Xiaojun (Jay) Tan, PhD**

Dr. Tan's research focuses on basic molecular mechanisms underlying cell homeostasis and stress response. Currently, he is examining the underlying molecular mechanisms sensing, repairing, and clearance of damaged organelles in mammalian cells. Dr. Tan believes there is a unifying principle behind these complex stress response processes and that spatiotemporal lipid signaling is one such general principle with the longterm goal to identify the molecular basis of aging with a focus on lipid signaling and to develop pharmacological strategies to fight aging and age-related diseases.

#### ***Professional Affiliations and Society Memberships***

- Member, American Heart Association, 2012-present
- Member, American Society for Cell Biology, 2014-present
- Member, American Association for the Advancement of Science, 2017-present

### **Yong Wan, PhD**

Dr. Wan's primary research interest is to understand the molecular and cellular causes of aging-related bone disease - osteoporosis. Additionally, he also researches the cellular, molecular and morphogenetic causes underlying the development of a newborn bone disease, craniosynostosis (CS). Dr. Wan is also interested in the function of Wnt/Planar Cell Polarity (PCP) signal involved in a rare bone disease, autosomal-dominant Robinow syndrome (ADRS).

### **Bokai Zhu, PhD**

Dr Zhu's lab discovered a cell-autonomous mammalian 12h-clock that runs independently from the circadian clock to regulate 12h oscillations of gene expression and metabolism. Dr. Zhu's lab is currently investigating the regulation, as well as the physiological/pathological functions, of the 12h-clock, with an emphasis on its roles in maintaining hepatic metabolic homeostasis and preventing aging-associated diseases.

#### ***Professional Affiliations and Society Memberships***

- Member, American Diabetes Association, 2018-present
- Member, Society for Research on Biological Rhythms, 2020

#### ***Editorships***

- Ad hoc Reviewer, *Journal of Molecular Cell Biology*, 2019

#### ***Major Lectureships and Seminars***

- Invited Speaker, DOME Research Seminar Series, University of Pittsburgh, September 2019

#### ***Honors and Awards***

- Recipient, American Diabetes Association Junior Faculty Development Award, January 2018-December 2021

# GRANTS AND CONTRACTS

## AWARDED

July 1, 2019 to June 30, 2020

### PUBLIC HEALTH SERVICE

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Chen, Beibei	Role of F-Box Proteins in Lung Transplantation	NHLBI	\$20,200	\$11,423
Chen, Beibei	Systematic Investigation of Protein Ubiquitination in ARDS	NHLBI	\$560,255	\$316,544
Chen, Beibei	Translational Studies for Identifying and Targeting Novel Pathways in Systemic Sclerosis Pathogenesis (Project 2)	NIAMS	\$51,549	\$29,125
Eisele, Yvonne	Advancing our understanding of oligomer toxicity in age-related amyloid disorders	NIA	\$159,105	\$89,895
Finkel, Toren	Mapping Age-Related Changes in the Lung	NHLBI	\$7,263	\$4,104
Finkel, Toren	The Role of Calcium Entry Through the Mitochondrial Uniporter in Regulating Cardiac Metabolism and Physiology	NHLBI	\$364,583	\$203,590
Finkel, Toren	Vascular Autophagy as a Mediator of Vascular Aging and Homeostasis	NHLBI	\$338,171	\$191,066
Finkel, Toren	Pittsburgh Older Americans Independence Center	NIA	\$2,414	\$1,303
Gurkar, Aditi	Modulators of DNA Damage Associated Nucleo-Mitochondrial Communication in Aging	NIA	\$158,670	\$89,648
Gurkar, Aditi	Modulators of DNA Damage Associated Nucleo-Mitochondrial Communication in Aging (Supplement)	NIA	\$62,267	\$25,399
Li, Gang	fSNP-seq and DCP-MS as a New Approach to Study AD-associated Non-coding Functional SNPs in a Post GWAS Era	NIA	\$174,659	\$91,235
Li, Gang	Identifying and Characterizing the Functional SNPs on RA-Associated loci involved in CD40/NF-kB Signal	NIAMS	\$19,755	\$10,964
Liu, Shihui	Defining cellular receptors for the Bacillus cereus hemolysin BL toxin (HBL) and the development of anti-HBL therapies	NIAID	\$291,151	\$164,500
Liu, Yuan	DCAF7/HDAC4/TFEB Axis in Acute Lung Injury	NHLBI	\$291,992	\$166,090
Liu, Yuan	Role of Fbxo48-mediated AMPK Proteostasis in the Pathogenesis and Treatment of NAFLD	NIDDK	\$57,981	\$32,759
Mora, Ana	Type II Alveolar Redox Control in Fibrogenesis and Resolution	NHLBI	\$220,722	\$124,707
Mora, Ana	Signaling Mechanisms by Which Mitochondria Regulates Fibrosis in the Lung	NHLBI	\$128,030	\$69,136
Mora, Ana	Aging of Mesenchymal Stem Cells Missing Link in IPF	NHLBI	\$17,758	\$9,589
Mora, Ana	Endothelial Reprogramming in Pulmonary Hypertension	NHLBI	\$9,149	\$5,169

