CURRICULUM VITAE
Paras Kumar Mishra, PhD, FAHA, FCVS

March 2025

I. GENERAL INFORMATIONS

A. CONTACT INFORMATION

Work address: Department of Cellular and Integrative Physiology
University of Nebraska Medical Center, Omaha, Nebraska-68198, USA
Email: paraskumar.mishra@unmc.edu
Phone: 402-559-8524
Fax: 402-559-4438
Website: https://www.unmc.edu/physiology/faculty/mishra.html

ORCID ID: https://orcid.org/0000-0002-7810-9239

B. EDUCATION

2001-06: PhD in Zoology, Banaras Hindu University, India
Thesis: Evolutionary Studies in Drosophila: Interspecific hybridization among four species of the *Drosophila bipectinata* complex
Mentor: B. N. Singh, Ph., DSc
1999-01: Master of Science in Zoology, Banaras Hindu University, India
1995-99: Bachelor of Science (Zoology Honors), Lalit Narayan Mithila University, India

POSTGRADUATE TRAINING

2008-10: Research Associate, Department of Physiology & Biophysics, University of Louisville, KY
2007-08: Postdoctoral Fellow, Department of Biology, Emory University, GA

C. ACADEMIC APPOINTMENTS

2016- present: Associate Professor (Tenured, effective 7/1/2016), Department of Cellular and Integrative Physiology (CIP), University of Nebraska Medical Center (UNMC), NE
2015-18: Associate Professor (Courtesy), Department of of Anaesthesiology, UNMC
2015-16: Associate Professor (Tenure-track), CIP, UNMC
2013-15: Assistant Professor (Tenure-track), CIP, UNMC
2013-15: Assistant Professor (Courtesy), Department of Anesthesiology, UNMC
2010-13: Assistant Professor (Term-track), Department of Physiology and Biophysics, University of Louisville, KY

D. LEADERSHIP EXPERIENCE

SCIENTIFIC SOCIETY

President (2021): Midlands Society of Physiological Sciences, a chapter of American Physiological Society; https://msps-online.org/

DEPARTMENT ADMINISTRATIVE ROLES

Role	Administration	Year
Chair	Faculty Recruitment Committee	April 2021 -October 2023
Director	Equipment and Safety Operations	July 2020 - October 2023
Chair	A Ross McIntyre Cardio-Renal Seminar Review Committee	July 2020 - October 2023
Director	Seminar Series	Jan 2016 - June 2018

SCIENTIFIC SESSION OF CONFERENCE

Role	Scientific session	Year
Chair	Alternative Metabolic Fuels and Mitochondrial Dysfunction in Heart Failure: Bridging Metabolic Insights and Cardiac Health, Symposium, APS Summit	2025
Co-Chair	Unraveling the Spectrum of Cell Death: Pathways, Mechanisms, and Therapeutic Potential, Featured Topic, APS Summit	2025
Co-Chair	Diabetes and COVID-19, 13th World Congress of the International Society for Adaptive Medicine (ISAM), Orlando, USA	2022
Moderator	Gene therapy and genome editing, College of Medicine Retreat, UNMC	2018
Co-Chair	Matrix metalloproteinases in the cardiovascular system, EB meeting	2015
Chair	Autophagy and miRNA in diabetic heart failure, EB meeting	2015
Co-Chair	Dr. Bruce McManus Young Investigator Award, Int. Acad.CV Science	2015
Moderator	Autophagy and cardiovascular disease, AHA Scientific Session	2015
Chair	MicroRNA and stem cell in muscle pathology, Experimental Biology (EB)	2013

STUDY SECTION

Role	Study section	Year
Chair	Two applications in NIH study section F10A-K	July 21, 2021
Chair	AHA Basic Cell Genetics and Epigenetics	Oct 9, 2019
Chair	AHA Basic Cell Genetics and Epigenetics	Oct 21, 2019
Co-chair	AHA Basic Cell Genetics and Epigenetics	Feb 2018
Chair	AHA Basic Cell Genetics and Epigenetics	Oct 2018
Chair	Three applications in NIH SEP ZEG1 CVRS-L	March 2018

THE BOARD OF REAGENTS FUND PANEL

Chair (2023-24): The Louisiana Board of Reagents Support Fund Department Enhancement Biological Sciences Review Panel

TEACHING

Role	Course	Year
Director	Molecular Mechanisms of Cardiovascular Pathophysiology	2022-
Director	Cardiopulmonary Function in Health and Disease	2020-2023
Co-Director	Cardiopulmonary Function in Health and Disease	2017-2019

E. HONORS AND AWARDS

2024: UneMed Innovation Award for invention of novel protein isoform
2021: Received 2020 Best Review Article Award from the *AJP, Heart and Circulatory Physiology*
2017: Fellow of *American Heart Association* (FAHA)
2017: Excellence in Mentoring Award, University of Nebraska Medical Center
2014: Elected, Fellow of *American Physiological Society, Cardiovascular Section* (FCVS)
2014: New Investigator Award, University of Nebraska Medical Center
https://www.unmc.edu/news.cfm?match=16228
2011: Satu Somani Award in Physiology, Association of Scientists of Indian origin in America
2010: Finalist for Harry Goldblatt New Investigator Award, High Blood Pressure Research conference, American Heart Association
https://www.ahajournals.org/doi/full/10.1161/hypertensionaha.111.169516
2010: *Best Poster Award* in 2nd International Conference on H_2S Biology and Medicine
2005: National Level Travel Award from the Department of Science and Technology of India for attending "10th European Society for Evolutionary Biology" international conference, held in Krakow, Poland.
2005: National level Travel Award from the Indian National Science Academy for attending "10th European Society for Evolutionary Biology" international conference, held in Krakow, Poland

II. RESEARCH

Our research has led to key discoveries in diabetic heart failure, elucidating its underlying mechanisms and advancing innovative therapeutic strategies. We were the **first to establish ferroptosis as a critical process in human heart failure**, demonstrating its predominant role over other cell death mechanisms in diabetic heart failure. Ferroptosis, a relatively recent discovery, is an iron-mediated, lipid peroxide-driven form of cell death, with its molecular regulators still emerging. **Our pioneering work identified matrix metalloproteinase-9 (MMP9) as a regulator of ferroptosis** through its interactions with subcellular proteins, opening new avenues for targeted therapy. Myocardial cell death is a precursor to cardiomyopathy, as adult cardiomyocytes have limited regenerative capacity, making their loss irreversible. Apoptosis, a widely studied cell death mechanism, plays a minimal role in human heart failure, highlighting the significance of non-apoptotic cell death pathways. To enhance rigor and reproducibility in the field, we developed **best-practice guidelines for evaluating myocardial cell death** via apoptotic and non-apoptotic mechanisms. This widely cited guideline article, which received the Best Review Article Award, has significantly influenced research in cardiovascular pathology worldwide.

Diabetic heart failure differs from non-diabetic heart failure in several key aspects, including metabolic alterations (increased fatty acid oxidation), steatosis (lipid accumulation in cardiomyocytes), and sex-specific disparities (with females at higher risk than males). Metabolic remodeling in the diabetic heart promotes cardiac steatosis, while mitochondrial dysfunction—a hallmark of diabetic cardiomyopathy—aggravates lipotoxicity, oxidative stress, cell death, and inflammation. These pathological processes contribute to structural remodeling (fibrosis and hypertrophy) and functional impairment, beginning with diastolic dysfunction and progressing to systolic failure. To investigate the molecular mechanisms underlying these changes, we **developed a novel diabetic mouse strain (Akita/miR-133aTg)** and demonstrated the specific role of miR-133a in preventing cardiac steatosis in diabetes. Additionally, our studies in rodent diabetic models revealed that miR-133a mimic treatment improves cardiac function, **establishing miR-133a as a promising therapeutic target** for the prevention, management, and treatment of diabetic cardiomyopathy. Notably, miR-133a expression is upregulated by hydrogen sulfide donors, and **hydrogen sulfide levels are elevated through exercise training**. This **hydrogen sulfide–miR-133a axis** represents a potential mechanism through which exercise enhances cardiac function in diabetes. Furthermore, in MMP9 knockout mice, miR-133a is significantly upregulated in cardiomyocytes, leading to enhanced contractility. We **developed a novel diabetic mouse strain (Akita/MMP9KO)** and demonstrated that MMP9 deficiency improves cardiomyocyte contractility in diabetic hearts. These findings suggest that MMP9 inhibitors may improve cardiac function by increasing miR-133a levels. Collectively, **our research highlights a promising therapeutic strategy** for addressing diabetic cardiomyopathy—an incurable and highly prevalent disease.

We have utilized various models of diabetes to investigate its impact on the heart. For type 1 diabetes (T1DM), we employ both an acute model (streptozotocin-induced) and a chronic model (Insulin 2 heterozygous mutant Akita mice). For type 2 diabetes (T2DM), we use a genetic model (leptin receptor mutant db/db) and an obesity-induced model (high-fat diet combined with low-dose streptozotocin). Each diabetic model has its own strengths and limitations. I have **contributed to the development of guidelines on models of diabetic heart disease**, providing a comprehensive evaluation of their advantages and constraints.

For in vitro studies, we use various cardiomyocyte cell lines to investigate molecular mechanisms. These include HL-1 (murine atrial cardiomyocytes), H9c2 (rat embryonic ventricular cardiomyocytes), and AC16 (human ventricular cardiomyocytes). However, gene knockdown and overexpression in these cells pose technical challenges due to low transfection efficiency. To address this, we have **developed an optimized transfection method for HL-1 and H9c2 cells,** refining the selection of transfection agents, optimizing dose combinations of transfection agents and DNA, and minimizing toxicity. This advancement significantly enhances molecular studies in cardiac research.

Our research has redefined molecular mechanisms and therapeutic strategies in diabetes-induced heart failure. We identified ferroptosis as a key cell death pathway, uncovered MMP9's role, and established MMP9 inhibition and miR-133a restoration as therapeutic targets. Additionally, we demonstrated the cardioprotective effects of exercise via the hydrogen sulfide–miR-133a axis. By developing novel mouse models, optimizing cardiomyocyte transfection, and publishing guidelines on myocardial cell death and diabetic models, we pave the way for innovative interventions to improve cardiac health in diabetes.

A. RESEARCH IMPACT

Google scholar profile: https://scholar.google.com/citations?user=c40osEkAAAAJ&hl=en
h-index: 38 (total citations 14914), i10-index: 64

NIH iCITE (Paras Kumar Mishra): https://icite.od.nih.gov/results?search_id=3h6ohn29qmrfcp80

B. PUBLICATIONS

Complete List of Publications:

https://www.ncbi.nlm.nih.gov/sites/myncbi/1BUMsLa0MVe5j/bibliography/44080859/public/?sortby=pubDate&sdirection=descending

RESEARCH ARTICLE (* corresponding author)

1. Gawargi FI, **Mishra PK*.** Regulation of cardiac ferroptosis in diabetic human heart failure: uncovering molecular pathways and key targets. *Cell Death Discov*. 2024. PMID: 38824159.
2. Gawargi FI, **Mishra PK*.** MMP9 drives ferroptosis by regulating GPX4 and iron signaling. *iScience.* 2024. PMID: 39252956.
3. Gawargi FI, **Mishra PK*.** Deciphering MMP9's dual role in regulating SOD3 via protein-protein interaction. *Canadian Journal of Physiology and Pharmacology*. 2024. PMID: 37992301.
4. Ai W, Casey CA, **Mishra PK**, Alnouti Y, Daria S, Saraswathi V. Blockade of thromboxane A2 signaling attenuates ethanol-induced myocardial inflammatory response in mice. *Alcohol Clin Exp Res.* 2024. PMID: 39030742.
5. Gawargi FI, **Mishra PK*.** Tailoring transfection for cardiomyocyte cell lines: balancing efficiency and toxicity in lipid versus polymer-based transfection methods in H9c2 and HL-1 cells. *Am J Physiol- Heart Circ Physiol.* 326(6):H1406-H1419. 2024. PMID: 38607343.

Spotlight Cover for *American Journal of Physiology – Heart and Circulatory Physiology*

We introduce meticulously crafted protocols to enhance the culture and transfection of H9c2 and HL-1 cells, emphasizing the reduction of cytotoxic effects while improving transfection efficiency. Through the examination of polymer-based and lipid-based transfection methods, we offer a comparative analysis that underscores the heightened efficiency and reduced toxicity of these approaches. Our research provides an extensive array of step-by-step procedures designed to foster robust cell cultures and outlines troubleshooting practices to rectify issues of low transfection rates. We discuss the merits and drawbacks of both transfection techniques, equipping researchers with the knowledge to choose the most fitting method for their experimental goals. By offering a definitive guide to these cell lines' culturing and transfection, our work seeks to set a new standard in procedural consistency, ensuring that the cardiovascular research community can achieve more dependable and reproducible results, thereby pushing the boundaries of current methodologies toward impactful clinical applications.

