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SIHEM BOUDINA

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EDUCATION

PhD University of Bordeaux 2, Bordeaux, France, 2002, Biological Sciences
Dissertation: Energetic Coupling in the Ischemic Heart.
Mentor: Dr. Pierre Dos Santos.

MS University of Bordeaux 2, Bordeaux, France, 1998, Neuroscience and Neuropharmacology.

BS University of Science and Technology, Algiers, Algeria, 1997, Animal Physiology.

EMPLOYMENT

Faculty Positions:

Research Assistant Professor 04/01/2008 -03/31/2010
Department of Internal Medicine, Division of Endocrinology, University of Utah.

Assistant Professor 01/04/2010 -06/30/2016
Department of Internal Medicine, Division of Endocrinology, University of Utah.

Assistant Professor 07/01/2016-06/30/2017
Department of Nutrition and Integrative Physiology, College of Health, University of Utah.

Associate Professor (with Tenure) 07/01/2017-06/30/2023
Department of Nutrition and Integrative Physiology, College of Health, University of Utah.

Full Professor 07/01/223-Present
Department of Nutrition and Integrative Physiology, College of Health, University of Utah.

Post-Doctoral Training:

Post-doctoral fellow 05/02/2002-03/31/2006
Department of Internal Medicine, Division of Endocrinology, University of Utah
Mentor: Dr. E. Dale Abel.

Other Positions:

Director of the Metabolic Phenotyping Core Facility 2013-2016
University of Utah.

Associate Director of the Metabolic Phenotyping Core Facility 2011-2013
University of Utah.

HONORS AND AWARDS

Algeria-France Exchange Scholarship 1997—2001
Ministry of Higher Education, Algeria

GRRC Research Fellowship 2001
Groupe de Réflexion pour la Recherche Cardiovasculaire (GRRC), France.

FRM Research Fellowship 2002
La Fondation pour la Recherche Médicale (FRM) Fellowship, France.

Trainee Travel Award 2003
The American Heart Association Scientific Session, Orlando.

Postdoctoral Fellowship 2004-2006
Juvenile Diabetes Foundation (JDRF)

Trainee Travel Award 2006
The American Heart Association Scientific Session, Chicago.

Postdoctoral Fellowship Award 2006-2008
The American Heart Association (AHA) – Western Affiliates

College of Health top researcher honoree, University of Utah 2016

New Investigator Award, College of Health, University of Utah 2017

SERVICE

University of Utah Women's Leadership Committee Member 2022-Present

College of Health Council Chair	2021-Present
University of Utah MD/PhD Admission Committee Chair	2021-Present
University of Utah Diabetes Metabolism Research Center (DMRC) Steering Committee Member	2020- 2023
University of Utah MD/PhD Admission Committee Member	2020-2021
University of Utah Bioscience PhD Program Steering Committee Member	2020-Present
NUIP Graduate Admission Committee	2017-2023
College of health Research Committee Member	2020-2022
College of Health Equity, Diversity and Inclusion Committee Member	2017-2020
University of Utah Medical School Admission Committee Member	2013-2016
Co-founder/ Participant, Metabolism Interest Group (MIG)	2009 -2013

GRANT REVIEW COMMITTEES/STUDY SECTIONS

Chair, Integrative Myocardial Physiology/Pathophysiology A (MPPA) NIH study section (2023-Present).

Ad-hoc reviewer, American Heart Association (AHA) Innovative Project Award (IPA), (2023).

Ad-hoc reviewer, American Heart Association (AHA) Transformational Project Award (TPA) Basic Cardiac Science 2 (2022).

Reviewer, Austrian Science Fund (2022).

Standing member, Integrative Myocardial Physiology/Pathophysiology A (MPPA) NIH study section (2021-2023).

Ad-hoc member, Canada Foundation for Innovation (2020).

Ad-hoc reviewer, American Heart Association (AHA) Transformational Project Award (TPA) Basic Cardiac Science 2 (2020).
Ad-hoc member, Cardiac Contractility, Hypertrophy, and Failure (CCHF) study section (2019-2021).