## PUBLIC HEALTH SERVICE

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Mora, Ana	F box-Induced Acute Lung Injury and Parkin	NHLBI	\$13,717	\$7,408
Mora, Ana	HIPPO Signaling in Pulmonary Arterial Hypertension	NHLBI	\$2,272	\$1,284
Mora, Ana	Immunoregulatory Mechanisms of IL-33 in Heart Transplantation	NHLBI	\$3,640	\$1,966
Mora, Ana	Immunoregulatory Mechanisms of IL-33 in Heart Transplantation	NHLBI	\$1,803	\$973
Mora, Ana	Mapping Age-Related Changes in the Lung	NHLBI	\$128,526	\$72,617
Mora, Ana	Novel Role of Smooth Muscle B5 Reductase in Sickle Cell Disease	NHLBI	\$12,809	\$7,237
Mora, Ana	Signaling Mechanisms by Which Mitochondria Regulates Fibrosis in the Lung	NHLBI	\$160,413	\$86,623
Mora, Ana	Tead1 and Cardiac Adaptation	NHLBI	\$9,249	\$5,226
Mora, Ana	Tead1 and Cardiac Adaptation	NHLBI	\$5,132	\$2,900
Mora, Ana	The Role of Calcium Entry Through the Mitochondrial Uniporter in Regulating Cardiac Metabolism and Physiology	NHLBI	\$10,927	\$6,174
Mora, Ana	Therapeutic Targeting of Vascular Subphenotypes of Lung Disease	NHLBI	\$42,295	\$23,896
Mora, Ana	TSC2 signaling in Pulmonary Arterial Hypertension	NHLBI	\$5,534	\$3,127
Mora, Ana	Vascular Subphenotypes of Lung Disease (Core B)	NHLBI	\$132,850	\$75,060
Mora, Ana	GATA6 in pulmonary arterial hypertension	NHLBI/ Boston University	\$9,329	\$5,271
Rizzo, Stacey	Improving Preclinical Translation in Alzheimer's Disease Research	NIA	\$49,004	\$0
Rizzo, Stacey	Role of Lifespan Intervention on the Regulation and Progression of Alzheimer's Disease	NIA	\$441,911	\$249,679
Rizzo, Stacey	Open Drug Discovery Center for Alzheimer's Disease	NIA/Emory University	\$77,688	\$43,894
Rizzo, Stacey	Alzheimer's Disease Translational Center for Disease Model Resources	NIA/Indiana University	\$171,465	\$96,878
Rizzo, Stacey	IUSM Alzheimer's Disease Drug Discovery Center (ADDD Center)	NIA/Indiana University	\$36,300	\$20,509
Rizzo, Stacey	The IU/JAX Alzheimer's Disease Precision Models Center - Admin Core	NIA/Indiana University	\$14,717	\$8,315
Rizzo, Stacey	The IU/JAX Alzheimer's Disease Precision Models Center - Disease Modeling Project	NIA/Indiana University	\$9,730	\$5,498
Rizzo, Stacey	The IU/JAX Alzheimer's Disease Precision Models Center, Preclinical Testing Core	NIA/Indiana University	\$166,585	\$94,120
Steinhauser, Matthew	A new modality to image tumor metabolic heterogeneity at subcellular resolution	NCI	\$374,820	\$211,773
Steinhauser, Matthew	Quantification of the decline of heart muscle cell proliferation and its reversal in pediatric patients	NHLBI	\$20,000	\$11,301
Steinhauser, Matthew	Functional evaluation of a new GWAS locus that links visceral adiposity and type 2 diabetes	NIDDK	\$249,315	\$140,863
<b>TOTAL PUBLIC HEALTH SERVICE</b>			<b>\$5,085,706</b>	<b>\$2,818,840</b>

