Mission: Through discovery, education and service, the BMS faculty strive to be leaders in their areas of scholarship. Using interdisciplinary approaches, BMS faculty perform hypothesis-driven investigations to reveal mechanisms that underlie biological processes and human disease and collaborate with clinical researchers to facilitate the development of novel diagnostics, therapies and preventative measures. BMS faculty are also engaged in medical and graduate education by developing, delivering and assessing curricula, and conduct educational scholarship.

Rebecca Fisher, PhD, and Frederic Zenhausern, PhD, MBA
Interim Co-Chairs
Basic Medical Sciences

Publications – High profile publications by the BMS faculty in 2020 include the following:


phoenixmed.arizona.edu/bms
Publications Continued:


Mission:
Through discovery, education and service, the BMS faculty strive to be leaders in their areas of scholarship. Using interdisciplinary approaches, BMS faculty perform hypothesis-driven investigations to reveal mechanisms that underlie biological processes and human disease and collaborate with clinical researchers to facilitate the development of novel diagnostics, therapies and preventive measures. BMS faculty are also engaged in medical and graduate education by developing, delivering and assessing curricula, and conduct educational scholarship.

Rebecca Fisher, PhD, and Frederic Zenhausern, PhD, MBA
Interim Co-Chairs
Basic Medical Sciences

Department of Basic Medical Sciences
Highlights 2020

Publications Continued:


- Rausch MP, Meador LR, Metzger TC, Li H, Qiu S, Anderson MS and Hastings KT. GLIT in Thymic Epithelial Cells Facilitates Central CD4 T Cell Tolerance to a Tissue-Restricted, Melanoma-Associated Self Antigen. *Journal of Immunology*, 2020 Jun 1, 204(11):2877-2886. Impact Factor 5.05.

*Featured on the cover of this issue.


phoenixmed.arizona.edu/bms

6-22-2021
Mission:
Through discovery, education and service, the BMS faculty strive to be leaders in their areas of scholarship. Using interdisciplinary approaches, BMS faculty perform hypothesis-driven investigations to reveal mechanisms that underlie biological processes and human disease and collaborate with clinical researchers to facilitate the development of novel diagnostics, therapies and preventive measures. BMS faculty are also engaged in medical and graduate education by developing, delivering and assessing curricula, and conduct educational scholarship.

Rebecca Fisher, PhD, and Frederic Zenhausern, PhD, MBA
Interim Co-Chairs Basic Medical Sciences

Department of Basic Medical Sciences
Highlights 2020

Publications Continued:


phoenixmed.arizona.edu/bms

6-22-2021
Mission:
Through discovery, education and service, the BMS faculty strive to be leaders in their areas of scholarship. Using interdisciplinary approaches, BMS faculty perform hypothesis-driven investigations to reveal mechanisms that underlie biological processes and human disease and collaborate with clinical researchers to facilitate the development of novel diagnostics, therapies and preventive measures. BMS faculty are also engaged in medical and graduate education by developing, delivering and assessing curricula, and conduct educational scholarship.

Rebecca Fisher, PhD, and Frederic Zenhausern, PhD, MBA
Interim Co-Chairs
Basic Medical Sciences

--

Publications Continued:


Grants and Awards:

- Trent Anderson, PhD, Associate Professor, was awarded a $503,046 collaborative grant with Arizona State University from the National Institutes of Health (NIH) for his work entitled “Exploiting Sex-Dependent Brain Injury Response for Nanoparticle Therapeutics.” The study is to further research in public health because it probes differential pathological response to traumatic

*phoenixmed.arizona.edu/bms*

6-22-2021
Grants and Awards Continued:

- **Trent Anderson, PhD**, Associate Professor — with Frank Porreca, PhD, and Edita Navratilova, PhD, at University of Arizona — was awarded a $317,456 DC per year, multiple PI grant from the National Institutes of Health (NIH) for his work entitled “Mechanisms and Therapeutic Strategies for Post-Traumatic Headache.” Their studies are aimed to increase understanding of PTH and transition to PPTH in order to improve therapies for patients.