6. Yadav SK, Gawargi FI, Hasan MH, Tandon R, Upton JW, **Mishra PK*.** Differential effects of CMV infection on the viability of cardiac cells. *Cell Death Discovery*. 9(1):111, 2023. PMID: 37012234.
7. Park SY, Pekas E, Anderson C, Kambis TN, **Mishra PK,** Schieber MN, Wooden TK, Thompson J, Kim KS, Pipinos I I. Impaired microcirculatory function, mitochondrial respiration, and oxygen utilization in skeletal muscle of claudicating patients with peripheral artery disease. *Am J Physiology - Heart Circ Physiol.* 322 (5): H867-H879, 2022. PMID: 35333113.
8. Kambis TN, Shahshahan HR, **Mishra PK*.** Metabolites and genes behind cardiac metabolic remodeling in mice with type 1 diabetes mellitus. *International Journal of Molecular Science*. 23 (3), 1392, 2022. PMID: 35163316.
9. Yadav SK, **Mishra PK*.** Intracellular matrix metalloproteinase-9 mediates epigenetic modifications and autophagy to regulate differentiation in human cardiac stem cells. *Stem Cells*. 39; 497-506, 2021. PMID: 33438302. The Best Papers from 2022 STEM CELLS® Young Investigators.
10. Park SY, Pekas E, Headid RJ, Son WM, Wooden TK, Song J, Layec G, Yadav SK, **Mishra PK,** Pipinos I I. Acute mitochondrial antioxidant intake improves endothelial function, antioxidant enzyme activity, and exercise tolerance in peripheral artery disease patients. *Heart, and Circulatory Physiology.* 319(2): H456-H467, 2020. PMID: 32706261.
11. Yadav SK, Kambis TN, Kar S, Park SY, **Mishra PK*.** MMP9 mediates acute hyperglycemia-induced human cardiac stem cell death by upregulating apoptosis and pyroptosis in vitro. *Cell Death and Disease*. 13; 11(3):186, 2020. PMID: 32170070.
12. Kar. S, Shahshahan HR, Hackfort BT, Yadav SK, Yadav R, Kambis TN, Lefer DJ, **Mishra PK*.** Exercise training promotes cardiac hydrogen sulfide biosynthesis and mitigates pyroptosis to prevent high-fat diet-induced diabetic cardiomyopathy. *Antioxidants,* 11; 8 (12), pii: E638, 2019. PMID: 30925069.
13. Kar. S, Shahshahan HR, Kambis TN, Yadav SK, Zhen Li, Lefer DJ, **Mishra PK*.** Hydrogen sulfide ameliorates homocysteine-induced cardiac remodeling and dysfunction. *Frontiers in Integrative Physiology*, 10:598, 2019. PMID: 31178749.
14. Kambis TN, Shahshahan HR, Kar S, Yadav SK, **Mishra PK*.** Transgenic expression of miR-133a in the diabetic Akita heart prevents cardiac remodeling and cardiomyopathy. *Frontiers in Cardiovascular Medicine,* 6:45, 2019. PMID: 31069235.
15. Yadav SK and **Mishra PK***. Isolation, characterization, and differentiation of cardiac stem cells from the adult mouse heart. *J. Vis. Exp*. (143), e58448, 2019. PMID: 30663680.
16. Nandi SS, Shahshahan HR, Shang Q, Kutty S, Boska M, **Mishra PK** *. MiR-133a mimic alleviates T1DM-induced systolic dysfunction in Akita: A MRI-based study. *Frontiers in Physiology*, 9:1275, 2018. PMID: 30364155.
17. Krishnan B, Massilamany C, Basvalingappa RK, Gangaplara A, Rajasekaran RA, Afzal MZ, Sharghi VK, Zhou Y, Eiethoven J J, Nandi SS, **Mishra PK,** Sobel RA, Strande JL, Steffen D, Reddy J. Epitope mapping of SERCA2a identifies an antigenic determinant that induces mainly atrial myocarditis in A/J mice. *Journal of Immunology*. 200 (2): 523-537, 2018. PMID: 29229678.
18. Kesherwani V, Shahshahan HR, **Mishra PK** *. Cardiac transcriptome profiling of diabetic Akita mice using microarray and next generation sequencing. *PLOS ONE.* 12 (8): e0182828, 2017. PMID: 28837672.
19. Nandi SS*, **Mishra PK***. H_2S and homocysteine control a novel feedback regulation of cystathionine beta synthase and cystathionine gamma lyase in cardiomyocytes. *Scientific Reports.* 7: 3639, 2017. PMID: 28623294.
20. Sharma NM, Nandi SS, Zheng H, **Mishra PK**, Patel KS. A novel role for miR-133a in centrally mediated activation of the renin-angiotensin system in congestive heart failure. *American Journal of Physiology - Heart and Circulatory Physiology.* 312 (5): H968-979, 2017. PMID: 28283551. Highlighted as an APS*select* article, a platform for the best articles in physiological research. Link: http://apsselect.physiology.org/
21. Nandi SS, Zheng H, Sharma NS, Shahshahan HR, Patel KP, **Mishra PK***. Lack of miR-133a decreases contractility in diabetic hearts: a role for novel crosstalk between tyrosine aminotransferase and tyrosine hydroxylase. *Diabetes* 65 (10): 3075-90, 2016. PMID: 27411382.
22. Prathipati P, Metreveli N, Nandi SS, Tyagi SC, **Mishra PK***. Ablation of matrix metalloproteinase-9 prevents cardiomyocytes contractile dysfunction in diabetics. *Frontiers in Physiology* 7:93, 2016. PMID: 27014091.

23. Nandi SS, Duryee MJ, Thiele GM, Anderson DR, **Mishra PK***. Induction of autophagy markers is associated with attenuation of miR-133a in diabetic heart failure patients undergoing mechanical unloading. *American Journal of Translational Research* 7(4) 683-696, 2015. PMID: 26064437.
24. Kesherwani V, Chavali V, Hackfort BT, Tyagi SC, **Mishra PK***. Exercise ameliorates high fat diet induced cardiac dysfunction by increasing interleukin 10. *Frontiers in Physiology* 6: 124, 2015. PMID: 25954207.
25. Kesherwani V, Nandi SS, Sharawat SK, Shahshahan HR, **Mishra PK***. Hydrogen sulfide mitigates homocysteine mediated pathological remodeling by inducing miR-133a in cardiomyocytes. *Molecular and Cellular Biochemistry* 404: 241-250, 2015. PMID: 25763715.
26. Zheng H, Liu X, Li Y, **Mishra PK**, Patel KP. Attenuated dopaminergic tone in the paraventricular nucleus contributing to sympatho-excitation in rats with type2 diabetes. *American Journal of Physiology, Regulatory, Integrative, and Comparative Physiology* 306: R138-148, 2014. PMID: 24305061.
27. Chavali V, Tyagi SC, **Mishra PK** *. Differential expression of dicer, miRNA, and inflammatory markers in diabetic Ins2+/- Akita hearts. *Cell Biochemistry and Biophysics* 68: 25-35, 2014.
28. Chavali V, Tyagi SC, **Mishra PK***. MicroRNA-133a regulates DNA methylation in diabetic cardiomyocytes. *Biochemical and Biophysical Research Communication* 425:668-672, 2012.
29. ***Mishra PK**, Chavali V, Metreveli N, Tyagi SC. Ablation of MMP9 induces survival and differentiation of cardiac stem cell into cardiomyocytes in the diabetic heart, a role of extracellular matrix. *Canadian Journal of Physiology and Pharmacology* 90: 353-360, 2012.
30. Sen U, Sathur PB, Kundu S, Givvimani S, Coley D, **Mishra PK**, Qipshidze N, Tyagi N, Metreveli N, Tyagi SC. Increased endogenous H_2S generation by CBS, CSE, and 3MST gene therapy improves ex vivo renovascular relaxation in hyperhomocysteinemia. *American Journal of Physiology, Cell Physiology* 303: C41-51, 2012.
31. ***Mishra PK**, Awe O, Metreveli N, Qipshidze N, Joshua IG, Tyagi SC. Exercise mitigates the homocysteine- beta2 adrenergic receptor interactions to ameliorate contractile dysfunction in diabetes. *International Journal of Physiology, Pathophysiology and Pharmacology* 3:97-106, 2011.
32. Basu P, Qipshidze N, Sen U, Givvimani S, Munjal C, **Mishra PK,** Tyagi SC. Chronic hyperhomocysteinemia causes vascular remodeling by instigating vein phenotype in artery. *Archives of Physiology and Biochemistry* 117: 270-282, 2011.
33. Givvimani S, Qipshidze N, Tyagi N, **Mishra PK**, Sen U, Tyagi SC. Synergism between arrhythmia and hyperhomocysteinemia in structural heart disease. *International Journal of Physiology, Pathophysiology and Pharmacology* 3: 107-119, 2011.
34. ***Mishra PK**, Givvimani S, Metreveli N, Tyagi SC. Attenuation of beta2-adrenergic receptors and homocysteine metabolic enzymes cause diabetic cardiomyopathy. *Biochemical and Biophysical Research Communication* 15: 175-181, 2010.
35. Qipshidze N, Metreveli N, **Mishra PK**, Lominadze D, Tyagi SC. Hydrogen sulfide mitigates cardiac remodeling during myocardial infarction via improvement of angiogenesis. *International Journal of Biology* 8: 430-441, 2010.
36. **Mishra PK**, Metreveli N, Tyagi SC. MMP9 gene ablation and TIMP4 mitigates PAR1 mediated cardiomyocytes dysfunction: a plausible role of dicer and miRNA. *Cell Biochemistry and Biophysics* 57: 67-76, 2010.
37. Givvimani S, Tyagi N, Sen U, **Mishra PK**, Qipshidze N, Munjal C, Vacek JC, Abe OA, Tyagi SC. MMP2/TIMP2/TIMP4 Versus MMP9/TIMP3 in transition from compensatory hypertrophy and angiogenesis to decompensatory heart failure. *Archives of Physiology and Biochemistry* 116: 63-72, 2010.
38. **Mishra PK**, Tyagi N, Sen U, Givvimani S, Tyagi SC. H_2S ameliorates oxidative and proteolytic stresses and protects the heart against adverse remodeling in chronic heart failure. *American Journal of Physiology, Heart, and Circulatory Physiology* 298: H451-456, 2010.
39. Moshal KS, Kumar M, Tyagi N, **Mishra PK**, Metreveli N, Rodriguez WE, Tyagi SC. Restoration of contractility in hyperhomocysteinemia by cardiac–specific deletion of NMDA-R1. *American Journal of Physiology, Heart and Circulatory Physiology* 296: H887-892, 2009.
40. Kundu S, Kumar M, Sen U, **Mishra PK**, Tyagi N, Metreveli N, Lominadze D, Rodriguez W, Tyagi SC. Nitrotyrosylation, remodeling and endothelial myocyte uncoupling in iNOS, cystathionine beta synthase (CBS) knockouts and iNOS/CSB double knockout mice. *Journal of Cell Biochemistry* 106: 119-126, 2009.

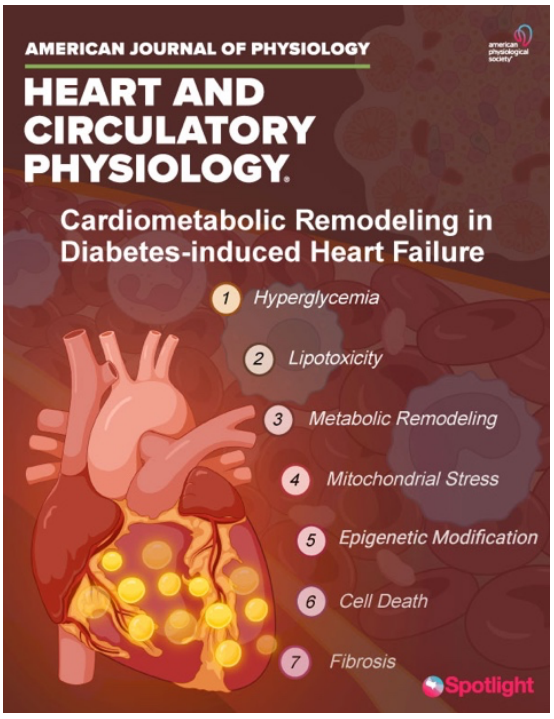
41. Tyagi N, **Mishra PK**, Tyagi SC, Homocysteine, hydrogen sulfide, and NMDA receptor in heart failure. *Indian Journal of Biochemistry and Biophysics* 46: 441-446, 2009.
42. **Mishra PK**, Tyagi N, Kundu S, Tyagi SC. MicroRNAs are involved in homocysteine induced cardiac remodeling. *Cell Biochemistry and Biophysics* 55: 153-162, 2009.
43. Kumar M, Tyagi N, Moshal KS, Sen U, Kundu S, **Mishra PK**, Givvimani S, Tyagi SC. Homocysteine decreases blood flow to the brain due to vascular resistance in carotid artery. *Neurochemical International* 53:214-219, 2008.
44. **Mishra PK**, Singh BN. Assessing the putative roles of X-autosome and X-Y interactions in hybrid male sterility of the Drosophila bipectinata species complex. *Genome* 50: 653-659, 2007.
45. **Mishra PK**, Singh BN. Drosophila bipectinata species complex: study of phylogenetic relationship among four members through the analyses of morphology of testes and seminal vesicles. *Journal of Zoological Systematics and Evolutionary Research* 44: 175-179, 2006.
46. **Mishra PK**, Singh BN. Unique phenotypes, and variation in the sex comb patterns and their evolutionary implications in the Drosophila bipectinata species complex (Diptera: Drosophilidae). *European Journal of Entomology* 103: 805-815, 2006.
47. **Mishra PK**, Singh BN. Genetic interactions underlying hybrid male sterility in the Drosophila bipectinata species complex. *Genes and Genetic Systems* 81: 193-200, 2006.
48. **Mishra PK**, Singh BN. Genetic basis of hybrid male sterility among three closely related species of Drosophila. *Indian Journal of Experimental Biology* 43:455-461, 2005.

REVIEW ARTICLE (* corresponding author)

1. Sharma G, Chaurasia S S, Carlson M A, **Mishra PK***. Recent advances associated with cardiometabolic remodeling in diabetes-induced heart failure. *Am J Physiol Heart Circ Physiol*.327(6):H1327-H1342. 2024. PMID: 39453429.

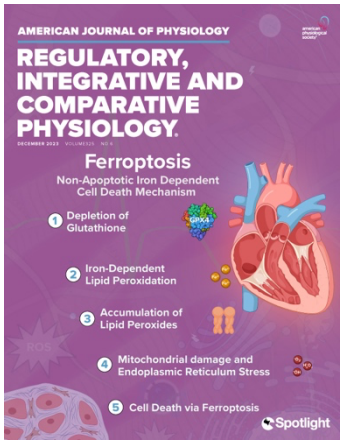
   Spotlight Cover for *American Journal of Physiology – Heart and Circulatory Physiology.*

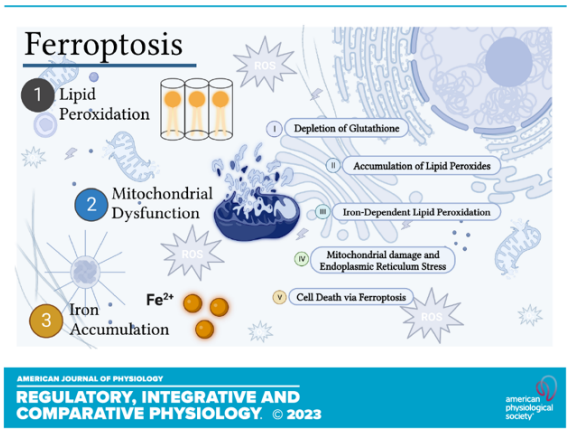
   Decoding cardiometabolic remodeling in diabetes-induced heart failure: novel mechanistic insights, innovative techniques, and emerging therapeutic strategies. Diabetes-induced heart failure (DHF) presents unique metabolic challenges due to altered cardiac substrate metabolism, including increased fatty acid oxidation and impaired glucose utilization. These changes drive lipotoxicity and metabolic remodeling, leading to mitochondrial dysfunction and energy deficits, which worsen heart failure. Emerging mechanisms in diabetic heart remodeling include autophagy dysregulation, epigenetic changes, polyamine imbalance, and disrupted branched-chain amino acid metabolism, providing opportunities for targeted therapies aimed at restoring metabolic balance. Advanced techniques reveal novel strategies, such as adjusting fatty acid metabolism and optimizing ketone body use, offering hope for better cardiac outcomes. This review highlights the latest research, methodologies, and therapeutic approaches to address metabolic disturbances in DHF.

   https://journals.physiology.org/doi/abs/10.1152/ajpheart.00539.2024

2. Gawargi FI, **Mishra PK*.** Ironing out the details: Ferroptosis and its relevance to diabetic cardiomyopathy. *American Journal of Physiology – Regulatory, Integrative and Comparative Physiology.* 325(6): R665-681, 2023.