## VETERANS ADMINISTRATION

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Gurkar, Aditi	IPA - Gurkar	VAMC	\$70,627	\$0
<b>TOTAL VETERANS ADMINISTRATION</b>			<b>\$70,627</b>	<b>\$0</b>

## SOCIETY AND FOUNDATIONS

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Finkel, Toren	Identification and Phase I testing of FDA approved compounds for COVID-19	Jewish Health-care Foundation	\$101,205	\$0
Finkel, Toren	Therapeutic Targeting of E3 Ligases in Aging	UPMC Enterprises	\$1,112,694	\$0
Gurkar, Aditi	Examining the spatio temporal role of oxidative telomere damage on healthspan and lifespan of optogenetics	Aging Institute of UPMC	\$33,000	\$0
Liu, Yuan	Regulation of Mitochondrial function in Lung Injury	American Heart Association	\$70,000	\$7,000
Rizzo, Stacey	Characterization of PACS1 mouse models	PACS1 Syndrome Research Foundation	\$22,686	\$0
Zhu, Bokai	Bolstering the hepatic 12h clock to protect against non-alcoholic fatty liver disease	American Diabetes Association	\$125,111	\$12,511
<b>TOTAL SOCIETY AND FOUNDATIONS</b>			<b>\$1,464,696</b>	<b>\$19,511</b>

## INDUSTRY

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Mora, Ana	Senescence and the validation of new therapeutic concepts for lung fibrosis	Boehringer Pharmaceuticals	\$60,447	\$37,170
Mora, Ana	Telomeres, Senescence, and Metabolism in AEC2	MedImmune, Inc.	\$18,582	\$11,428
Mora, Ana	Telomeres, Senescence, and Metabolism in AEC2	MedImmune, Inc.	\$25,397	\$15,619
Mora, Ana	Palbociclib in Su/HY Rats	Pfizer Inc.	\$7,524	\$4,628
Mora, Ana	Palbociclib in Su/HY Rats	Pfizer Inc.	\$10,280	\$6,322
<b>TOTAL INDUSTRY</b>			<b>\$122,230</b>	<b>\$75,167</b>

<b>PUBLIC HEALTH SERVICE</b>	<b>\$5,085,706</b>	<b>\$2,818,840</b>
<b>VETERANS ADMINISTRATION</b>	<b>\$70,627</b>	<b>\$0</b>
<b>SOCIETY AND FOUNDATIONS</b>	<b>\$1,464,696</b>	<b>\$19,511</b>
<b>INDUSTRY</b>	<b>\$122,230</b>	<b>\$75,167</b>
<b>TOTAL</b>	<b>\$6,743,259</b>	<b>\$2,913,517</b>



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## TEACHING ACTIVITIES

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A central part of the Aging Institute's mission is to promote both innovative research in aging and a rich environment for training a new generation of investigators in the aging field. Our faculty are involved in teaching and mentoring students at all levels from high school through adult continuing education.

### High School Students

The **University of Pittsburgh Health Scholars Academy (UPHCSA)** teaches 100 academically talented high school students between the ages of 15-18. Faculty at the Aging Institute are involved in teaching the Geriatric Health option. Many of the students who attend this academy go on to careers in medicine.