Ad-hoc reviewer, European Research Council (ERC), (2019).

Ad-hoc member, Integrative Physiology of Obesity and Diabetes (IPOD) NIH study section (2019).

Ad-hoc reviewer, National Institute of General Medical Sciences RM1 grants (2018).

Ad-hoc reviewer, National Institute of Aging Scientific Review Group P01 (2018).

The American Association for the Advancement of Science (AAAS) Research Competitiveness Program (2017-2018).

Ad-hoc reviewer Diabetes UK (2016).

Ad-hoc Reviewer, Cellular Aspects of Diabetes and Obesity (CADO) NIH study section (2013-2021).

Grant Reviewer, Barth Syndrome Foundation (2014).

SYMPOSIUM/INVITED SPEAKER/MEETING CHAIR/COORDINATOR/MODERATOR

2023, Session Moderator, American Heart Association Scientific Session, Philadelphia. Session Title: To Inhibit or Not to Inhibit SGLT2? Preclinical and Clinical Insights into HFrEF and HFpEF.

2023, Guest Speaker, Vascular Biology Center (VBC), Augusta University, Augusta. Talk title: ***Metabolic Regulation in Congenital Cardiomyopathies***.

2023, Guest Speaker, Pioneers in Biomedical Research Series, Fralin Biomedical Research Institute (FBRI), Virginia Tech University, Virginia. Talk title: ***Novel Regulators of Cardiac Maturation***.

2022, Guest Speaker, Cardiovascular Seminar Series, Albert Einstein College of Medicine. Talk title: ***Autophagy and Cardiovascular Health***.

2022, Guest Speaker, Center for Metabolic Disease Center, Temple University. Talk title: **The Multifaceted Role of Autophagy in Cardiovascular Disease**.

2022-2023, Session Co-Chair, 10th and 11th Utah Cardiac Recovery Symposium.

2020, Guest Speaker, Victor J. Dzau Seminar Series, Duke Cardiovascular Research Center. Talk title: **Metabolic Dysregulation in Acquired and Inherited Cardiomyopathies**.

2019, Session Moderator, American Heart Association Scientific Session, Philadelphia. Session title: Metabolism: PSSST It's Not Just About ATP.

2018, Invited Speaker, II Workshop on Inflammation, Rio de Janeiro, Brazil Session title: Metabolism. Talk title: **Redox-Regulation of Thermogenesis and Metabolism**.

2018, Guest Speaker, Medical College of Georgia, Department of Physiology Research Seminar, Augusta University. Talk title: **Adipocytes ROS and Metabolic Regulation: Friend or a Foe?**

2018, Invited Speaker, NHLBI Unlocking the secrets of Mitochondria: Path to a Cure in Heart Failure Workshop, Bethesda, Talk title: **Mitochondrial Dysfunction in the Diabetic Heart**.

2017, Invited Speaker, British Cardiovascular Society (BCS) Annual Conference, Manchester, UK, Session title: Diabetes and cardiovascular disease. Talk title: **Oxidative stress and diabetic cardiovascular complications**.

2017, Symposium Session Organizer and Chair, Advancing Chicanos/Hispanic and Native Americans in Science (SACNAS) National Conference, Salt Lake City, Utah, Session Title: Mitochondrial Adaptations to Stress.

2017, Guest Speaker, Department of Biochemistry & Redox Biology Center Research Seminar, University of Nebraska, Lincoln. Talk title: **Mitochondrial Stress: A Novel Thermogenic Pathway to Fight Obesity and Diabetes.**

2017, Invited Speaker, Basic Cardiovascular Sciences Scientific Session, Portland, Oregon, Session title: Cardiac Metabolism. Talk title: **Insulin Resistance, Obesity and Cardiac Autophagy: The Role of Insulin/IGF-1 Receptor Signaling.**

2015, Guest Speaker, Department of Molecular Medicine Research Seminar, University of South Florida. Talk title: **Mitochondrial dysfunction in obesity and diabetes**.