- **Amelia Gallitano, MD, PhD**, and Kimberly Meyers, an ASU PhD student, received a VRP — P1 — $10,000 award for their work entitled “Elucidating the Neurobiological and Molecular Mechanisms Underlying the Therapeutic Benefit of Electroconvulsive Therapy.”

- **Amelia Gallitano, MD, PhD**, received the Japan Society for the Promotion of Science (JSPS) Fellowship Award to support her upcoming sabbatical; she will be a Visiting Professor in the laboratory of Professor Hiroyuki Okuno, PhD, Department of Biochemistry and Molecular Biology at Kagoshima University Graduate School of Medical and Dental Sciences in Japan.

- **Rayna Gonzales, PhD**, Associate Professor, and Trevor Wendt, a UArizona PhD student, received a VRP — P1A — $10,000 award for their work entitled “S1PR1 Regulation of Brain Endothelial Dysfunction and Barrier Properties Using an Invitro Model of Ischemic Stroke.”

- **Rayna Gonzales, PhD**, Associate Professor, and **Taben Hale, PhD**, Associate Professor, received VA Merit Award with co-investigators/PIs Dr. Migrino and Dr. Lifshitz, for their work entitled “Mechanistic Role of Vascular Dysfunction in TBI-Mediated Cognitive Dysfunction.”

- The laboratory of **Rayna Gonzales, PhD**, received a Sarver Heart Center anonymous donation for $10,500.

- **Kurt Gustin, PhD, and Rita Sattler, PhD**, received a VRP — P2 — $49,640 award for their work entitled “Interplay between C9orf72 ALS and Neutrotropic Viruses: Impact on Viral and ALS Disease Pathogenesis.”

- **Taben Hale, PhD**, Associate Professor, and Alexis Bailey, UArizona medical student, received a VRP — P1b — $5,000, for her work entitled “Impact of Transient ACE Inhibition on TGF Beta Signaling in Response to Angiotensin II.”

phoenixmed.arizona.edu/bms
Grants and Awards Continued:

*Taben Hale, PhD, Associate Professor, was awarded an $8,242,697, U54 grant from the National Institutes of Health (NIH) for her work entitled “Sex Differences in Major Depression: Impact of Prenatal Stress-Immune and Autonomic Dysregulation.” Dr. Hale’s team will perform studies to advance knowledge of the relationships between disorders of the brain and the heart to identify novel treatment strategies to specifically target cardiovascular disease and MDD.*

*She was the co-investigator.*

Alexandra Garvin, PhD — of the Taben Hale, PhD, laboratory — was selected for the postdoctoral position on the Interdisciplinary Training in Cardiovascular Research T32 training grant.

- **Karen Hastings, MD, PhD,** Associate Professor, was awarded $213,000 for a Rapid Response Restricted Funds Proposal, University Arizona Cancer Prevention Clinical Trials Network, from the National Institutes of Health for her work entitled “Biomarker Development for Early Phase Clinical Trials for Melanoma Prevention.” The grant runs December 1, 2020, to May 31, 2022.

- **Karen Hastings, MD, PhD,** Associate Professor, was awarded a $250K Basic Science Award from Harry J. Lloyd Charitable Trust for her work entitled “MHC Class II Presentation in Melanoma: Impact on Immune Recognitions.” The grant runs May 20, 2020, to May 19, 2022.

- **Karen Hastings, MD, PhD,** Associate Professor, was awarded $100K for Basic-Clinical Partnerships to Promote Translational Research from the National Institutes of Health. Her work was entitled, “Immune Mechanisms of a Novel Melanoma Therapy Invented at UA Under.” The grant runs January 1, 2020, to December 31, 2021.

- **Karen Hastings, MD, PhD.** Associate Professor, and team at the University of Nebraska have received approval for continued support of training grant R25 to train Native American students in cancer research. Current students are Kristiann Ferreira in the Hale laboratory and Chelsea Claw in the Kim laboratory.