### Undergraduate Students, Graduate Students, and Fellows

Faculty at the Aging Institute participate in individualized mentorship of students from all levels providing opportunities for career development including grant and manuscript writing and developing presentation skills. Faculty serve as mentors for numerous undergraduate trainees in their research laboratories, mentors for the Geriatrics T32 program, supervisors for trainees with individual K awards and committee members for numerous thesis and dissertation committees. Researchers **Yvonne Eisele, PhD**, and **Gang Li, PhD**, currently serve as faculty hosts to Shulun Ma and Ting Wu, two medical students from China's prestigious Central South University Xiangya School of Medicine. This is part of the University of Pittsburgh collaboration with CSU to provide two years of intensive biomedical research training to students from Xiangya Medical School, many who have already completed six years of medical school training. Other teaching activities include teaching and lectures for the Department of Medicine Grant Writing Course for Graduate Students, the Geriatric Medicine Fellow Lecture Series, Problem based learning (PBL) for Medical students, the University of Pittsburgh PACCM Bench Research Course, for-credit Undergraduate Research Internships Opportunities (BIOSC1903) and the Foundation of Biology course for incoming graduate students at University of Pittsburgh. Faculty from the Aging Institute also participated in the Vascular Medicine Institute (VMI) annual retreat which exposes new fellows to potential areas of research. Outside of the University of Pittsburgh, **Stacey Rizzo, PhD**, serves as the Course Director for "Principles and Techniques for Improving Preclinical Translation in Alzheimer's Disease" at the Jackson Laboratory, Bar Harbor, ME, supported by a R13 conference grant.

### Osher Lifelong Learning Institute

The Osher Lifelong Learning Institute at Carnegie Mellon University provides courses for those 50 years and older. **Toren Finkel, MD, PhD**, and **Matthew Steinhauser, MD**, served as the Study Leaders for a course titled the "The Biology of Aging." The session provided an overview of the biology of aging, and discussed age-related incidences of major diseases.

## Conferences

Meeting monthly, the **Aging Institute Research Seminar Series** hosts visiting speakers to present on a variety of topics related to research on aging. The conferences include opportunities for informal discussions with the speaker and post docs at the Aging Institute. All postdocs are highly encouraged to attend the conferences to enable informal interaction with faculty members and to become familiarized with the non-scientific skills required to pursue and succeed in an academic career.

During the academic year, the **Research in Progress** presentations are a monthly activity. All graduate students and postdocs are required to attend this meeting and to present their work at least once a year. We scheduled two presentations per session of 20 minutes with 5-10 minutes for questions. This seminar is a more informal venue in which junior investigators present their current research in order to gain scientific feedback as well as to develop their oral presentation skills.

The **Aging Institute Journal Club** is a monthly activity and all postdocs and junior faculty are required to attend and to present at least once a year. The goal of this meeting is to review current publications and to gain the skill of critically reviewing the literature. Participants are encouraged to present innovative, paradigm-shifting, thought-provoking and/or disruptive publications that will be of general interest to a broader audience and are not necessarily work directly related to the presenter.

And, in an effort to encourage crosstalk among basic, translational and clinical scientists, regular meetings occur for the members of the Aging Institute, the Geriatrics Division of the DOM, the Pepper Center and the School of Public Health as part of a **Translational Aging Forum**. These conversations are focused on ways that the Aging Institute's basic science discoveries can help inform clinical studies and how observations in human participants can better guide laboratory research efforts.

## Postdoctoral Fellows and Activities

### Heather Ballance, PhD

*Mentor: Bokai Zhu, PhD*

Dr. Ballance investigates the function and significance of the recently discovered 12-hour molecular clock in physiology and aging.

#### *Publications*

- Pan Y, **Ballance H**, Meng H, Gonzalez N, Kim SM, Abdurehman L, York B, Chen X, Schnytzer Y, Levy O, Dacso CC, McClung CA, O'Malley BW, Liu S, Zhu B. 12-h clock regulation of genetic information flow by XBP1s. *PLoS Biol.* 2020 Jan 14;18(1):e3000580.

### Diana Milena Davidek, MD

*Mentor: Ana L. Mora, MD*

Dr. Davidek is studying how mitochondria dysfunction result in metabolic adaptations that promote senescence and fibrosis in the lung.

### Maria del Jazmin Calyeca Gomez, PhD

*Mentor: Ana L. Mora, MD*

Dr. Calyeca's research focuses on how the expression of Cyb5R3 with advanced age impairs the resilience to disrepair and fibrosis in the lung. These studies will allow us to identify therapeutic targets and to develop novel therapeutic strategies for IPF.

#### *Publications*

- Bueno M, **Calyeca J**, Rojas M, Mora AL. Mitochondria dysfunction and metabolic reprogramming as drivers of idiopathic pulmonary fibrosis. *Redox Biol.* 2020 Jun;33:101509.