2015, Session Chair, Session title: Metabolism Under Stress in Heart Disease and Diabetes, Keystone Mitochondria, Metabolism, Heart Failure (J5), Santa Fe Community Convention Center, Santa Fe, New Mexico, USA

2015, Guest Speaker, East Carolina University Diabetes and Obesity Institute Research meeting. Talk title: **Mitochondrial dysfunction in obesity and diabetes**.

2010, Guest Speaker, Seattle Children Research Meeting. talk title: **Is insulin resistance bad or good for your heart?**

FUNDING

Current Grants

07/15/2020 - 05/31/2024
THE ROLE OF PRDM16 IN CARDIAC DEVELOPMENT AND CARDIOMYOPATHY
Role: Principal Investigator
Direct Costs: $564,688 Total Costs: $2,258,752
National Heart, Lung and Blood Institute (NHLBI)R01

08/01/2021 - 07/31/2026
SMALL MOLECULE ANTAGONISTS TARGETING EPHB RECEPTOPRS FOR THE TREATMENT OF NON_ALCOHOLIC STEATOHEPATITIS
Role: Co-Principal Investigator
Direct Costs: $365,147 Total Costs: $1,825,735
National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)R01

04/01/2021 - 03/31/2026
AUTOPHAGY AND ARTERIOVENUS FISTULA MATURATION
Role: Co-Investigator (Subcontract)
Direct Costs: $485,317 Total Costs:
National Heart, Lung and Blood Institute (NHLBI)R01

02/01/2019 - 11/30/2023
MITOCHONDRIAL FUDSION PROTEIN MFN2 PREVENTS PLATELET DEATH AND DYSFUNCTION
Role: Co-Investigator
Direct Costs: $250,000 Total Costs: $1,000,000
National Heart, Lung and Blood Institute (NHLBI) R01

Pending Grants

12/01/2023 – 11/30/2028
PATHOBIOLOGICAL MECHANISMS OF CARDIAC DISEASE IN PGM1-CDG

Role: Co-Principal Investigator
Direct Costs: $1,952012 Total Costs: $3,812,885
National Heart, Lung and Blood Institute (NHLBI)
(Received a 12%)

Past Grants

07/01/18 -05/31/22
AUTOPHAGY MAINTAINS VASCULAR FUNCTION THROUGH A NOVEL GLYCOLYSIS LINKED PATHWAY
Role: Co-Investigator
Direct Costs: $300,571 Total Costs: $1,502,855
National Heart, Lung and Blood Institute (NHLBI) R01

04/01/20 -09/30/21
ESTABLISHING THE FUNCTION OF NOVEL HUMAN GENETIC MUTATIONS IN PRDM16 USING PATIENT-DERIVED iPSC-CMs
Role: Principal Investigator
Direct Costs: $30,000 Total Costs: $30,000
National Center for Advancing Translational Sciences (NCATS)
CCTS Pilot grant

05/01/19 -12/31/19
BROWN ADIPOSE TISSUE STEM CELL
Role: Principal Investigator
Direct Costs: $21,978 Total Costs: $30,000
Bio-Restorative Therapies, Inc.
Contract

09/01/16 -08/31/19
MNSOD IN MATURE ADIPOCYTES
Role: Principal Investigator
Direct Costs: $435,000 Total Costs: $648,150
National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) R01

07/01/16 -06/30/19
POST-DEVELOPMENTAL ADIPOCYTE AUTOPHAGY
Role: Co-Principal Investigator
Direct Costs: $217,500 Total Costs: $324,075
National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)R01

07/01/09 -06/30/13
MECHANISMS BY WHICH ROS REGULATE ADIPOGENESIS AND FAT EX
Role: Principal Investigator

Direct Costs: $323,862.56 Total Costs: $323,862.56
American Heart Association Western Affiliates
Scientist Development Grant (SDG)