[Link to Department of Basic Medical Sciences Website: phoenixmed.arizona.edu/bms]
Grants and Awards Continued:

- Anngela Adams, MD, PhD, student in the Hastings laboratory — in her first year of the CTS program — was awarded the Histochemical Society Cornerstone Grant for medical and graduate student trainees. The award provides $2,000 for her project on the association of GILT protein expression in melanoma cells with clinical outcome in metastatic melanoma patients. As a stipulation of this award, she will present her research at a national meeting next year.

- Melissa Herbst-Kralovetz, PhD, Associate Professor, was awarded $50,000 as the Co-PI from the University Arizona Challenge Grant Program, for her work entitled “SARS-CoV-2 Infection, Societal Changes during the SARS-CoV-2 Pandemic and Reproductive Health.” The grant runs January 1, 2021, June 30, 2021.

- Melissa Herbst-Kralovetz, PhD, Associate Professor, was awarded a U54 grant funded by the Native American Cancer Prevention grant. It is sponsored by the NIH National Cancer Institute and is a partnership between UA Arizona Cancer Center and NAU.

- Melissa Herbst-Kralovetz, PhD, Associate Professor, was awarded a $100,000 Flinn Foundation Bridging Award for R01 from Private Foundation Grants, entitled “Longitudinal HPV Infection and Vaginal microbiome.” The grant April 1, 2020, to June 30, 2021.

- Melissa Herbst-Kralovetz, PhD, Associate Professor, was awarded $75,000 as the PI from Phoenix Friends of the University Arizona Cancer Center, for her work entitled "Immune Checkpoint Profiles, Estrobolome and Endometrial Cancer.” The grant runs November 1, 2020, December 21, 2022.

- Melissa Herbst-Kralovetz, PhD, Associate Professor, was awarded $50,000 as the PI from Women Investing in Science and Health, Banner Health Foundation, for her work entitled "Transformative Health Screen and Diagnostic for Women Suffering from Endometriosis." The grant runs January 1, 2021, December 31, 2021.

- Peter Jurutka, PhD, Research Professor, ASU/BMS — along with Dr. Wagner — was awarded a $484,166, three-year R15 from the National Institutes of Health (NIH) for his work entitled “Assessing Novel Rexinoids Developed by Comparative Bioresponse Analysis in an Innovative Mouse Model of Cutaneous T Cell Lymphoma.”

phoenixmed.arizona.edu/bms
Grants and Awards Continued:

- **Peter Jurutka, PhD**, Research Professor, ASU/BMS — along with Drs. Sandrin and Pasternak — was awarded $129,307 from Phoenix Children’s Hospital for his work entitled “Novel Approaches to Assess the Gut Microbiome and Other Biomarkers in Pediatric IBD and Celiac Disease Populations.”

- **Peter Jurutka, PhD**, Research Professor, ASU/BMS, and colleagues were awarded one new US patent for novel drug compounds with the potential to combat cancer and dementia (US #10,787,421), bringing the total number of patents to 15.

- **Jerome Lacombe, PhD**, Assistant Professor, BMS/ANBM, and Dr. Diaz were awarded $250,000 from St. Joseph’s Foundation at Dignity Health, for their work entitled “Investigation of Stereotactic Ablative Radiation Treatment in Combination with Anti-PD1 Immunotherapy for Lung Cancer by Using an Innovative Tumor-on-Chip Technology.” This study will lead to a joint project to investigate the role of SABR radiation regimen in NSCLC tumor control and radiotoxicity development in combination with anti-PD1 immunotherapy.

- **Jerome Lacombe, PhD**, Assistant Professor, BMS/ANBM, was awarded $20,000 for the development of an international program — the Thomas Jefferson Fund between United States and France — for the study of pharmaceutical stability during deep space mission.

- **Jerome Lacombe, PhD**, Assistant Professor, BMS/ANBM, was awarded a grant from Baylor College of Medicine, for his work entitled “Space-based Paper Microfluidic Vertical Flow Assay for Rapid Multiplex Diagnostics (VFD) in COVID-19 Pandemic Response and Recovery.”

- **Jerome Lacombe, PhD**, Assistant Professor, BMS/ANBM, received a Scientific Exchange Grant from the Swiss National Foundation for a research project on the new ASTEROID Organ-on-chip system to study biological effects of FLASH Radiotherapy in partnership with Dr. Vozenin at the University of Lausanne Hospital (CHUV). This is a seed grant pending a larger consortium grant in review.