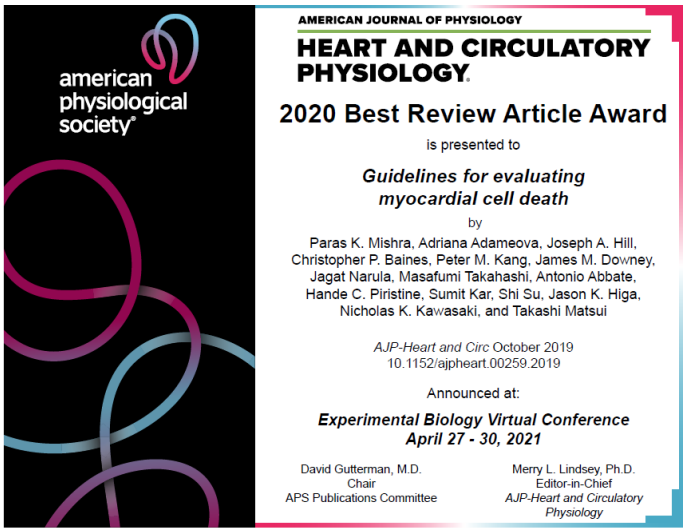




Spotlight Cover for *American Journal of Physiology – Regulatory, Integrative and Comparative Physiology.* Mechanisms of myocardial ferroptosis. Ferroptosis is a non-apoptotic, regulated form of cell death mechanism driven by iron-dependent lipid peroxidation and progresses through a series of distinct events. It begins with the depletion of glutathione, which disrupts the activity of glutathione peroxidase-4 (GPX4), an enzyme that reduces lipid peroxide into alcohol (1). Reduced GPX4 activity is a key marker of myocardial ferroptosis. Downregulation of GPX4 sets the stage for iron-dependent lipid peroxidation (2). This results in accumulation of lipid peroxides (3), which triggers a sequence of events, including mitochondrial damage and endoplasmic reticulum stress (4). Ultimately, these events lead to cell death via ferroptosis (5), which is characterized by the disruption of the cell membrane and release of cellular contents.

https://journals.physiology.org/doi/abs/10.1152/ajpregu.00117.2023 [journals.physiology.org]

3. Heather LC, Hafstad AD, Halade GV, Harmancey R, Mellor KM, **Mishra PK**, Mulvihill EE, Nabben M, Nakamura M, Rider OJ, Ruiz M, Wende AR, Ussher JR. Guidelines on models of diabetic heart disease. *American Journal of Physiology - Heart, and Circulatory Physiology*, 323 (1): H176-H200, 2022. https://pubmed.ncbi.nlm.nih.gov/35657616/
4. Agic MB, Chalise U, Daseke MJ, Konfrst SR, Salomon JD, **Mishra PK,** Lindsey ML. Infarct in the heart: what's MMP-9 got to do with it? *Biomolecules*. 11: 491, 2021.
5. Klionsky DJ, ----**Mishra PK**--- et al. Guidelines for the use and interpretation of assays for monitoring autophagy (4th edition). *Autophagy*, 17 (1): 1-382, 2021. PMID: 33634751.
6. **Mishra PK***, Tandon R, Byrareddy SN. Diabetes and COVID-19 risk: an miRNA perspective. *American Journal of Physiology - Heart and Circulatory Physiology,* 319 (3): H604-H609, 2020. PMID: 32762561. https://pubmed.ncbi.nlm.nih.gov/32762561/
7. **Mishra PK***, Adameová A, Hill JA, Baines CP, Kang PM, Downey JM, Narula J, Takahashi M, Abbate A, Piristine HC, Su S, Higa JK, Kawasaki NK, Matsui T. Guidelines for evaluating myocardial cell death. *American Journal of Physiology, Heart and Circulatory Physiology,* 317 (5): H891-922, 2019.



Winner of the *AJP- Heart and Circulatory Physiology* Best Review Article Award

Cell death is a fundamental process in cardiac pathologies. Recent studies have revealed multiple forms of cell death, and several of them have been demonstrated to underlie adverse cardiac remodeling and heart failure. With the expansion in the area of myocardial cell death and increasing concerns over rigor and reproducibility, it is important and timely to set a

guideline for the best practices of evaluating myocardial cell death. There are six major forms of regulated cell death observed in cardiac pathologies, namely apoptosis, necroptosis, mitochondrial-mediated necrosis, pyroptosis, ferroptosis, and autophagic cell death. In this article, we describe the best methods to identify, measure, and evaluate these modes of myocardial cell death. In addition, we discuss the limitations of currently practiced myocardial cell death mechanisms. https://journals.physiology.org/doi/full/10.1152/ajpheart.00259.2019

8. Kar S, Kambis TN, **Mishra PK*.** Hydrogen sulfide-mediated cell death signaling in diabetic cardiomyopathy. *American Journal of Physiology - Heart and Circulatory Physiology.* 316:H1237-H1252, 2019.
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INVITED REVIEW ARTICLE

21. Kambis TN, Tofilau HMN, Gawargi FI, Chandra S, **Mishra PK***. Regulating polyamine metabolism by miRNAs in diabetic cardiomyopathy. *Current Diabetes Reports*. 21 (12):52, 2021. PMID: 34902085.

EDITORIAL/PERSPECTIVE (* corresponding author)

1. Martelli F, **Mishra PK**, Caporali A. Editorial: Nucleic acid-based therapies for cardiovascular diseases. *Front Cardiovasc. Med.* 11: 1392073, 2024. PMID: 38586169.
2. Chen Y, Zhao Y, **Mishra PK**. Autophagy-mediated cell survival and death in disease progression and treatment. *Front Cell Dev. Biol.* 10:916347, 2022.
3. **Mishra PK**. Why the diabetic heart is energy inefficient: ketogenesis and ketolysis perspective. *American Journal of Physiology, Heart, and Circulatory Physiology*. 2021. PMID: 34533402. https://journals.physiology.org/doi/full/10.1152/ajpheart.00260.2021
4. **Mishra PK*** and Nemer G. The non-coding genome and cardiovascular disease. *Frontiers in Cardiovascular Medicine*. 6:98, 2019. PMID: 31380396.
5. Das A, Reis F, **Mishra PK**. mTOR signaling in Cardiometabolic disease, cancer, and Aging 2018. *Oxidative Medicine and Cellular Longevity*, Feb 4; 9692528, 2019. PMID: 30863483.

6. **Mishra PK**. Is miR-133a a promising therapeutic target for heart failure? *Journal of Diabetes and Metabolism* 5: 8: e118, 2014.

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1. **Mishra PK***. Cardiac regenerative therapy in diabetes: challenges and potential therapeutics. In Haider KH (Editor): Stem Cells: Latest Advances. Springer, 2021. ISBN 978-3-030-77051-8.
2. Tyler N. Kambis, **Mishra PK***. Genome editing and diabetic cardiomyopathy. In Junjie Xiao (Editor): Genome editing in cardiovascular and metabolic diseases. Springer. Adv Exp Med Biol. 2023; 1396: 103-114. PMID 36454462.
3. Shahshahan HR, Kambis TN, Kar S, **Mishra PK*.** Generating Ins2+/-/miR-133aTg mice to model miRNA-driven cardioprotection of diabetic hearts in humans. In Singh SR (Editor): Mouse Genetics: Methods and Protocols. Second Edition. Springer. 2224:113-121, 2021. PMID: 33606210
4. Yadav SK, Kambis TN, **Mishra PK*.** Regulating inflammatory cytokines in diabetic hearts. In Chakraborti S, Dhalla NS, Ganguli NK and Dikshit M (Editors): Oxidative Stress in Heart Diseases. Springer, 2019.
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8. **Mishra PK*,** Kuypers NJ, Singh SR, Diaz N, Chavali V, Tyagi SC. Cardiac stem cell niche, MMP9, and culture and differentiation of embryonic stem cells. In Kursad T (Ed): Stem cells and niche. Springer, 1035: 153-163, 2013. PMID: 23959989.

OTHER BOOK CHAPTER

9. **Mishra PK*,** Tyagi SC. MicroRNOmics of diabetic cardiomyopathy. In Turan B and Dhalla NS (Eds): Diabetic cardiomyopathy, Springer 9: 179-188, 2014.
10. **Mishra PK*,** Singh SR, Sharma R, Tyagi SC. Stem cell for myocardial regeneration. In Singh SR et al (Eds); Stem Cells: organogenesis and cancer. Transword Research Network, 119-126, 2010.
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1. Singh SR, **Mishra PK**, Hou SX. Editors, Stem Cells: Organogenesis and Cancer, Transword Research Network, ISBN: 978-81-7895-487-5; 2010.

PUBLISHED ABSTRACTS AND CONFERENCE PROCEEDINGS

1. Kambis TN, Kar S, **Mishra PK** (2022). miR-133a mitigates ferroptosis by attenuating fatty acid metabolism in the diabetic heart. *The FASEB Journal,* 2022. Vol 36, Issue Suppl_1. https://faseb.onlinelibrary.wiley.com/doi/10.1096/fasebj.2022.36.S1.R5755
2. Shahshahan HR, **Mishra PK**. Cardiomyocyte-specific transgenic MMP9 overexpression induces cardiac remodeling. *The FASEB Journal,* 2021. Vol 35, Issue Suppl_1. DOI: 10.1096/fasebj.2021.35. S1.04281.
3. Kambis TN, **Mishra PK**. Diabetes mellitus-induced metabolic remodeling is alleviated by transgenic overexpression of miR-133a in the heart. *Circulation Research,* 2020. Vol 127, Issue Suppl_1. DOI: 10.1161/res.127.suppl_1.501.
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5. Kar S, Yadav SK, Goyal R, Lefer DJ, **Mishra PK**. Hydrogen sulfide protects the heart against homocysteine-induced remodeling by regulating autophagy and pyroptosis. *Circulation Research,* 2019. Vol 125, Issue Suppl_1. DOI: 10.1161/res.125.suppl_1.433.
6. Kambis TN, Yadav SK, **Mishra PK**. Cardiac-specific overexpression of miR-133a decreases pyroptosis in $Ins2^{+/-}$ T1DM mice heart. *FASEB J,* 2018; 32, 838.12.
7. Yadav SK, **Mishra PK**. Ablation of MMP9 prevents cardiac pyroptosis of $Ins2^{+/-}$ T1DM mice heart. *FASEB J*, 2018; 32, 838.5.
8. Nandi SS, **Mishra PK**. Cardiac-specific overexpression of miR-133a in the diabetic heart mitigates mitochondrial abnormality by targeting TIM17a. *FASEB J*, 2018; 32, 752.5.
9. Yadav SK, **Mishra PK**. Ablation of MMP9 mitigates high glucose-induced cardiac stem cell death. *Circulation*, 2017, 136: A20116.
10. Nandi SS, **Mishra PK**. Hydrogen sulfide controls CBS-CTH feedback regulation by inducing miR-133a and suppressing SP1 in a dose dependent manner in cardiomyocytes. *FASEB J,* 2017; 31, 1079.7.
11. Nandi SS, **Mishra PK**. Ablation of MMP9 upregulates autophagic flux in the diabetic heart. *FASEB J,* 2017; 31, 1013.6.
12. Prathipati P, Hackfort BT, Nandi SS, Shahshahan HR, **Mishra PK**. Ablation of MMP9 alleviates mitophagy and mitigates cardiac dysfunction in diabetics. *Current Research Cardiology*, 2:144, 2015.
13. Hackfort BT, Prathipati P, **Mishra PK**. Role of hydrogen sulfide in the regulation of DNA methyl transferases in cardiomyocytes. *Current Research Cardiology*, 2:140, 2015.
14. Sharma NM, Nandi SS, Liu X, Zheng H, **Mishra PK**, Patel KP. Upregulation of angiotensinogen in the paraventricular nucleus of the hypothalamus during chronic heart failure: Role of miR-133a. *Current Research Cardiology*, 2:122, 2015.
15. Nandi SS, **Mishra PK**. MiR-133a regulates cardiac autophagy in diabetics. *Current Research Cardiology*, 2:121, 2015.
16. **Mishra PK**. Novel cardioprotective role of miR-133a. Current Research Cardiology, 2:125, 2015.
17. Nandi SS, **Mishra PK**. MiR-133a mitigates mitophagy in Ins2+/- diabetic heart. *FASEB J*, 29: 1040.1, 2015.
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SELECTED POSTER/ORAL PRESENTATION

1. Gawargi FI, **Mishra PK** (2024). A novel target for attenuating T1DM-induced myocardial ferroptosis. American Physiological Society Summit, April 4-7, Long Beach, California. (Received APS Research Recognition Award).
2. Gawargi FI, **Mishra PK** (2023). Molecular regulation of ferroptosis in the T1DM heart. American Heart Association Basic Cardiovascular Science conference, Boston, July 31-August 3. Travel Award from the University of Nebraska Medical Center.
3. Li S, Schieber M, Shields C, Brunette K, Zhu Z, Hakim A, Kim J, **Mishra PK**, Casale G, Pipinos II (2023). Ischemic myopathy in the leg muscles of patients with peripheral artery disease: autophagy fails to respond to the increased damage. American Association of Neuropathologists Annual meeting, Monterey, CA, June 8-11.
4. Gowrikumar S, **Mishra PK**, Dhawan P (2023). MMP9KO decelerates claudin-1-mediated colitis and impaired recovery through attenuating notch signaling cascade. Control ID 3866004). Digestive Disease Week. Chicago, IL, May 6-9.
5. Kambis TN, Kar S, **Mishra PK** (2022). miR-133a mitigates ferroptosis by attenuating fatty acid metabolism in the diabetic heart. Experimental Biology meeting. April 2-5.
6. Shahshahan HR, Hackfort BT, **Mishra PK** (2021). Cardiac-specific transgenic MMP9 overexpression induces cardiac remodeling. Experimental Biology meeting. April 27-30. Virtual.
7. Kar S, Shahshahan HR, **Mishra PK** (2020). Hydrogen sulfide protects the heart against ferroptosis in diabetic cardiomyopathy. Presented at 2020 Iowa Physiological Society and Midlands Society of Physiological Sciences Scientific Sessions. Virtual meeting. October 30-31 (Received the Outstanding Graduate Student Oral Presentation Award).
8. Yadav SK, **Mishra PK** (2019). Ablation of MMP9 prevents cardiac pyroptosis of $Ins2^{+/-}$ T1DM mice heart. Presented at "The Midlands Society of Physiological Sciences". Omaha, NE, October 26 (Received 1st Prize in Poster Presentation in Postdoctoral category).
9. Kar S, Yadav SK, Goyal R, Lefer DJ, **Mishra PK** (2019). Hydrogen sulfide protects the heart against homocysteine-induced remodeling by regulating autophagy and pyroptosis. Presented at "The Midlands Society of Physiological Sciences". Omaha, NE, October 26 (Received 1st Prize Poster Presentation in Predoctoral category).