PEER REVIEWED PUBLICATIONS

1) Bo Sun, Omid M.T. Rouzbehani, Ryan J. Kramer, Rajeshwary Ghosh, Robin M. Perelli, Sage Atkins, Amir Nima Fatahian, Kathryn Davis, Marta W. Szulik, Michael A. Goodman, Marissa A. Hathaway, Ellenor Chi, Tarah A. Word, Hari Tunuguntla, Susan W. Denfield, Xander H. T. Wehrens, Kevin J. Whitehead, Hala Y. Abdelnasser, Junco S. Warren, Mingfu Wu, Sarah Franklin, Sihem Boudina* and Andrew P. Landstrom*. Circulation Heart Failure (Accepted). * *Co-Corresponding authors*

2) Ryan J. Kramer, Amir Nima Fatahian, Alice Chan, Jeffery Mortenson, Jennifer Osher, Bo Sun, Lauren E. Parker, Michael B. Rosamilia, Kyra B. Potter, Kaila Moore, Sage L. Atkins, Jill A. Rosenfeld, Alona Birjiniuk, Edward Jones, Taylor S. Howard, Jeffrey J. Kim, Daryl A. Scott, Seema Lalani, MD, Omid M.T. Rouzbehani, Samantha Kaplan, Marissa A. Hathaway, Jennifer L. Cohen, S. Yukiko Asaki, Hugo R. Martinez, Sihem Boudina* and Andrew P. Landstrom*. Circ Genom Precis Med 2023 Aug;16(4):390-400. doi: 10.1161/CIRCGEN.122.003912. Epub 2023 Jul 3. * *Co-Corresponding authors*

3) Jacob D. Garritson, Jiabi Zhang, Alan Achenbach, Maroua Ferhat, Emile Eich, Chris J. Stubben, Paige L. Martinez, Anna R. Ibele, Keren I. Hilgendorf & **Sihem Boudina**. BMPER is a marker of adipose progenitors and adipocytes and a positive modulator of adipogenesis. Commun Biol 2023 Jun 13;6(1):638. doi: 10.1038/s42003-023-05011-w.

4) Marta W. Szulik, Steven Valdez, Maureen Walsh, Kathryn Davis, Ryan Bia, Emilee Horiuchi, Sean O'Very, Anil K. Laxman, Linda Sandaklie-Nicolova, David R. Eberhardt, Jessica R. Durrant, Hanin Sheikh, Samuel Hickenlooper, Magnus Creed, Cameron Brady, Mickey Miller, Li Wang, June Garcia-Llana, Christopher Tracy, Stavros G. Drakos, Katsuhiko Funai, Dipayan Chaudhuri, **Sihem Boudina**, Sarah Franklin. SMYD1a protects the heart from ischemic injury by regulating OPA1-mediated cristae remodeling and supercomplex formation. Basic Research in Cardiology (2023) 118:20.

5) Eshima H, Shahtout JL, Siripoksup P, Pearson MJ, Mahmassani ZS, Ferrara PJ, Lyons AW, Maschek JA, Peterlin AD, Verkerke ARP, Johnson JM, Salcedo A, Petrocelli JJ, Miranda ER, Anderson EJ, **Boudina S**, Ran Q, Cox

JE, Drummond MJ, Funai K (2023). Lipid hydroperoxides promote sarcopenia through carbonyl stress. Elife. Mar 23;12:e85289. doi: 10.7554/eLife.85289. Online ahead of print. doi: 10.1007/s00395-023-00991-6.

6) Werbner B, Tavakoli-Rouzbehani OM, Fatahian AN, **Boudina S** (2023). The dynamic interplay between cardiac mitochondrial health and myocardial structural remodeling in metabolic heart disease, aging, and heart failure. J Cardiovasc Aging. 2023 Jan;3(1):9. doi: 10.20517/jca.2022.42. Epub 2023 Jan 3.