- **Suwon Kim, PhD**, Associate Professor, was gifted $60,000 from a foundation donor to support her laboratory research program.

[phoenixmed.arizona.edu/bms](phoenixmed.arizona.edu/bms)
Mission:
Through discovery, education and service, the BMS faculty strive to be leaders in their areas of scholarship. Using interdisciplinary approaches, BMS faculty perform hypothesis-driven investigations to reveal mechanisms that underlie biological processes and human disease and collaborate with clinical researchers to facilitate the development of novel diagnostics, therapies and preventive measures. BMS faculty are also engaged in medical and graduate education by developing, delivering and assessing curricula, and conduct educational scholarship.

Grants and Awards Continued:

- Won Hee Lee, PhD, Assistant Professor, was awarded $180,124 as the Co-I from EVALI ADMINISTRATIVE SUPPLEMENT for her work entitled “Cardiac Mitochondria Protects against Diabetic Cardiomyopathy through Mitophagy.” The grant runs July 27, 2020, to June 30, 2021.

- Shenfeng Qiu, PhD, Associate Professor, was awarded $453,470 as the Co-I from the National Institutes of Health for his work entitled “A Novel Cell and Circuit-Specific Role for SIRT1 in Depression.” In addition, he was awarded $421,519 as the Co-I from the National Institutes of Health for his work “Environmental regulation of Cortical Gene Expression and Circuit Function;” as well as $383,750 from the National Institutes of Health for his work “MET Receptor Tyrosine Kinase and the Development of Forebrain Circuits;” and $177,322 as the PI from the National Institutes of Health for his work “Function and Structure Adaptations in Forebrain Development.”

- Anne Titelbaum, PhD, Assistant Professor, was awarded Northern Arizona University’s College of Health and Human Services Faculty Research/Creativity Seed Grant.

- Frederic Zenhausern, PhD, MBA, BMS/ANBM, was awarded an official DOD OTA grant. It’s a three-years product development program for Tier-1 pathogens detection using Vertical Flow Assays. The total budget ceiling of the project is $9.5M. He also received a $59,000 Asset Development Grant from TLA for “Vertical Flow Molecular Assay Apparatus” to develop the VeriFAST Technology licensed to corporate partners and in product development for DOD.

- Drs. Zenhausern, Gu and Lacombe received a NASA Catalyst grant for developing a multiplex Vertical Flow Immunoassay COVID-19 diagnostics. This is a partnership with the University of Nevada Reno (Dr. Aucoin Lab) and the School of Medicine at the University of Geneva (Dr. Cosson Lab).

- Dr. Zenhausern and team received a grant for sample collection device. The project includes saliva-based COVID-19 testing and saliva oncology testing.

phoenixmed.arizona.edu/bms

6-22-2021
Mission:
Through discovery, education and service, the BMS faculty strive to be leaders in their areas of scholarship. Using interdisciplinary approaches, BMS faculty perform hypothesis-driven investigations to reveal mechanisms that underlie biological processes and human disease and collaborate with clinical researchers to facilitate the development of novel diagnostics, therapies and preventive measures. BMS faculty are also engaged in medical and graduate education by developing, delivering and assessing curricula, and conduct educational scholarship.

Department of Basic Medical Sciences
Highlights 2020

Presentations:

- The Department hosted twenty-eight virtual scientific presentations as part of the annual Basic Medical Sciences Seminar Series.

- Taben Hale, PhD, Associate Professor, BMS, participated as and presented at the following:
  -- Guest Editor, Cellular Signalling, Special Issue – Cardiac Fibrosis: Pathobiology and Therapeutic Targets.
  -- International Society of Heart Research Cardiovascular Webinar Series: “Targeting resident cardiac fibroblasts for treatment of hypertensive heart disease.”
  -- Illumina Single-Cell Sequencing Virtual Symposium (Southwest): “Use of Single-Cell RNA Sequencing to Identify Shifts in Resident Cardiac Fibroblast Populations Following Transient Antihypertensive Therapy.”