10. Kar S, Yadav SK, Goyal R, Lefer DJ, **Mishra PK** (2019). Hydrogen sulfide protects the heart against homocysteine-induced remodeling by regulating autophagy and pyroptosis. AHA BCVS meeting, Boston, July 20- August 1.
11. Shahshahan HR, Kar S, **Mishra PK** (2018). Hydrogen sulfide protects against homocysteine-induced cardiac remodeling and dysfunction. Presented in Nebraska Physiological Society meeting, Omaha, NE, October 2018. (Received Poster Award in the Graduate category).
12. Yadav SK, **Mishra PK** (2018). Ablation of MMP9 prevents cardiac pyroptosis of $Ins2^{+/-}$ T1DM mice heart. Presented in Nebraska Physiological Society meeting, Omaha, NE, 2018. (Received Poster Award in the Postdoctoral category).
13. Nandi SS, **Mishra PK** (2018). Cardiac-specific overexpression of miR-133a in the diabetic heart mitigates mitochondrial abnormality by targeting TIM17a. Experimental Biology meeting, San Diego, CA. (Selected for the Caroline tum Suden/Frances Hellebrandt Professional Opportunity Award).
14. Yadav SK, **Mishra PK** (2018). Ablation of MMP9 prevents cardiac pyroptosis of $Ins2^{+/-}$ T1DM mice heart. Experimental Biology meeting, San Diego, CA.
15. Kambis TN, Yadav SK, **Mishra PK** (2018). Cardiac-specific overexpression of miR-133a decreases pyroptosis in $Ins2^{+/-}$ T1DM mice heart. Experimental Biology meeting, San Diego, CA.
16. Marta P, Yadav R, Nandi SS, Shahshahan HR, **Mishra PK** (2017). Role of homocysteine and hydrogen sulfide donors on cell death signaling in HL1 cardiomyocytes. Presented in Nebraska Physiological Society meeting 2017, Omaha, NE. (Received Poster Award in the Undergraduate category).
17. Nandi SS, **Mishra PK** (2017). MiR-133a improves beta-adrenergic receptors sensitivity in hyperglycemic cardiomyocytes. American Diabetes Association Scientific Session meeting, San Diego, CA, June 9-13.
18. Nandi SS, **Mishra PK** (2017). Ablation of MMP9 upregulates autophagic flux in the diabetic heart. Experimental Biology meeting, Chicago, IL, April 25. (Received the Research Recognition Award of APS. Also, Winner of the 2017 Caroline tum Suden/Frances Hellebrandt Professional Opportunity Award).
19. Nandi SS, **Mishra PK** (2017). Hydrogen sulfide controls CTH-CBS feedback regulation by inducing miR-133a and suppressing SP1 in a dose-dependent manner in cardiomyocytes. Experimental Biology meeting, Chicago, IL, April 26.
20. Zucker IH, Rozanski GJ, **Mishra PK**, Wang H (2017). Cardiac spinal sensory endings mediate remodeling in the post MI state. U-CARS Utah Cardiac Recovery Symposium, University of Utah School of Medicine, UT, January 12-13.
21. Nandi SS, **Mishra PK** (2016). Hydrogen sulfide controls CTH-CBS feedback regulation by inducing miR-133a and suppressing SP1 in a dose-dependent manner in cardiomyocytes. Nebraska Physiological Society meeting, Omaha, NE, October 15.
22. Nandi SS, **Mishra PK** (2015). MiR-133a regulates cardiac autophagy in diabetics. Annual meeting of the international academy of cardiovascular sciences (IACS): North American Section" held in Omaha, NE, September 10-12 (Received the Morris Karmazyn Award for the Best Poster in Translational Medicine).
23. Sharma NM, Nandi SS, Liu X, Zheng H, **Mishra PK**, Patel KP (2015). Upregulation of angiotensinogen in the paraventricular nucleus of the hypothalamus during chronic heart failure: Role of miR-133a. Annual meeting of the international academy of cardiovascular sciences (IACS): North American Section" held in Omaha, NE, September 10-12 (Received the Eric Olson Young Faculty Award).
24. Hackfort BT, Prathipati P, **Mishra PK** (2015). Role of hydrogen sulfide in the regulation of DNA methyl transferases in cardiomyocytes. Nebraska Physiological Society meeting, held in University of South Dakota, SD, October 10 (Received the Best Poster Presentation Award).
25. Prathipati P, Hackfort BT, Nandi SS, Shahshahan HR, **Mishra PK**. Ablation of MMP9 alleviates mitophagy and mitigates cardiac dysfunction in diabetics. Nebraska Physiological Society meeting, held in University of South Dakota, SD, October 10 (Received the Oral Presentation Award).
26. Nandi SS, **Mishra PK** (2015). MiR-133a mitigates mitophagy in Ins2+/- diabetic heart. Experimental Biology, March 28- April1, Boston, MA (Selected for the Oral Presentation).
27. Wang Hanjun, **Mishra PK**, Nandi SS, Cornish KG, Zucker IH (2014). Cardiac sympathetic denervation improves cardiac inflammation and ameliorates cardiac remodeling in post-MI rats. AHA, High Blood Pressure Research, San Francisco, CA, September 9-12

28. Nandi SS, Chavali V, **Mishra PK** (2014). MiR-133a alleviates cardiac autophagy by targeting AMPK in Ins2+/- diabetic mice. Experimental Biology, April 26-30, San Diego, CA (Selected for the Oral Presentation).
29. Nandi SS, Liu X, Zheng H, Sharma H, Chavali V, Patel KS, **Mishra PK** (2014). MiR-133a ameliorates cardiac dysfunction in diabetes: possibly by restoring β-adrenergic receptor function and expression. Experimental Biology, April 26-30, San Diego, CA (Selected for the Oral Presentation).
30. **Mishra PK**, Nandi SS, Chavali V (2014). Mdivi-1 mitigates cardiac dysfunction by attenuating mitophagy in diabetes. Experimental Biology, April 26-30, San Diego, CA
31. Chavali V, Nandi SS, **Mishra PK** (2013). Mitochondrial division inhibitor (Mdivi-1) ameliorates diabetic cardiomyopathy by attenuating mitophagy and DNA methylation. Nebraska Physiological Society Meeting, October 4, University of Nebraska, Omaha, NE
32. Nandi SS, Chavali V, **Mishra PK** (2013). MiR-133a mitigates autophagy by regulating AMPK/mTOR signaling and ameliorates diabetic cardiomyopathy. Nebraska Physiological Society Meeting, University of Nebraska, Omaha, NE, October 4,
33. Chavali V, Metreveli N, Tyagi S, **Mishra PK** (2013). Mitochondrial division inhibitor (Mdivi-1) mitigates autophagy and DNA methylation and ameliorates diabetic cardiomyopathy. The cardiovascular Forum for Promoting Centers of Excellence and Young Investigators, Louisville, KY, August 15-17 (Selected for the James Willerson Clinical Award Lecture).
34. **Mishra PK**, Chavali V, Metreveli N, Tyagi SC (2013). Ablation of MMP9 ameliorates epigenetic modifications and mitigates diabetic cardiomyopathy. Experimental Biology, April 20-24, Boston, USA.
35. Qipshidze N, **Mishra PK**, Tyagi SC (2013). Mitochondrial division inhibitor (Mdivi-1) ameliorates post-myocardial infarction via stimulating stem cell by elevating levels of miR-499 in diabetes. Experimental Biology, April 20-24, Boston, MA
36. Chavali V, Diaz NL, Tyagi SC, **Mishra PK** (2013). MiR-133a ameliorates cardiac stem cell survival and differentiation in Insulin 2 mutant diabetic mice. Experimental Biology, April 20-24, Boston, MA
37. Chavali V, Harris J M, Givvimani S, Qipshidze N, Murphy LA, Tyagi G, Metreveli N, Tyagi SC, **Mishra PK** (2013). Exercise ameliorates high fat diet mediated inflammation, DNA methylation and heart failure in female mice. Experimental Biology, April 20-24, Boston, MA
38. **Mishra PK**, Chavali V, Metreveli N, Tyagi SC (2012). Targeted deletion of MMP9 mitigates autophagy mediated contractile dysfunction in Insulin 2 mutant diabetic mice. AHA, Scientific Session, November 3-7, Los Angeles, CA.
39. **Mishra PK**, Metreveli N, Chavali V, Tyagi N, Qipshidze N, Sen U, Joshua IG, Tyagi SC. (2012). Role of MMP9 in cardiac stem cell differentiation and autophagy. Experimental Biology, April 21-25, San Diego, CA
40. Chavali V, Tyagi N, Tyagi SC, **Mishra PK**. (2012). MiR-133 as an epigenetic regulator of diabetic heart failure. Experimental Biology, April 21-25, San Diego, CA
41. **Mishra PK**, Chavali V, Sathur P, Qipshidze N, Tyagi SC (2012). H_2S ameliorates homocysteine mediated attenuation of miR-133 and β2-AR in diabetic hearts. 2nd International Conference on H_2S Biology and Medicine, September 20-22, Atlanta, GA. (Received the Best Poster Award).
42. Qipshidze N, **Mishra PK,** Givvimani S, Sen U, Tyagi SC (2012). Hydrogen sulfide protects coronary vasospasm after myocardial infarction and eliminates myocardial infarction zone by promoting to grow new vessels. 2nd International Conference on H_2S Biology and Medicine, September 20-22, Atlanta, GA
43. **Mishra PK**, Chavali V, Metreveli N, Tyagi SC (2012). Targeted deletion of MMP9 mitigates autophagy mediated contractile dysfunction in Insulin2 mutant diabetic mice. Scientific Session, American heart Association, November 3-7, Los Angel, CA
44. Tyagi N, Narayanan N, **Mishra PK**, Qipshidze N, Givvimani S, Tyagi SC (2012). Epigenetic reprogramming of mitochondrial dysfunction in hyperhomocysteinemia. Experimental Biology, April 21-25, San Diego, CA
45. **Mishra PK**, Joshua IG, Tyagi SC. (2012). Exercise mitigates beta2-adrenergic receptor dysfunction by decreasing homocysteine in diabetes. Experimental Biology, April 21-25, San Diego, CA
46. Tyagi N, Qipshidze N, Munjal C, Metreveli N, Dankowski A, **Mishra PK**, Sen U, Lominadze D, Givvimani S, Tyagi SC (2011). Hydrogen sulfide ameliorates mitochondrial MMP-9 mediated mitochondrial remodeling in cerebral ischemia. Experimental Biology, April 9-13, Washington, DC

47. **Mishra PK**, Awe O, Metreveli N, Qipshidze N, Munjal C, Tyagi N, Tyagi SC. (2011). Exercise ameliorates diabetic cardiomyopathy by inducing beta2-adrenergic receptors and miR-133a, and attenuating MMP-9. Experimental Biology, April 9-13, Washington, DC
48. Munjal C, Tyagi N, Qipshidze N, **Mishra PK**, Givvimani S, Sen U, Lominadze D, Tyagi SC (2011). The siRNA targeting MMP-9 mitigates homocysteine- induced disruption of barrier integrity in human intestinal microvascular cells. Experimental Biology, April 9-13, Washington, DC
49. Sen U, Qipshidze N, Givvimani S, **Mishra PK**, Munjal C, Tyagi N, Tyagi SC (2011). Hydrogen sulfide mitigates homocysteine- mediated mitophagy. Experimental Biology, April 9-13, Washington DC
50. Qipshidze N, **Mishra PK**, Metreveli N, Lominadze D, Tyagi SC (2011). Hydrogen sulfide improves angiogenesis and regulates cardiac function and structure during myocardial infarction in mice. Experimental Biology, April 9-13, Washington, DC
51. **Mishra PK**, Metreveli N, Givvimani S, Panguluri SK, Sen U, Tyagi N, Basu P, Munjal C, Joshua IG, Tyagi SC. (2010). Ablation of MMP-9 ameliorates miR-1 and -133 mediated cardiac dysfunction in insulin2 mutant diabetic mice. (Presented at the Harry Goldblatt New Investigator Award Lecture 2010 AHA High Blood Pressure Research). Received the *Best of HBPR* 2010. Invited Presentation in the Best of AHA specialty conference at the Scientific Session of AHA, Chicago, IL.
52. Kandel M, Tyagi N, Qipshidze N, Munjal C, Basu P, Givvimani S, Abe O, **Mishra PK,** Sen U, Tyagi SC (2010). Folic acid mitigated homocysteine-mediated decrease in bone blood flow and bone remodeling. Experimental Biology, April 24-28, Anaheim, CA
53. Givvimani S, Jala R, **Mishra PK**, Sen U, Tyagi N, Qipshidze N, Munjal C, Tyagi SC. (2010). Functional heterogeneity in vascular remodeling (MMP-9-/- and PAR-1-/+) in hyperhomocysteinemic (CBS-/+) and diabetic (Akita, Ins2-/+) mice. Experimental Biology, April 24-28, Anaheim, CA
54. **Mishra PK**, Givvimani S, Sen U, Abe OA, Tyagi N, Basu P, Munjal C, Tyagi SC. (2010). Role of dicer in diabetic cardiomyopathy through dysregulation of MMP-9 and TIMP-4. Experimental Biology, Anaheim, CA, April 24-28
55. Tyagi N, Qipshidze N, Givvimani S, Kandel M, **Mishra PK**, Sen U, Johar A, Tyagi SC (2010). Tetrahydrocurcumin ameliorates mtMMP-9 mediated mitophagy and mitochondria remodeling in Stroke. Experimental Biology, April 24-28, Anaheim, CA
56. Munjal C, Falcon JF, Qipshidze N, **Mishra PK**, Tyagi SC (2010). DDAH-2 & eNOS in Mesenteric Vascular Remodeling: Role of Fenugreek. Experimental Biology, April 24-28, Anaheim, CA
57. Basu P, Qipshidze N, Sen U, **Mishra PK**, Tyagi SC (2010). Blood flow regulates vasculature by maintaining elastin /collagen and MMP/ TIMP ratio. Experimental Biology, April 24-28, Anaheim, CA
58. **Mishra PK,** Metreveli N, Givvimani S, Kundu S, Tyagi N, Qipshidze N, Sen U, Basu P, Abe OA, Gillespie WM, Munjal C, Vacek J, Tyagi SC (2009). Downregulation of dicer involved in MMP-9 mediated cardiomyocytes dysfunction. 63rd High Blood Pressure Research Conference, September 23-26, Chicago, IL
59. Tyagi N, S Kundu, N. Qipshidze, **Mishra PK**, S. Givvimani, S. Tyagi (2009). Cardiac- specific deletion of N-methyl-D-aspartate R1 ameliorates mitochondrial connexin-43 translocation and mitochondrial MMP-9 activity in hyperhomocysteinemia. Basic cardiovascular Sciences Conference. July 20-23, Las Vegas, NV
60. Kumar M, Givvimani S, Sathnur PB, **Mishra PK**, Kundu S, Rodriguez-Alvarez WE, Tyagi N, Sen U, Tyagi SC (2009). Cerebro-protective role of tetra-hydro-curcumin in hyperhomocysteinemic ischemic mine by regulating NF-kB. Experimental Biology, April 18-22, New Orleans, LA
61. Tyagi N, Givvimani S, Kumar M, Kundu S, Gillespie W M, **Mishra PK**, Sathnur P, Lominadze D, Sen U, Tyagi SC (2009). Curcumin reduces matrix metalloproteinase-9 expression and ameliorates blood brain barrier dysfunction in stroke. Brain & Brain PET 09 conference Chicago, IL
62. **Mishra PK** Tyagi N, Kumar M, Kumar M, Kundu S, Givvimani S, Sen U, Tyagi SC (2009). Role of microRNAs in homocysteine-induced oxidative stress. Experimental Biology, April 18-22, New Orleans, LA

C. RESEARCH SUPPORT

Active Grants

1. National Institutes of Health, 1 P50AA030407: *Alcohol Center of Research-Nebraska (ACORN).* January 01, 2022- December 31, 2027; Direct cost: $1,035,000. Total amount $1,569,501.
   Role: Co-Investigator (5% FTE). PI: Casey CA.