7) Balakrishnan B, Altassan R, Budhraja R, Liou W, Lupo A, Bryant S, Mankouski A, Radenkovic S, Preston GJ, Pandey A, **Boudina S**, Kozicz T, Morava-Kozicz E, Lai K (2023). AAV-based gene therapy prevents and halts the progression of dilated cardiomyopathy in a mouse model of phosphoglucomutase 1 deficiency (PGM1-CDG). Transl Res. Jan 26:S1931-5244(23)00004-X. doi: 10.1016/j.trsl.2023.01.004. Online ahead of print.

8) Cho JM, Park SK, Kwon OS, Taylor La Salle D, Cerbie J, Fermoyle CC, Morgan D, Nelson A, Bledsoe A, Bharath LP, Tandar M, Kunapuli SP, Richardson RS, Anandh Babu PV, Mookherjee S, Kishore BK, Wang F, Yang T, **Boudina S**, Trinity JD, Symons JD (2023) Activating P2Y1 receptors improves function in arteries with repressed autophagy. Cardiovasc Res. Mar 17;119(1):252-267. doi: 10.1093/cvr/cvac061.

9) Cho JM, Ghosh R, Mookherjee S, **Boudina S**, Symons JD (2022). Reduce, Reuse, Recycle, Run ! : 4 Rs to improve cardiac health in advanced age. Aging (Albany NY). Dec 1;14(23):9388-9392. doi: 10.18632/aging.204415. Epub 2022 Dec 1. Review.

10) Ghosh R, Gillaspie JJ, Campbell KS, Symons JD, **Boudina S**, Pattison JS (2022). Chaperone-mediated autophagy protects cardiomyocytes against hypoxic-cell death. Am J Physiol Cell Physiol. Nov 1;323(5):C1555-C1575. doi: 10.1152/ajpcell.00369.2021. Epub 2022 May 18. PMID: 35584327

11) Garritson JD, **Boudina S** (2021).T he Effects of Exercise on White and Brown Adipose Tissue Cellularity, Metabolic Activity and Remodeling. Front Physiol. Nov 2;12:772894. doi: 10.3389/fphys.2021.772894. eCollection 2021. Review.

12) Cho JM, Park SK, Ghosh R, Ly K, Ramous C, Thompson L, Hansen M, Mattera MSLC, Pires KM, Ferhat M, Mookherjee S, Whitehead KJ, Carter K, Buffolo M, **Boudina S***, Symons JD* (2021). Late-in-life treadmill training rejuvenates autophagy, protein aggregate clearance, and function in

mouse hearts. Aging Cell. Oct;20(10):e13467. doi: 10.1111/acel.13467. Epub 2021 Sep 23. * *Co-Corresponding authors*

13) Ghosh R, Vinod V, Symons JD, **Boudina S** (2020). Protein and Mitochondria Quality Control Mechanisms and Cardiac Aging. Cells, 9(4).

14) Buffolo M, Pires KM, Ferhat M, Ilkun O, Makaju A, Achenbach A, Bowman F, Atkinson DL, Holland WL, Amri EZ, Chaurasia B, Franklin S, **Boudina S** (2019). Identification of a Paracrine Signaling Mechanism Linking CD34high Progenitors to the Regulation of Visceral Fat Expansion and Remodeling. Cell Rep, 29(2), 270-282.e5.

15) Tian R, Colucci WS, Arany Z, Bachschmid MM, Ballinger SW, **Boudina S**, Bruce JE, Busija DW, Dikalov S, Dorn GW II, Galis ZS, Gottlieb RA, Kelly DP, Kitsis RN, Kohr MJ, Levy D, Lewandowski ED, McClung JM, Mochly-Rosen D, O'Brien KD, O'Rourke B, Park JY, Ping P, Sack MN, Sheu SS, Shi Y, Shiva S, Wallace DC, Weiss RG, Vernon HJ, Wong R, Schwartz Longacre L (2019). Unlocking the Secrets of Mitochondria in the Cardiovascular System: Path to a Cure in Heart Failure—A Report from the 2018 National Heart, Lung, and Blood Institute Workshop. Circulation, 140(14), 1205-1216.