### Jiyong Jang, PhD

*Mentor: Toren Finkel, MD, PhD*

Dr. Jang studies mitochondrial calcium biology in cardiac function and role of autophagy in aging-associated vascular diseases.

#### *Publications*

- Liu J, Zuo Z, Sastalla I, Liu C, **Jang JY**, Sekine Y, Li Y, Pirooznia M, Leppla SH, Finkel T, Liu S. Sequential CRISPR-Based Screens Identify LITAF and CDIP1 as the *Bacillus cereus* Hemolysin BL Toxin Host Receptors. *Cell Host Microbe.* 2020 Sep 9;28(3):402-410.e5. Epub 2020 Jun 15.

### Danli Jiang, PhD

*Mentor: Gang Li, PhD*

Dr. Jiang is interested in the application of SNP-seq to identify and validate 11 fSNPs from all the 165 SNPs that are associated with CDKN2A/B locus in LDs based on current GWAS data, using FREP-MS to identify multiple proteins that specifically bind to each of these 11 fSNPs.

#### *Publications*

- Zhao Y, Wu D, **Jiang D**, Zhang X, Wu T, Cui J, Qian M, Zhao J, Oesterreich S, Sun W, Finkel T, Li G. A sequential methodology for the rapid identification and characterization of breast cancer-associated functional SNPs. *Nat Commun.* 2020 Jul 3;11(1):3340.

### Travis Lear, PhD T32 Scholar

*Mentor: Bill Chen, PhD*

Dr. Lear is interested in the mechanisms and biologic consequence of proteolytic control of nutrient

sensing, with focus on the degradation of regulators of the mTORC1 signaling pathway. With the Chen Lab, Dr. Lear is working to characterize the landscape of mTORC1 regulator protein stabilities through cell-based high throughput screening and varying stress conditions (Proteasomal inhibition, nutrient deprivation, etc). Unstable and rapidly degraded regulators are selected as candidates for E3 ligase siRNA screening to understand the mechanism of ubiquitin-proteasome regulation, and the consequence on mTORC1 signaling in the cell.

#### **Publications**

- Liu Y, **Lear TB**, Verma M, Wang KZ, Otero PA, McKelvey AC, Dunn SR, Steer E, Bateman NW, Wu C, Jiang Y, Weathington NM, Rojas M, Chu CT, Chen BB, Mallampalli RK. Chemical inhibition of FBXO7 reduces inflammation and confers neuroprotection by stabilizing the mitochondrial kinase PINK1. *JCI Insight*. 2020 Jun 4;5(11).

### **Xiaoni Li, PhD**

**Mentor: Gang Li, PhD**

Dr. Li researches the molecular mechanisms and novel therapeutic targets of Hutchinson-Gilford progeria syndrome (HGPS), as well as the potential connections between HGPS and normal vascular aging.

### **Takeshi Murai, PhD**

**Mentor: Stacey J. Sukoff Rizzo, PhD**

Dr. Murai's present research focus includes investigating genetic risk and susceptibility for conversion to Alzheimer's disease from normal healthy aging in marmosets. He is also establishing and validating behavioral assays in common marmosets to assess both neurodevelopmental trajectories and aging characteristics including motor activity, grip strength, gustation, and cognitive function.

### **Xiaoyu Zhang, PhD**

**Mentor: Gang Li, PhD**

Dr. Zhang's research focuses on identification and characterization of non-coding functional SNPs and gene regulatory mechanisms on late-onset Alzheimer's disease (LOAD)-associated risk loci using cutting-edge techniques, SNP-seq, Reel-seq, and SDCP-MS

#### **Publications**

- Zhao Y, Wu D, Jiang D, **Zhang X**, Wu T, Cui J, Qian M, Zhao J, Oesterreich S, Sun W, Finkel T, Li G. A sequential methodology for the rapid identification and characterization of breast cancer-associated functional SNPs. *Nat Commun*. 2020 Jul 3;11(1):3340.

### **Meijuan Zou, PhD**

**Mentor: Toren Finkel, MD, PhD**

Dr. Zou's research focuses on functional studies of SNPs-associated with autoimmune diseases.

# ONE-YEAR BIBLIOGRAPHY

July 1, 2019 to June 30, 2020

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