2. University of Nebraska Collaboration Initiative grant: *Myocardial cell death mechanism due to TEVAR-induced aortic stiffening.* July 1, 2023- June 30, 2025; Direct Costs: Year/ Total: 2/ $97,032.
   Role: Co-Investigator. PI: Desyatova A.

3. National Institutes of Health, R56HL156806: *Mechanism of metabolic remodeling in the diabetic heart.* September 22, 2022- August 31, 2024; Direct cost: $ 262,212.
   Role: Principal Investigator

4. National Institutes of Health, R01 HL155618: *The role of hemoglobin alpha in diabetes-related vascular dysfunction.* August 2021(effective date August 2022)- July 2026; Direct cost: $324,490
   Role: Co-Investigator (3% FTE); PI: Bagher P.

Past grants

5. University of Nebraska Collaboration Initiative grant: *Role of MMP9 in cardiac lipid peroxidation in T1DM.* July 1, 2022- June 30, 2024; Direct Costs: Year/ Total: 2/ $149,982
   Role: Principal Investigator

6. University of Nebraska Collaboration Initiative grant: *Hydrogen sulfide as a biomarker in patients with peripheral artery disease.* July 1, 2022- June 30, 2024; Direct Costs: Year/ Total: 2/ $143,660
   Role: Co-Investigator. PI: Park SY.

7. UNMC College of Medicine Bridge Grant: *Myocardial cell death in hypertensive diabetes.* August 1, 2022- July 30, 2024; Direct Costs: Year/Total: 2/ $100,000
   Role: Principal Investigator
8. National Institutes of Health, P20GM104320 (PI: Zempleni J)/Nebraska Center for the Prevention of Obesity Pilot grant: *Gut dysbiosis in diabetic cardiomyopathy*. January 1, 2021- June 30, 2022; Direct Costs: Year/ Total: 2/ $200,000
   Role: Principal Investigator.

9. University of Nebraska Collaboration Initiative grant: *H_2S Therapeutics for Myocardial Ferroptosis in Diabetes.* July 1, 2021- June 30, 2023. Direct Costs: Year/Total: 2/ $149,924.
   Role: Principal Investigator

10. University of Nebraska Collaboration Initiative grant: *Maternal Diabetes and Mitochondrial Dysfunction in Fetal Heart.* July 1, 2021- June 30, 2023. Direct Costs: Year/Total: 2/ $150,000
    Role: Co- Investigator. PI: Wood J

11. National Institutes of Health, U54GM115458 (PI: Lindsey ML)/Center for Heart and Vascular Research Pilot grant: *Targeted delivery of H_2S to mitigate cell death in obesity/diabetes-induced cardiomyopathy* January 1, 2020- June 30, 2021; Direct Costs: $50,000
    Role: Principal Investigator.

12. National Institutes of Health, R01 HL129823: *Systems biology of fibroblast activation following myocardial infarction.* July 1, 2020- April 30, 2021 (my participation). Direct cost: Year/Total: 4 / $1, 250,000
    Role: Collaborator. PI: Lindsey ML.

13. University of Nebraska Collaboration Initiative grant: *miRNA-based Therapeutic Strategy for Diabetic Breast Cancer.* July 1, 2020- June 30, 2022. Direct Costs: Year/Total: 2/ $149,064.
    Role: Co-Investigator. PI: Chandra S

14. National Institutes of Health, R01 HL126796: *NHLBI UTHSCSA Cardiovascular Proteomics Center.* December 1, 2015- November 30, 2019; Direct cost: Year/Total: 4 / $1, 250,000
    Role: Co-Principal Investigator. PI: Zucker IH / Wang HJ

15. National Institutes of Health, R01 HL116205: *Exercise and H_2S mitigate homocysteine-mediated beta2-adrenergic receptor.* July 1, 2014- December 31, 2019; Direct cost: Year/Total: 6 / $1, 250,000
    Role: Principal Investigator

16. National Institutes of Health, R01 HL113281: *Inflammation, miRNA, and autophagy in diabetes.* September 1, 2013- July 31, 2020; Year/Total: 7/ $1, 250,000.
    Role: Principal Investigator

17. American heart Association Beginning Grant-In-Aid, 11BGIA 9690055. *Role of MMPs in miRNA-mediated diabetic cardiomyopathy.* July 1, 2011-June 30, 2013 (relinquished from May 30,2013 due to moving to UNMC). Direct cost: Year/Total: 2/$130,000
    Role: PI: Principal Investigator

D. INVITED LECTURES AT INSTITUTIONS

COMMUNITY

1. *A potential new therapeutic strategy for diabetes-induced heart failure*. North Omaha Community Care Council meeting. September 8, 2021

UNIVERSITY

2. *Role of MMP9 in diabetic cardiomyopathy*. Institute of Cellular Therapeutics, University of Louisville, Louisville, Kentucky. January 2013.
3. *Multifaceted role of miR-133 in the heart*. Department seminar in the Department of surgery at UNMC. September 2013.
4. *Novel regulatory mechanisms of diabetic cardiomyopathy*. Department of Internal Medicine, UNMC. January 2014.
5. *Role of miRNA in cardiac remodeling*. M.D. /Ph.D. Scholar Program Luncheon meeting at UNMC. April 2014.
6. *Regulating the regulators of autophagy in diabetic hearts*. The Nebraska Gateway to Nutrigenomics Seminar series, University of Nebraska-Lincoln. October 2014.
7. *Mechanism of pathological cardiac remodeling in diabetics*. Department of Pharmacology, UNMC. April 2014.
8. *Autophagy and miRNA in diabetic heart failure*. Cardiology Grand Round at UNMC. February 2015.
9. *MicroRNA: From Bench side to clinical trials*. Department of Genetics, Cell Biology and Anatomy. November 2016.
10. *A novel therapeutic strategy for diabetic cardiomyopathy*. VA Medical Center, NE. December 2016.
11. *Programming death for life: unique mechanisms for cell death*. Cellular and Integrative Physiology, UNMC. August 2017.
12. *Cell death at the heart of diabetes*. Department of surgery, UNMC. September 2019.
13. *Micromanaging the "sweet" heart to prevent heart failure*. VA Medical Center, NE. February 2022.

NATIONAL

14. *MicroRNA and MMP9 in the diabetic heart*. Department of Physiology, Wayne State University, Detroit, Michigan. November 2012.
15. *MicroRNA and MMP9 in the diabetic hear*t. Department seminar at the Cellular and Integrative Physiology, UNMC. January 2013.
16. *MicroRNA and MMP9 in the diabetic heart.* Learner Research Institute, Cleveland Clinic, Cleveland, Ohio. January 2013.
17. *Regulating autophagy in diabetic hearts*. School of Medicine Basic Biomedical Sciences, University of South Dakota. September 2016.
18. *MicroRNOmics of diabetic cardiomyopathy: From regulatory RNA to therapeutic candidate*. Department of Functional Tissue Engineering, North Carolina University, North Carolina. August 2018.
19. *Micromanaging cardiac remodeling to develop treatment for diabetic cardiomyopathy*. Vascular Biology Center Research Seminar series at the Medical College of Georgia. Augusta. February 2019.
20. *Micro-managing complex pathogenesis of the diabetic heart*. Animal & Comparative Biomedical Sciences, University of Arizona, April 2022.
21. *Protecting the "sweet" heart: Targeting diabetes-induced heart failure*. Department of Cell and Molecular Biology, University of Mississippi Medical Center, May 2023.

INTERNATIONAL

22. *MicroRNA at the Heart of Diabetes*. International Webinar organized by the South Asian University, Faculty of Life Sciences and Biotechnology, New Delhi, India. August 26, 2021.

E. INVITED LECTURE AT CONFERENCES

NATIONAL

1. *Ablation of MMP9 ameliorates miR-1, and miR-133 mediated cardiac dysfunction in Insulin2 mutant diabetic mice*. Harry Goldblatt Award Lecture, AHA Hypertension Council, November 2010
2. *Exercise ameliorates diabetic cardiomyopathy by inducing beta-2 adrenergic receptors and miR-133a, and attenuating MMP9*. Experimental Biology meeting Featured topic "Fibroblast-cardiomyocyte signaling", April 2011.
3. *Exercise mitigates beta2-adrenergc receptor dysfunction by decreasing homocysteine in diabetes*. Experimental Biology meeting Featured topic "Effect of exercise and nutritional perturbations on cumulative muscle protein synthesis", April 2012.
4. *Ablation of MMP9 ameliorates epigenetic modifications and mitigates diabetic cardiomyopathy*. Experimental Biology meeting Featured topic "MicroRNA and stem cell in muscle pathophysiology", April 2013.
5. *Cardioprotective role of miR-133a in diabetic hearts*. The Cardiovascular Forum for Promoting Centers of Excellence and Young Investigators, Louisville, Kentucky, August 2013.
6. *Novel cardioprotective role of miR-133a*. Annual Meeting of the International Academy of Cardiovascular Sciences: North American section, Omaha, Nebraska, September 2015.
7. *MicroRNA-autophagy axis in diabetic hearts*. 9th Global Diabetologists Annual Meeting and Medicare Expo, Dallas, Texas, January 2016.
8. *A novel role for cardiac tyrosine aminotransferase in miR-133a-mediated regulation of contractility of diabetic hearts*. Annual meeting of the International Academy of Cardiovascular Sciences: North American section, 5th Annual Forum to Promote Young Investigators and Centers of Excellence in Cardiovascular Sciences, Orlando, Florida, September 2017.
9. *Targeting diabetic cardiomyopathy: challenges and a potential therapy*. 13th World Congress of International Society for Adaptive Medicine, Orlando, Florida, October 2022.

INTERNATIONAL

10. *Genetic deletion of MMP9 induces miRNA and ameliorates heart failure in diabetics*. International symposium on "Population genetics and chromatin dynamics, Banaras Hindu University, Varanasi, INDIA, January 2012.
11. *Cardioprotective role of miR-133 in diabetic hearts*. 2nd Cardiovascular Forum for Promoting Centers of Excellence and Young Investigators, Winnipeg, Manitoba, CANADA, September 2014.
12. *MICRO-managing cardiac autophagy to ameliorate diabetic cardiomyopathy*. Trends in Biochemical and Biomedical Research: Advances and Challenges, Banaras Hindu University, Varanasi, INDIA, February 2018.
13. *Pyroptosis in diabetic cardiomyopathy.* International conference on Emerging Research in Bioscience, Guru Ghasidas Vishwavidyalaya, INDIA, October 2018.
14. *miRNA at the Heart of diabetes and COVID-19*. Diabetes Conclave 2021, VIRTUAL, March 2021. https://diabetesconference.mindauthors.com/speakers/

KEYNOTE SPEAKER

15. *Role of miRNA in prevention of diabetes-induced heart failure*. International e-Conference on Recent Advances in Life Sciences with Reference to Disease, Disorder and Adaptations. Lalit Narayan Mithila University, INDIA, July 2021. https://www.youtube.com/watch?v=RbrUTHVbUjA (starts at 1:14:56)

F. ORGANIZING SCIENTIFIC SESSIONS / CONFERENCES

1. Euro Weight Loss-2015, Frankfurt, GERMANY, August 2015
2. Annual meeting of the International Academy of Cardiovascular Sciences: North American Section, Nebraska, USA, September 2015. In addition to organization, deliver a talk, and co-chaired a scientific session.
3. Midlands Physiological Society Scientific Session, October 2020, Nebraska
4. Midlands Physiological Society Scientific Session, October 2021, Nebraska
5. Midlands Physiological Society Scientific Session, October 2022, Nebraska

G. SOCIAL MEDIA: Podcasts for the *American Journal of Physiology (AJP)- Heart and Circulatory Physiology*

AUTHOR

1. October 23, 2019: Guidelines for Evaluating Myocardial Cell Death
   https://ajpheart.podbean.com/e/guidelines-for-evaluating-myocardial-cell-death/

CONTENT EXPERT

2. July 15, 2016: miR-140 and Right heart Hypertrophy
   https://ajpheart.podbean.com/e/mir140-and-right-heart-hypertrophy/?comments=true
3. March 23, 2018: MicroRNA translocation into the Mitochondria
   https://ajpheart.podbean.com/e/microrna-translocation-into-the-mitochondria/

HOST

4. August 6, 2021: Cardiomyocyte-specific Txnip C247S mutation improves left ventricular functional reserve in streptozotocin-induced diabetic mice.
   https://podcasts.apple.com/us/podcast/txnip-c247s-mutation-improves-cardiac-function-in-diabetes/id439721739?i=1000531218407

III. TEACHING

A. GROUP LEARNING

1. GRANT WRITING BOOTCAMP
   Instructor: Great Plains IDeA-CTR/CHVR Grant Writing Bootcamp.
   2021 (Sept -Nov): Reviewed Aims page, Biosketch, and Research Strategy drafts of NIH RO1 applications for a small group (4 Junior investigators).