16) Heden TD, Johnson JM, Ferrara PJ, Eshima H, Verkerke ARP, Wentzler EJ, Siripoksup P, Narowski TM, Coleman CB, Lin CT, Ryan TE, Reidy PT, de Castro Brás LE, Karner CM, Burant CF, Maschek JA, Cox JE, Mashek DG, Kardon G, **Boudina S**, Zeczycki TN, Rutter J, Shaikh SR, Vance JE, Drummond MJ, Neufer PD, Funai K (2019). Mitochondrial PE potentiates respiratory enzymes to amplify skeletal muscle aerobic capacity. Sci Adv, 5(9), eaax8352

17) Ferhat M, Funai K, **Boudina S** (2018). Autophagy in Adipose Tissue Physiology and Pathophysiology. Antioxid Redox Signal, 31(6), 487-501.

18) Pires KM, Torres NS, Buffolo M, Gunville R, Schaaf C, Davis K, Selzman CH, Gottlieb RA, **Boudina S** (2019). Suppression of Cardiac Autophagy by Hyperinsulinemia in Insulin Receptor-Deficient Hearts Is Mediated by Insulin-Like Growth Factor Receptor Signaling. Antioxid Redox Signal, 31(6), 444-457.

19) Petersen C, Bell R, Klag KA, Lee SH, Soto R, Ghazaryan A, Buhrke K, Ekiz HA, Ost KS, **Boudina S**, O'Connell RM, Cox JE, Villanueva CJ, Stephens WZ, Round JL (2019). T cell-mediated regulation of the microbiota protects against obesity. Science, 365(6451).

20) de Paula GSM, Wilieman M, Silva KR, Baptista LS, **Boudina S**, de Souza LL, Bento-Bernardes T, Asensi KD, Goldenberg RCDS, Pazos-Moura CC (2019). Neuromedin B receptor disruption impairs adipogenesis in mice and 3T3-L1 cells. J Mol Endocrinol, 63(1), 93-102.

21) Runtsch MC, Nelson MC, Lee SH, Voth W, Alexander M, Hu R, Wallace J, Petersen C, Panic V, Villanueva CJ, Evason KJ, Bauer KM, Mosbruger T, **Boudina S**, Bronner M, Round JL, Drummond MJ, O'Connell RM (2019). Anti-inflammatory microRNA-146a protects mice from diet-induced metabolic disease. PLoS Genet, 15(2), e1007970.

22) Park SK, La Salle DT, Cerbie J, Cho JM, Bledsoe A, Nelson A, Morgan DE, Richardson RS, Shiu YT, **Boudina S**, Trinity JD, Symons JD (2019). Elevated arterial shear rate increases indexes of endothelial cell autophagy and nitric oxide synthase activation in humans. Am J Physiol Heart Circ Physiol, 316(1), H106-H112.

23) Cai J, Pires KM, Ferhat M, Chaurasia B, Buffolo MA, Smalling R, Sargsyan A, Atkinson DL, Summers SA, Graham TE, **Boudina S** (2018). Autophagy Ablation in Adipocytes Induces Insulin Resistance and Reveals Roles for Lipid Peroxide and Nrf2 Signaling in Adipose-Liver Crosstalk. Cell Rep, 25(7), 1708-1717.e5.

24) Warren JS, Tracy CM, Miller MR, Makaju A, Szulik MW, Oka SI, Yuzyuk TN, Cox JE, Kumar A, Lozier BK, Wang L, Llana JG, Sabry AD, Cawley KM, Barton DW, Han YH, **Boudina S**, Fiehn O, Tucker HO, Zaitsev AV, Franklin S (2018). Histone methyltransferase Smyd1 regulates mitochondrial energetics in the heart. Proc Natl Acad Sci U S A, 115(33), E7871-E7880.