- Karen Hastings, MD, PhD, Associate Professor, BMS, presented at the following:
  -- December 2020 – American Physician Scientist Association Western Regional Annual Meeting (Virtual): “Understanding How the Immune System Fights Skin Cancer: Role of the MHC class II Antigen Presentation Pathway in Immune Recognition of Melanoma.”

- Melissa Herbst-Kralovetz, PhD, Associate Professor, BMS, presented at the following:
  -- January 2020 – Townhall on Advancing STEM Equity at Minority Serving Institutions at the University of Arizona in Tucson: “Gender Equity in STEM.”
  -- July 2020 – Anaerobe 2020: “Leveraging Human 3-D Models and Omics to Study Host-Vaginal Microbiota Interactions.”

phoenixmed.arizona.edu/bms

6-22-2021
Department of Basic Medical Sciences
Highlights 2020

Melissa Herbst-Kralovetz, PhD, Presentations Continued:

-- October 2020 – University of Southern California, Department of Translational Genomics Virtual Distinguished Lecture Series, Los Angeles, California: "Predicting Features of the Cervical Cancer Microenvironment through Integrated Multi-Omics Analyses."

-- November 2020 – Vincent Center for Reproductive Biology at Massachusetts General Hospital Virtual Seminar Series: "Integrating Multi-Omics Analyses to Predict Features of the Cervical Cancer Microenvironment."

Honors:

- Congratulations to Deveroux Ferguson, PhD, who was promoted to Associate Professor with tenure.

- Rebecca Fisher, PhD, Professor and Co-Chair, was named a Fellow of the American Association for Anatomy and was featured on the AAMC website in honor of Women in Medicine Month.

- Congratulations to Amelia Gallitano, MD, PhD, Professor! She was promoted to full Professor with tenure. She was also recognized as one of Phoenix Business Journal’s Outstanding Women in Business. More than 250 nominations were reviewed and narrowed down to just 25 honorees.

- Evan Garofalo, PhD. Assistant Professor, and her colleagues published a manuscript in PNAS last June and the manuscript was one of six papers from 2019 selected for the Cozzarelli Prize for Outstanding Scientific Quality and Originality. A very big honor!

- Rayna Gonzales, PhD, Associate Professor, received the Excellence in Graduate Student Mentoring Award, from the University Arizona College of Medicine – Phoenix in 2020.

- Amal Altaf — UArizona Associate in Teben Hale's laboratory — received the Barbara A. Horwitz and John M. Horwitz Outstanding Undergraduate Abstract Award and Matt Siegel received a SURF summer fellowship from ASPET.

- Melissa Herbst-Kralovetz, PhD, Associate Professor, was recognized for providing knowledge for Nature Research Precision Oncology’s Behind the Paper blog. Great scientific impact!

phoenixmed.arizona.edu/bms
Mission:
Through discovery, education and service, the BMS faculty strive to be leaders in their areas of scholarship. Using interdisciplinary approaches, BMS faculty perform hypothesis-driven investigations to reveal mechanisms that underlie biological processes and human disease and collaborate with clinical researchers to facilitate the development of novel diagnostics, therapies and preventive measures. BMS faculty are also engaged in medical and graduate education by developing, delivering and assessing curricula, and conduct educational scholarship.

Honors:

- Jerome Lacombe, PhD, Assistant Professor, BMS/ANBM, received the Swiss National Science Foundation Scientific Exchanges Award and was the recipient of Thomas Jefferson Fund to promote France – USA scientific collaboration (French Embassy).

  Chen-wei Liu, of Won Hee Lee’s laboratory, received two-year AHA postdoctoral fellowship for her work entitled “Patient-Specific iPSCs-Derived Vascularized Organoids for Investigating Differential Susceptibility to E-cigarette.”

- Congratulations to Frederic Zenhausern, PhD, MBA, who was highlighted in a recent Health Sciences Connect newsletter as one of the Top-10 health sciences grant winners for fiscal year 2020.

Rebecca Fisher, PhD, and Frederic Zenhausern, PhD, MBA
Interim Co-Chairs
Basic Medical Sciences

phoenixmed.arizona.edu/bms