2. CHAIR JOURNAL CLUB OF CIP GRADUATE STUDENTS
   2016-18: 1 contact hour/week journal club with all CIP graduate students. Journal club and preparing students for department seminar presentation.

B. LECTURES

UNIVERSITY OF LOUISVILLE, KENTUCKY (2010-12)

Instructor- Methods in Physiology Research (Total Contact hours: 36)

- Delivered lectures and hands-on training on flow cytometry principles and applications in basic science and the pharmaceutical industry.
- Conducted interactive sessions (3 contact hours per week for 4 weeks annually), combining theoretical instruction (1 hour) and practical demonstrations (2 hours).
- Provided hands-on experience in sample preparation, experimental controls, instrument operation, data acquisition, analysis, and interpretation.
- Guided students in distinguishing high-quality data from artifacts and troubleshooting experimental challenges.

UNIVERSITY OF NEBRASKA MEDICAL CENTER, NEBRASKA (2013-present)

- Course Director, CIP 916 (2020–2023) – Designed and managed the course syllabus, coordinated invited instructors, actively participated in weekly classes, and developed and graded exam questions.
- Course Director, MEP 916 (2022–Present) – Led course preparation, coordinated instructors, facilitated student communication, monitored and engaged in the Weekly Discussion Board, designed quizzes and exams, and assessed students on a weekly basis.
- Instructor, CIP 916 – Developed course materials, prepared and graded exam questions.
- Instructor, 606/608 – Created teaching materials, designed exam questions, and evaluated student performance.
- Instructor, MEP 916 and MEP 901 – Designed and delivered asynchronous teaching materials, engaged in weekly discussion boards, developed quizzes and exams, and evaluated student performance.
- Instructor, MEP 806 – Reviewed lecture content, formulated exam questions, and graded student assessments.
- Instructor, Graduate Physiology I (801) – Prepared exam questions based on 606/608 Muscle Physiology and Medical Circulatory Block Heart Physiology lectures and evaluated student exam performance.
- Instructor, Graduate Physiology II (802) – Reviewed lecture materials with students based on 606/608 Sensory Physiology lectures, prepared exam questions, scored exams, and assigned grades.
- Instructor, Graduate Physiology Recitation (CIP 807) – Reviewed and discussed lectures on Sensory Systems Physiology from 606/608, reinforcing key concepts for students.
- Instructor, Medical Circulatory Block – Developed teaching materials, designed exams, and assessed students' understanding of circulatory physiology.

Student Evaluations:

- Teaching evaluations (on a scale of 1–5, where 5 is excellent) are included where applicable.

Year	Course	Contact hours	Year, Evaluation (# students)
2013	Cardiopulmonary Function in Health and Disease (CIP 916) • Mechanisms of Cardiac Hypertrophy	2 h	
2014-23	Intermediate/Graduate Physiology (CIP 606/608) • Sensory Systems Physiology	11 h / y Total = 110 h	2014: 3.72 (89) 2015: 4.18 (85) 2016: 4.43 (122) 2017: 4.28 (124) 2018: 4.21 (128) 2019: 4.37 (133) 2020: 4.74 (123) 2021: 4.41 (124) 2022: 4.83 (125) 2023: 4.83 (124)
2015, 2017-20	Cardiopulmonary Function in Health and Disease (CIP 916) • Mechanisms of Cardiac Hypertrophy • Advanced Techniques on miRNA assay/Autophagy	• 2 h • 2 h Total = 20 h (4x5)	2017: 5.0 (5) 2018: 4.4 (5) 2019: 4.9 (5) 2020: 4.9 (7)
2015	Graduate Physiology Recitation (CIP 807)	1 h	
2017-24	Graduate Physiology II (IPMM 802) • Sensory Systems Physiology	1h Total = 8 h (8x1)	
2022	Cardiopulmonary Function in Health and Disease (CIP 916) • Mechanisms of Cardiac Hypertrophy • Advanced Techniques on miRNA assay/Autophagy	• 2 h • 2 h Total = 4 h	5.0 (3)
2023-	Masters in Physiology (Asynchronous) • Molecular Mechanisms of Cardiovascular Pathophysiology (MEP916) • Advanced Topics in Physiology (MEP 901) • Medical Physiology (MEP 806)	Online class • 68 h (17w x 4h) • 4 h • 4 h Total = 156 h (76x 2)	
2024-	Intermediate/Graduate Physiology (CIP 606/608) • Sensory Systems Physiology • Muscle Physiology (Skeletal and Heart Muscles)	• 9 h • 8 h Total = 17 h / y	• 4.38 (124) • 3.3 (130)
2025-	Medical Physiology • Circulatory Block (Heart Physiology) • Graduate Physiology I (IPMM 801)	• 5 h • 2h	• 4.0 (120)

C. MENTOR OF TRAINEES/FELLOWS

1. Primary Mentor

UNDERGRADUATE STUDENT

Year	Name	Degree/Research	Institution
2012	Lawrence A. Murphy	B.S./Summer Research	Dept. of Physiology & Biophysics, University of Louisville, KY
2013	Pranay Velachery	Junior /Summer Research	Dept. of Cellular and Integrative Physiology, UNMC, NE
2014	Vikash Mudgapalli	Sophomore/Summer Research	Dept. of Cellular and Integrative Physiology, UNMC, NE
2014	Santosh Ramini	Sophomore/Summer Research	Dept. of Cellular and Integrative Physiology, UNMC, NE
2017	Patrick Martha	B.S./Summer Research	Dept. of Cellular and Integrative Physiology, UNMC, NE
2018	Keerthi Shaik	B.S./Summer Research	Dept. of Cellular and Integrative Physiology, UNMC, NE
2023	Noah J. Needle	Summer Undergraduate Research Program	Dept. of Cellular and Integrative Physiology, UNMC, NE

M.S. STUDENT

Year	Name	Thesis title	Institution
2011-12	Camille Brunson	The role of MMP9 in diabetic cardiomyopathy	Dept. of Physiology & Biophysics, University of Louisville, KY
2011-12	Leiberh Noel Diaz	The role of Matrix Metalloproteinase-9 on stem cell survival and differentiation in diabetic microenvironment	Dept. of Physiology & Biophysics, University of Louisville, KY
2011-12	Jessica Harris	Exercise mediated autophagy in the diabetic heart	Dept. of Physiology & Biophysics, University of Louisville, KY

Ph.D. STUDENT

Year	Name	Thesis title	Institution
2018-20	Sumit Kar	Cardioprotective roles of hydrogen sulfide donors in diabetic cardiomyopathy	Dept. of Cellular and Integrative Physiology, UNMC, NE
2017-22	Tyler N Kambis	Determining the role of miR-133a in the diabetic heart	Dept. of Cellular and Integrative Physiology, UNMC, NE
2022-24	Flobater I Gawargi	Regulatory roles of matrix metalloproteinase-9 in diabetic cardiomyopathy	Dept. of Cellular and Integrative Physiology, UNMC, NE

PhD and MD/PhD ROTATING STUDENT

Year	Name	Degree	Institution
2013	Shamma S. Rahman	Ph.D.	UNMC
2014	Denise A. Cobb	Ph.D.	UNMC
2015	Paul Sarjo	Ph.D.	UNMC
2015	Anyum Ma	Ph.D.	UNMC
2016	Ahmad M. Wafi	Ph.D.	UNMC
2016	Stephan J. Haller	M.D./Ph.D.	UNMC
2017	Salma Sharmin	Ph.D.	UNMC
2017	Kambis N. Tyler	Ph.D.	UNMC
2017	Hannah L. Harris	Ph.D.	UNMC
2018	Sydney E. Greer	Ph.D.	UNMC
2018	Kristina Pravoverov	M.D./Ph.D.	UNMC
2018	Brady Betten	Ph.D.	UNMC
2018	Sumit Kar	Ph.D.	UNMC
2021	Deepan Chatterjee	Ph.D.	UNMC
2021	Brigham J. Killips	Ph.D.	UNMC
2021	Flobater I Gawargi	Ph.D.	UNMC
2022	Sarah Pribil	Ph.D.	UNMC
2023	Colman I Freel	M.D./Ph.D.	UNMC
2023	Misha Y. Ginsvind	Ph.D.	UNMC
2023	Isaac Adediji	Ph.D.	UNMC

POSTDOCTORAL FELLOW

Year	Name	Publications
2011- 14	Vishalakshi Chavali	Published 4 research (two 1st, two co-author) and 2 review articles (one 1st and one co-author), and 2 book chapters (one 1st and one co-author). She has also published 7 conference-based abstracts. She has poster/Oral presentations at national and local conferences/meetings.
2013- 18	Shyam S Nandi	Published 7 research (Four 1st and three co-author), 3 review articles (one 1st and two co-author), 2 book chapter (one 1st and one co-author), and 13 conference-based abstracts
2014-15	Varun Kesherwani	Published 3 first-author research papers
2015-16	Priyanka Prathipati	Published 1 first-author research and 1 first-author review articles, and 1 conference-based abstract.
2015-16	Bryan T Hackfort	Published 1 co-author research article and 1 first author review article
2017-18	Roopali Yadav	Published 1 co-author paper
2017-20	Santosh Yadav	Published 8 research papers (four 1st author and four co-author) and 1 conference-based abstract

2. Primary Trainee's honors and awards

PREDOCTORAL FELLOWS

- Sumit Kar, PhD (2018-20):
  Sumit's exceptional planning and execution skills enabled him to complete his PhD in just two and a half years, securing a leadership role in a company even before his defense. He now excels as the Associate Director of Translational Medicine at Revolution Medicines in San Francisco.

  - 2018: Poster Presentation Award, Nebraska Physiological Society Meeting, Omaha, NE
  - 2019: 1st Prize in Poster Presentation Award, Midlands Society of Physiological Sciences meeting, Omaha, Omaha, NE
  - 2019: 1st Place Winner at the NATIONAL LEVEL competition for "The Science Coalition's Fund It Forward Student Video Challenge". The Fund It Forward Student Video Challenge is a contest for undergraduate and graduate students currently enrolled in The Science Coalition (TSC) member institutions. Participants were asked to create a video to tell the story of why science matters and remind members of Congress that now is the time to invest in research for the future of the USA. The winner was decided by the votes of over 2,000 participants from across the country.
  - Jointly received the 1st place in Graduate category by TSC.
    https://www.sciencecoalition.org/2019/12/11/the-science-coalition-announces-winners-of-2019-fund-it-forward-student-video-challenge/
    Link to the video: https://youtu.be/YUQTSIPw6b0
  - 2020: Outstanding Graduate Oral Presentation, Midlands Society of Physiological Sciences, and Iowa Physiological Society meeting. His abstract was one of the four abstracts were selected for the "oral presentation". Among the four-oral presentation, he was winner of the "Beckman Coulter Life Sciences Outstanding Graduate Oral Presentation".
  - Other recognitions: UNMC today:
    https://www.unmc.edu/news.cfm?match=24839
    https://www.unmc.edu/news.cfm?match=26638
  - 2020: Received UNMC Program of Excellent Assistantship

- Tyler N Kambis, PhD (2018-22):
  Tyler, my first PhD student, has shown remarkable dedication and academic prowess, evidenced by his two national awards. He notably secured the UNMC Program of Excellent Assistantship and the prestigious F31 grant on his first attempts, a testament to his exceptional research capabilities. His work has been consistently recognized and honored within the academic community. Upon completing his PhD, he immediately received an offer as a Scientific and Medical Research Analyst with the Defense Health Program S & T at Knowesis Inc., showcasing his expertise and the high regard in which he is held in the scientific community.

  - 2019: Tyler garnered national acclaim by winning 1st Place in "The Science Coalition's Fund It Forward Student Video Challenge" in the Graduate Student category. This accolade was a joint effort with Sumit Kar, highlighting their exceptional collaborative skills and creativity in effectively communicating scientific concepts.
  - 2019: Received UNMC Program of Excellent Assistantship
  - 2019-22: Graduate student representative for UNMC's chapter of the Student Alliance for
  - Global Health
  - 2019-22: Executive Board Member of Coalition Rx focused on providing policy briefs and biomedical perspective
  - 2020-22: Member of UNMC Legislative Team for selection of priority state legislation.
  - 2020-22: Member of American Physiological Society Cardiovascular Section Trainee Committee
  - 2020-2021: PRESIDENT, UNMC student Delegate. Head student for State policy advocacy

- 2020: Tyler achieved second place in the prestigious Research! America 2020 Flash Talks Competition, a national event. He was among only 10 individuals selected, ranging from graduate students to young investigators. His engaging 3-minute talk, "Using the wrong fuel for the right job," drew a compelling parallel between global energy crises and the energy crisis in diabetic hearts. This forum featured renowned speakers like Dr. Sanjay Gupta from CNN, Dr. Anthony Fauci, a global health adviser, and NIH Director Dr. Francis Collins.
  https://www.researchamerica.org/news-and-events/events/national-health-research-forum
  https://www.unmc.edu/news.cfm?match=26235
- Awarded a Research! America CIVIC ENGAGEMENT MICROGRANT to facilitate dialogue between public officials, community leaders, and the public around issues of common scientific concerns.
- 2021: Awarded a Ruth L Kirschstein Predoctoral Individual National Research Service Grant, the National Institutes of Health grant F31 in July.
- 2021: Recognized as a Shepherd University FINEST UNDER 40 ALUMNI:
  https://www.shepherd.edu/suaa/alumnihighlights?fbclid=IwAR2ZYCR7R_8pGlFdVfuSZDAvLZOAd__oxcFrqfEClS1_0xGeIfpfWcVtro
- 2021: 1st Place in the Oral Presentations of Graduate Category in the 2021 Midlands Society of Physiological Sciences Scientific session.
- 2021: Recognized UNMC “GRADUATE STUDENT OF DISTINCTION” based on appointment to a standing committee of a national society- American Physiology Society, and national fellowship, NIH F31.

- Flobater I. Gawargi, PhD (2022-):
  Flobater is a standout researcher known for his rapid progression, efficiency, and quick comprehension of complex concepts. His academic record boasts numerous publications and esteemed fellowships, including the UNMC Presidential Graduate Fellowship and an AHA Predoctoral Fellowship with a notable score under 4%. He's also repeatedly honored at the Nebraska Center for the Prevention of Obesity (NPOD) with consecutive Best Poster Awards, underscoring his consistent research excellence.

  - 2022: Received the Best Poster Award in Nebraska Center for the Prevention of Obesity (NPOD) 8th Research Symposium at the University of Nebraska-Lincoln, September
  - 2022: Received 2nd Place in Graduate Poster Award in Midlands Society of Physiological Sciences Scientific Session, October
  - 2023: Received “UNMC Presidential Graduate Fellow” Award, June
  - 2023: Received “Research Innovation Award” of the University of Nebraska Medical Center, September
  - 2023: Received Best Poster Award in Nebraska Center for the Prevention of Obesity (NPOD) 9th Research Symposium at the University of Nebraska-Lincoln, September
  - 2023: Received 1st Place in Graduate Poster Award in Midlands Society of Physiological Sciences Scientific Session, October
  - 2023: Received AHA Predoctoral Fellowship (score 3.68%)
  - 2023: UNMC Dean of Graduate Studies Conference Attendence Award for AHA BCVS
  - 2024: Research Recognition Award, Amercian Physiological Society, APS Summit
  - 2024: Oral Presentation, APS Summit

POSTDOCTORAL FELLOWS

- Vishalakshi Chavali, Ph.D.
  - 2013: Finalist for the James Willerson Clinical Award Lecture, Cardiovascular Forum for Promoting Centers of Excellence and Young Investigators Conference, KY

- Shyam Sundar Nandi, Ph.D.
  - 2015: Best Poster Award in Translational Medicine, Annual Meeting of the International Academy of Cardiovascular Sciences: North American Section, NE
  - 2017: UNMC Postdoctoral Excellence in Research Award https://www.unmc.edu/news.cfm?match=21046&pk_campaign=email&pk_kwd=Dr_Nandi_receives_postdoctural_research_award
  - 2017: "Research recognition Award" from American Physiological Society Cardiovascular Section (APS, CV section), based on Experimental Biology meeting abstract and scientific achievements.
  - 2018: Caroline tum Suden/Frances Hellebrandt Professional Opportunity Award from APS, CV Section, based on Experimental Biology meeting abstract and scientific achievements

- Priyanka Prathipati, Ph.D.
  - 2015: Oral Presentation Award, Nebraska Physiological Society meeting, Omaha, NE

- Bryan T. Hackfort, Ph.D.
  - 2015: Best Poster Presentation Award, Nebraska Physiological Society meeting, Omaha, NE

- Santosh K. Yadav, Ph.D.
  - 2018: Poster Presentation Award, Nebraska Physiological Society Meeting, Omaha, NE
  - 2019: 1st Prize in Poster Presentation Award, Midlands Society of Physiological Sciences meeting, Omaha, NE
  - 2019-present: Elected, Vice President of UNMC Postdoctoral Association
  - 2020-21: Elected, Council member of the Midlands Society of Physiological Sciences.

SUMMER STUDENT

- Patrick Marta, High School Summer Trainee
  - 2017: Poster presentation Award, Nebraska Physiological Society meeting, Nebraska

- Noah Needle, BS Summer Trainee
  - 2023: Oral Presentation Award, Midlands Society of Physiological Sciences meeting, Nebraska

STAFF

- Hamid R. Shahshahan, Research Technologist
  - 2017 UNMC Chancellor's Council "Silver U Award".
  - 2020 UNMC Chancellor's Council "Gold U Award". https://www.unmc.edu/news.cfm?match=25787&pk_campaign=email&pk_kwd=Hamid_Shahshahan_is_Gold_U_recipient_for_June

3. Primary Trainee's grant

I. Cardiac iron regulation to prevent myocardial cell death in T1DM
American Heart Association Predoctoral Award (24PRE1181407)
January 1, 2024 - December 31, 2025 (relinquished in December 2024 due to completion of PhD)
Direct cost: Year/Total: 2/$67,388
PI: Flobater I. Gawargi

II. Iron homeostasis and cell death in the T1DM heart
University of Nebraska Medical Center Presidential Graduate Fellowship
July 1, 2023 - June 30, 2024 (relinquished in January 2024 due to F31 fellowship)
Direct cost: Year/Total: 2/$54,400
PI: Flobater I. Gawargi

III. Targeting metabolic remodeling and mitochondrial dysfunction in the diabetic heart
National Institutes of Health F31 Fellowship
January 2021- January 2023 (relinquished in May 2022 due to completion of PhD)
Direct cost: Year/Total: 2/$67,576
PI: Tyler N. Kambis

IV. Targeting ferroptotic death in diabetic cardiomyopathy with H_2S
UNMC Program of Excellent Assistantship for Graduate Students
July 1, 2020-June 30, 2022 (relinquished in December 2020 due to completion of PhD)
Direct cost: Year/Total: 2/$51,000
PI: Sumit Kar

V. Ameliorating mitochondrial damage by miR-133a in the T1DM heart
UNMC Program of Excellent Assistantship for Graduate Students
July 1, 2019-June 30, 2021 (relinquished in January 2021 due to F31 fellowship)
Direct cost: Year/Total: 2/$51,000
PI: Tyler N Kambis

VI. Mitochondrial abnormalities and its regulation by miRNA in diabetic hearts
American Heart Association Postdoctoral Award (16POST27260104)
July 1, 2016-June 30, 2018
Direct cost: Year/Total: 2/$82,000
PI: Shyam Sundar Nandi

D. CO-MENTOR / MENTOR OF FACULTIES AND TRAINEES

Year	Name	Project	Institution
2019-21	Song-Young Park	Mentor. Discussing individual development plan is required for researchers at the undergraduate institutions	Assistant Professor, School of Health and Kinesiology, UNO.
2020-23	Arpita Chatterjee	Co-Mentor. Radiation-induced cardiotoxicity in diabetes.	Instructor, Biochemistry and Molecular Biology, UNMC
2021-23	Andrew Hamann	Co-Mentor. miRNA in cardiomyopathy. Received AHA, Career Development Grant in 2021	Research Assistant Professor, College of Engineering, UNL
2021-24	Shuai Li	Co-Mentor. Autophagy in peripheral artery disease. Received AHA, Career Development Grant in 2021	Instructor, Surgery, UNMC
2022-24	Weilun Ai	Co-Mentor. Cardiomyopathy and cardiac dysfunction. Received AHA Predoctoral Fellowship in 2023	Graduate student, IPMM, UNMC
2023-present	Colman Freel	Co-Mentor, Role of miRNA in diabetes-associated fetal cardiovascular dysfunction	MD, PhD student, IPMM, UNMC

CO-MENTOR in GRANTS:

I. *Autophagy in peripheral artery disease: clinical relation and treatment potential*
American Heart Association Career Development Award (# 851214)
July 1, 2021-June 30, 2024
Direct Costs: Year/Total: 3/ $231,000
PI: Shui Li
Instructor, University of Nebraska Medical Center

II. *Engineering cells to produce miRNA-loaded and cardiomyocyte-targeting exosomes*
American Heart Association Career Development Award
December 1, 2021- November 30, 2024
Direct Costs: Year/Total: 3/ $300,000
PI: Andrew Hamann
Research Assistant Professor and Biomedical Engineer, University of Nebraska-Lincoln

III. *The role of thromboxane-prostanoid receptor in alcohol cardiomyopathy*
American Heart Association Predoctoral Fellowship Award (# 1019901)
January 1, 2023- December 31, 2024
Direct Costs: Year/Total: 2/ $65,106
PI: Weilun Ai
Graduate Student, University of Nebraska Medical Center

E. THESIS/DISSERTATION COMMITTEE

Chair of the Dissertation Committee

Year	Name	Thesis degree	Department, Institution
2011-12	Camille Brunson	M.S.	Physiology and Biophysics, University of Louisville
2011-12	Leiberh Noel Diaz	M.S.	Physiology and Biophysics, University of Louisville
2011-12	Jessica Harris	M.S.	Physiology and Biophysics, University of Louisville
2017-22	Tyler N. Kambis	Ph.D.	Cellular and Integrative Physiology, UNMC
2018-20	Sumit Kar	Ph.D.	Cellular and Integrative Physiology, UNMC
2022-24	Flobater I. Gawargi	Ph.D.	Cellular and Integrative Physiology, UNMC

Member of Dissertation Committee

Year	Name	Thesis degree	Institution
2011	Jonathan Vacek	*summa cum laude*	Physiology and Biophysics, University of Louisville
2011	Nicole S. Stivers	M.S	Cellular and Integrative Physiology, UNMC

2013-2015	Derek Passer Mentors: Irving H. Zucker (UNMC) and Ibrahim J. Domian (Harvard University)	Ph.D.	Cellular and Integrative Physiology, UNMC Dissertation: *Atypical Protein Kinase C dependent polarized Cell Division is required for Myocardial Trabeculation*
2014-2016	Yuan Ying (Mentor: Babu Padanilam)	Ph.D.	Cellular and Integrative Physiology, UNMC Dissertation: *The role of P53 signaling in unilateral ureteral obstruction induced Fibrogenesis*
2016-2020	Anyum Ma (Mentor: Irving H. Zucker)	Ph.D.	Cellular and Integrative Physiology, UNMC Dissertation: *The Role of central ACE2 and Nrf2 in Sympatho-excitation: Responses to Central Ang II*
2016-2020	Ahmed Wafi (Mentor: Irving H. Zucker)	Ph.D.	Cellular and Integrative Physiology, UNMC Dissertation: *Exercise and Nrf2 in Chronic heart Failure*
2017-2019	Ke Liao (Mentor: Shilpa Buch)	Ph.D.	Pharmacology and Experimental Neuroscience, UNMC Dissertation: *Role of Circular-RNA in Morphine-mediated Microglial Activation: Implication for Cognitive Impairment and Memory Loss*
2017-2023	Sydney E. Greer	Ph.D.	Genetics, Cell Biology & Anatomy, UNMC Dissertation: *Growth plate cartilage: Understanding the contribution of adhesion to column formation and matrix structure*
2018-2022	Cassandra M. Moshfegh (Mentor: Adam case)	Ph.D.	Cellular and Integrative Physiology, UNMC Dissertation: *The role of calprotectin in T-lymphocyte driven inflammation in a mouse model of psychological trauma*
2019-20	Steven Scott (Mentor: Song-Young Park)	M.S.	School of Health and Kinesiology, University of Nebraska-Omaha, NE
2020-22	Hadassha Tofilau (Mentor: Surabhi Chandra)	M.S.	Department of Biology, University of Nebraska-Kearney, NE
2020-21	TeSean Wooden (Mentor: Song-Young Park)	M.S.	School of Health and Kinesiology, University of Nebraska-Omaha, NE
2020-24	Weilun Ai (Mentor: Saraswathi Viswanathan)	Ph.D.	Internal Medicine, UNMC Dissertation: *The role of thromboxane A2 receptors in alcohol-associated liver disease and alcohol-associated cardiomyopathy*

2020-24	Corrine F. Monaco (Mentor: John Davis)	Ph.D.	OB/GYN, UNMC Dissertation: *Microenvironment of the bovine corpus luteum*
2020-	Mane Polite R (Mentor: Rebekah Gundry)	Ph.D.	Cellular and Integrative Physiology, UNMC Dissertation: *TBD*
2022-23	Megan L Otte	M.S.	Biochemistry and Molecular Biology UNMC
2022-23	Dong gun Jin	M.S.	School of Health & Kinesiology, University of Nebraska at Omaha
2022-24	Ethan E Jeal	M.S.	UNMC, Non-Thesis MS in Medical Physiology
2022-24	Jay T Reifenrath	M.S.	UNMC, Non-Thesis MS in Medical Physiology
2023-24	Seerat Balraj	M.S.	UNMC, Non-Thesis MS in Medical Physiology
2023-24	Kennedy Scheele	M.S.	UNMC, Non-Thesis MS in Medical Physiology
2024-	David Watson	M.S.	UNMC, Non-Thesis MS in Medical Physiology
2024-	Emily Miller	M.S.	UNMC, Non-Thesis MS in Medical Physiology
2024-	Madeline Soyer	M.S.	UNMC, Non-Thesis MS in Medical Physiology
2024-	Sage Dorenkemper	M.S.	UNMC, Non-Thesis MS in Medical Physiology

Chair of the Dissertation Defense

2023	Sydney E. Greer	Ph.D.	Biochemistry and Molecular Biology, UNMC

F. COMPREHENSIVE EXAMINATION COMMITTEE

Year	Student	Degree	Department
2015	Yuan Ying	Ph.D.	Cellular and Integrative Physiology, UNMC
2017	Anyum May	Ph.D.	Cellular and Integrative Physiology, UNMC
2018	Ke Liao	Ph.D.	Pharmacol & Experimental Neuroscience, UNMC
2019	Zhiqui Xia	Ph.D.	Cellular and Integrative Physiology, UNMC
2020	Sumit Kar	Ph.D.	Cellular and Integrative Physiology, UNMC
2020	Cassandra M. Moshfegh	Ph.D.	Cellular and Integrative Physiology, UNMC
2020	Tyler N. Kambis	Ph.D.	Cellular and Integrative Physiology, UNMC
2021	Upendra Chalise	Ph.D.	Cellular and Integrative Physiology, UNMC
2022	Joshua McDowell	Ph.D.	Biochemistry and Molecular Biology, UNMC
2022	Weilun Ai	Ph.D.	Internal Medicine, UNMC
2022	Molly N. Schieber	M.D./ Ph.D.	Vascular Surgery, UNMC

2022	Kajal Kamara	Ph.D.	Cellular and Integrative Physiology, UNMC

Chair of the Comprehensive Exam Committee

Year	Student	Degree	Department
2017	Ahmed Wafi	Ph.D.	Department of Cellular and Integrative Physiology, UNMC
2020	Sydney E. Greer	Ph.D.	Department of Genetics, Cell Biology, & Anatomy, UNMC
2022	Corrine F. Monaco	Ph.D.	Department of Obstetrics/Gynecology, UNMC
2023	Mane R. Mesidor	Ph.D.	Department of Cellular and Integrative Physiology, UNMC

G. ORAL QUALIFYING EXAMINATION COMMITTEE

Year	Student	Degree	Department	Title
2015	Derek Passer	Ph.D.	Cellular and Integrative Physiology, UNMC	Atypical Protein Kinase C dependent polarized cell division is required for myocardial trabeculation
2016	Yuan Ying	Ph.D.	Cellular and Integrative Physiology, UNMC	The role of P53 signaling in unilateral ureteral obstruction-induced fibrogenesis
2019	Ke Liao	Ph.D.	Pharmacol. & Expt. Neuroscience, UNMC	Role of circular-RNA in morphine-mediated microglial activation: implication for cognitive impairment
2020	Anyum Ma	Ph.D.	Cellular and Integrative Physiology, UNMC	The role of central ACE2 and Nrf2 in sympatho-excitation: responses to central Ang II
2020	Ahmed Wafi	Ph.D.	Cellular and Integrative Physiology, UNMC	Exercise and Nrf2 in chronic heart failure
2022	Cassandra M. Moshfegh	Ph.D.	Cellular and Integrative Physiology, UNMC	The role of calprotectin in T-lymphocyte driven inflammation in a mouse model of psychological trauma
2022	Tyler N. Kambis	Ph.D.	Cellular and Integrative Physiology, UNMC	Determining the role of miR-133a in diabetic heart disease
2022	Hadassha M.N. Tofilau	M.S.	Biology Department, University of Nebraska Kearney	Polyamine enzymes as potential targets for cancer therapeutics to mitigate diabetic triple negative breast cancer advancement
2023	Dong gun Jin	M.S.	School of Health & Kinesiology, University of Nebraska at Omaha	Hydrogen sulfide as a biomarker in different age groups

H. INTERNATIONAL THESIS EXAMINER

2020: Ph.D. student, Department of Biophysics, All India Institutes of Medical Sciences, New Delhi, INDIA

2022: Ph.D. student, Department of Life Sciences and Biotechnology, South Asian University, New Delhi, INDIA

IV. SERVICE

A. PROFESSIONAL AFFILIATIONS

Year	Society	Selected Roles
2013-18	Nebraska Physiological Society	Council Member
2017-	American Heart Association	Fellow of American Heart Association Council on Hypertension and Basic Cardiovascular Sciences
2014-	American Physiological Society	Fellow, Cardiovascular Section
2019	Midlands Society of Physiological Sciences	Council Member
2020	Midlands Society of Physiological Sciences	President-Elect
2022	American Physiological Society Chapter Advisor Committee	Committee member
		Membership
2009-13	American Heart Association	Council on Basic Cardiovascular Sciences
2010-	American Physiological Society	Cardiovascular Section
2014-	American Heart Association	Council on Hypertension
2016-	American Heart Association	Council on Basic Cardiovascular Sciences
2017	American Society for Pharmacology and Experimental Therapeutics	
2017	American Diabetes Association	

B. GRANT REVIEWER

INTERNATIONAL

Year	Country	Funding agency	Details
2014	United Kingdom	Diabetes UK Research Grant	Reviewed one grant proposal from the University of Oxford
2017	India	Institutes Challenge Grant	Reviewed one grant proposal from the Indian Institute of Technology, Kharagpur
2019 (February)	Saudi Arabia	Ministry of Education's Research Development Office (RDO)'s International Collaboration Grant (ICG) Program. ICG's Research Capability grant (RCG) provides funding in support of basic research within the scope of designated priority research fields for the Kingdom's R & D ecosystem.	American Association for the Advancement of Science (AAAS) worked with RDO to design peer review criteria. Reviewed 5 proposals related to Biogenomics-Inflammation.
2019 (March)	Saudi Arabia	Ministry of Education's RDO. ICG's Research Capability grant.	American Association for the Advancement of Science (AAAS) worked with RDO to design peer review criteria.

			Reviewed 7 proposals related to Biogenomics- cardiovascular disease
2020 (December)	Luxembourg, Europe	INTER EUROSTARS	The Luxemburg National Research Fund for multiannual research program Reviewed one grant proposal from the Luxembourg Institute of Health
2022 (April)	United Arab Emirates	University of Sharjah	Evaluating a faculty's project to be supported by the university

NATIONAL

NATIONAL INSTITUTES OF HEALTH (NIH)

Year	Study section name	Role
2013 (July)	Diabetes Complications Consortium, NIDDK Study Section	Mail Reviewer
2016 (Feb)	Cardiac Contractility and Heart Failure study section	Ad-hoc Member
2017 (March)	Special Emphasis Panel ZRG1 EMNR-S (02)	Ad-hoc Member
2017 (August)	Special Emphasis Panel CVRS-02	Ad-hoc Member
2017 (Oct)	NHBLI Program Project	Ad-hoc Member
2017 (Dec)	Special Emphasis Panel ZRG1 CVRS-L (80) R15 AREA	Ad-hoc Member
2018 (March)	Special Emphasis Panel ZRG1 CVRS-L (80) R15 AREA	Ad-hoc Member
2018 (April)	Special Emphasis Panel CVRS-02	Ad-hoc Member
2018 (June)	Cardiovascular SBIR/STTR ZRG1-CVRS-C-10	Ad-hoc Member
2018 (July)	Special Emphasis Panel ZRG1 CVRS S (80) R15	Ad-hoc Member
2018 (Oct)	Special Emphasis Panel ZRG1 CVRS C (02)	Ad-hoc Member
2018 (Nov)	Cardiovascular SBIR/STTR ZRG1-CVRS-C-10	Ad-hoc Member
2018 (Dec)	DP5 ZRG1 PSE-H 70	Ad-hoc Member
2019 (March)	Special Emphasis Panel ZRG1 CVRS-K (80) R15	Ad-hoc Member
2019 (Nov)	Cardiovascular SBIR/STTR ZRG1-CVRS-C-10	Ad-hoc Member
2020 (June)	MIM study section	Ad-hoc Member
2021 (March)	NRSA Fellowship F10A-K	Ad-hoc Member
2021 (July)	Fellowship F10A-K	Ad-hoc Member
2021 (Nov)	Cardiovascular Science SBIR ZRG VH-N (11)	Ad-hoc Member
2022 (March)	Physiology and Pathobiology of Cardiovascular and Respiratory Systems Fellowship ZRG1 F10A-K 20	Ad-hoc Member
2022 (June)	Therapeutic Development and Preclinical Studies (TDPS)	Ad-hoc Member
2022 (July)	Fellowship F10A-K 20	Ad-hoc Member
2023 (June)	Therapeutic Development and Preclinical Studies (TDPS)	Ad-hoc Member
2024 (March)	Physiology and Pathobiology of Cardiovascular and Respiratory Systems Fellowship ZRG1 F10A-K 20	Ad-hoc Member
2025 (April)	Special Emphasis Panel SBIR ZHL1 CSR-R (M1) 2	Ad-hoc Member

DEPARTMENT OF VETERANS AFFAIRS (VA)

Year	Study section name	Role
2019 (May)	ZRD1 CARA-R 01 1. Cardiovascular Studies	Ad-hoc Member

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

Year	Study section name	Role
2019 (January)	BION-M2	Ad-hoc Member
2019 (May)	Musculoskeletal-Cardiovascular ROSBio	Ad-hoc Member
2020 (May)	ROSBio 2020 Flight and Ground	Ad-hoc Member
2021 (June)	ROSES Program Element E.12	Ad-hoc Member

AMERICAN HEART ASSOCIATION (AHA)

Year	Study section name	Role
2011	Basic Cell Genetics and Epigenetics	Member
2012	Basic Cell Genetics and Epigenetics	Member
2014 (Sept)	Basic Cell Genetics and Epigenetics	Member
2014 (Oct)	Clinical, Behavioral Science	Ad-hoc Member
2015 (Oct)	Innovative Research Grant, Basic Sciences 1	Ad-hoc Member
2016 (Oct)	Basic Cell Genetics and Epigenetics	Member
2023 (April)	Second Century Early Faculty Independence Award	Ad-hoc Member

UNIVERSITY

Year	University name	Study section name and application
2016	University of Nebraska Medical Center	Genetics, Graduate Fellowship applications
2017	Cleveland Clinic	Lerner College of Medicine, Ohio Cancer Research grant application
2017	University of Nebraska Medical Center	Cell Biology-II, Pre-doctoral fellowship application
2017	University of Florida	College of Pharmacy, Research grant application
2017	Indiana University	Indiana Alzheimer Disease Center, Indiana University of Medicine grant application
2018	University of Nebraska Medical Center	Drug Development, Pre-doctoral fellowship application

C. EDITORIAL BOARD OF JOURNAL

Year	Journal	Activity
2021-	*American Journal of Physiology- Heart and Circulatory Physiology*	Consulting Editor
2021	*Frontiers in Cell and Developmental Biology* Section: Cell Death and Survival	Guest Editor
2018-	*Frontiers in Integrative Physiology*	Associate Editor
2018	*Oxidative medicine and Cellular Longevity* Special issue: mTOR Signaling in Cardiometabolic Disease, Cancer, and Aging	Guest Editor
2017	*Frontiers in Cardiovascular Medicine* Special issue: The Non-coding Genome and Cardiovascular Disease	Guest Editor
2015-20	*American Journal of Physiology- Heart and Circulatory Physiology*	Editorial Board
2011-21	*International Journal of Physiology, Pathophysiology and Pharmacology*	Associate Editor

D. REVIEWER OF JOURNAL

	Year	Journal	Ad-hoc Activity
1.	2013-	*AJP- Heart and Circulatory Physiology*	Reviewer
2.	2014-	*AJP- Regulatory, Integrative and Comparative Physiology*	Reviewer
3.	2022-	*Atherosclerosis, Thrombosis, and Vascular Biology*	Reviewer
4.	2014-	*BBA- Molecular Basic of Disease*	Reviewer
5.	2014-	*BioMed Research International*	Reviewer
6.	2014-	*Canadian Journal of Physiology & Pharmacology*	Reviewer
7.	2014-	*Cardiovascular Diabetology*	Reviewer
8.	2014-	*Cardiovascular Research*	Reviewer
9.	2014-	*Cell Biochemistry and Biophysics*	Reviewer
10.	2014-	*Cell Death and Disease*	Reviewer
11.	2014-	*Circulation*	Reviewer
12.	2014-	*Comparative Biochemistry and Physiology*	Reviewer
13.	2014-	*Current Diabetes Review*	Reviewer
14.	2014-	*Diabetes Research and Clinical Practice*	Reviewer
15.	2014-	*European Journal of Heart Failure*	Reviewer
16.	2014-	*Food and Chemical Toxicity*	Reviewer
17.	2014-	*Genome*	Reviewer
18.	2014-	*International Journal of Biology*	Reviewer
19.	2014-	*International Journal of Molecular Medicine*	Reviewer
20.	2023	*JCI Insight*	Reviewer
21.	2014-	*Journal of Cellular and Molecular Medicine*	Reviewer
22.	2014-	*Journal of Cardiovascular Translational Research*	Reviewer
23.	2014-	*Journal of Molecular and Cellular Cardiology*	Reviewer
24.	2014-	*Journal of Stem Cell Research and Therapy*	Reviewer
25.	2014-	*Life Sciences*	Reviewer
26.	2014-	*Molecular and Cellular Biochemistry*	Reviewer
27.	2014-	*Molecular Biology Reports*	Reviewer
28.	2023-	*Nature Communication*	Reviewer
29.	2014-	*Neurochemistry International*	Reviewer
30.	2014-	*Oxidative Medicine and Cellular Longevity*	Reviewer
31.	2014-	*PLOS One*	Reviewer
32.	2014-	*Recent Patents on Biotechnology*	Reviewer
33.	2014-	*Reproductive Sciences*	Reviewer
34.	2016-	*Scientific reports*	Reviewer
35.	2020-	*Theranostics*	Reviewer
36.	2014-	*Toxicological Sciences*	Reviewer
37.	2014-	*Tissue Engineering*	Reviewer

E. BOOK REVIEWER

Year	Publisher	Book title	Editor(s)
2018	Elsevier	MicroRNA in Regenerative Medicine	Chandan K. Sen
2021	Elsevier	Cellular, Molecular and Environmental Contribution in Cardiac Remodeling: from preclinical to clinical perspective	Rahul Mallick and Asim K. Duttaroy

F. SCIENTIFIC JUDGE

Year	Meeting	Role
2009-12	Research Louisville Forum, University of Louisville, Louisville, KY	Poster Judge
2011	Third Annual Graduate Research Symposium at University of Louisville, Louisville, KY	Poster Judge
2014-18	Nebraska Physiological Society, Omaha, NE	Poster Judge
2015-17,19	Midwest Student Biomedical Research Forum, Omaha, NE	Poster Judge
2015	Annual meeting of the international academy of cardiovascular sciences (IACS): North American section, September 10-12, Omaha, NE	Abstract Judge for four award categories
2016	American Physician Scientists Association Midwest Regional Meeting	Poster Judge
2018	Nebraska Physiological Society, Omaha, NE	Abstract Judge for oral presentation
2018	Annual Research Symposium, Department of Biochemistry and Molecular Biology, UNMC, Omaha, NE	Poster Judge
2020-21	GCBA/MGCB/BISB Student Research Forum, UNMC, Omaha, NE	Poster Judge
2020	Midlands Society of Physiological Sciences	Presentation Judge
2020	College of Medicine Retreat, UNMC, Omaha, NE	Poster Judge
2020-21	Nebraska Junior Academy Sciences Physiology Award, Research program, Omaha, NE	Presentation Judge
2022	Nebraska Center for the Prevention of Obesity Disease (NPOD) 8th Research Symposium, Lincoln, NE	Poster Judge
2022	Midlands Society of Physiological Sciences	Abstract Judge for oral presentation
2022	Midlands Society of Physiological Sciences	Poster Judge
2023	Midlands Society of Physiological Sciences	Abstract Judge for oral presentation
2024	Midlands Society of Physiological Sciences	Poster Judge

G. COMMITTEE MEMBER

NATIONAL

Year	Committee	Member
2015-18	American Physiological Society	Member, Fellowship Committee of Cardiovascular Section
2019-22	American Physiological Society	Member, Awards Committee of Cardiovascular Section
2022-23	American Physiological Society	APS Chapter Advisory Committee

UNIVERSITY

Year	Committee	Member
2014-	Mouse Genome Engineering Core Advisory Committee	Member
2015- 2021	Research and Development Committee	Member

DEPARTMENT

Year	Committee	Member
2014-20	Alice Cumming Award Committee	Member
2014-15	Faculty Recruitment Committee, Department of Physiology	Member
2014- June 2020	Review Committee, A Ross McIntyre Cardio-Renal Seminar	Member
2020-March 2021	Faculty Recruitment Committee, Department of Physiology	Member
2020- 21	MGCB Graduate Program Committee	Member
2020-	IPMM Graduate Program Committee	Member

H. COMMUNITY ACTIVITY

2005-: Colleague promotion and tenure letters: >15 evaluation recommendation letters given

2002-: Other letters of support (e.g., grant or permanent resident applications): >20 letters given

2010: 4 weeks volunteer at the University of Louisville Hospital, Louisville, KY

2010: Donated blood at the American Red Cross Blood Camp, Louisville, KY

2018: Donated blood at the American Red Cross Blood Camp, Omaha, NE

2022: Recommendation letters for immigration, promotion, and grant: >30

2022: Contributed an article titled “Diabetes is Linked to Heart Disease” Research News in the July Newsletter of UNMC Olson Center Women’s Health Overview