25) Pires KM, Buffolo M, Schaaf C, David Symons J, Cox J, Abel ED, Selzman CH, **Boudina S** (2017). Activation of IGF-1 receptors and Akt signaling by systemic hyperinsulinemia contributes to cardiac hypertrophy but does not regulate cardiac autophagy in obese diabetic mice. J Mol Cell Cardiol, 113, 39-50.

26) Bharath LP, Cho JM, Park SK, Ruan T, Li Y, Mueller R, Bean T, Reese V, Richardson RS, Cai J, Sargsyan A, Pires K, Anandh Babu PV, **Boudina S**, Graham TE, Symons JD (2017). Endothelial Cell Autophagy Maintains Shear Stress-Induced Nitric Oxide Generation via Glycolysis-Dependent Purinergic Signaling to Endothelial Nitric Oxide Synthase. Arterioscler Thromb Vasc Biol, 37(9), 1646-1656.

27) Ortega SP, Chouchani ET, **Boudina S** (2017). Stress turns on the heat: Regulation of mitochondrial biogenesis and UCP1 by ROS in adipocytes. Adipocyte, 6(1), 56-61.

28) Han YH, Buffolo M, Pires KM, Pei S, Scherer PE, **Boudina S** (2016). Adipocyte- Specific Deletion of Manganese Superoxide Dismutase Protects from Diet Induced Obesity Through Increased Mitochondrial Uncoupling and Biogenesis. Diabetes, 65(9), 2639-51.

29) Park H, Cho S, Han YH, Janat-Amsbury MM, **Boudina S**, Bae YH (2015). Combinatorial gene construct and non-viral delivery for anti-obesity in diet induced obese mice. J Control Release, 207, 154-62.

30) **Boudina S**, Graham TE (2014). Mitochondrial function/dysfunction in white adipose tissue. Exp Physiol, 99(9), 1168-78.

31) Silva FJ, Holt DJ, Vargas V, Yockman J, **Boudina S**, Atkinson D, Grainger DW, Revelo MP, Sherman W, Bull DA, Patel AN (2014). Metabolically active human brown adipose tissue derived stem cells. Stem Cells, 32(2), 572-81.

32) Pires KM, Ilkun O, Valente M, **Boudina S** (2014). Treatment with a SOD mimetic reduces visceral adiposity, adipocyte death, and adipose tissue inflammation in high fat fed mice. Obesity (Silver Spring), 22(1), 178-87.

33) Fullmer TM, Pei S, Zhu Y, Sloan C, Manzanares R, Henrie B, Pires KM, Cox JE, Abel ED, **Boudina S** (2013). Insulin suppresses ischemic preconditioning-mediated cardioprotection through Akt-dependent mechanisms. J Mol Cell Cardiol, 64, 20-9.

34) Dodson MV, **Boudina S**, Albrecht E, Bucci L, Culver MF, Wei S, Bergen WG, Amaral AJ, Moustaid-Moussa N, Poulos S, Hausman GJ (2013). A long journey to effective obesity treatments: is there light at the end of the tunnel? [Review]. Exp Biol Med (Maywood), 238, (5), 491-501.

35) Ilkun O, **Boudina S** (2013). Cardiac dysfunction and oxidative stress in the metabolic syndrome: an update on antioxidant therapies. Curr Pharm Des, 19(27), 4806-17.

36) **Boudina S** (2013). Cardiac aging and insulin resistance: could insulin/insulin-like growth factor (IGF) signaling be used as a therapeutic target? Curr Pharm Des, 19(32), 5684-94.

37) **Boudina S**, Han YH, Pei S, Tidwell TJ, Henrie B, Tuinei J, Olsen C, Sena S, Abel ED (2012). UCP3 regulates cardiac efficiency and mitochondrial

coupling in high fat-fed mice but not in leptin-deficient mice. Diabetes, 61(12), 3260-9.

38) Bricker DK, Taylor EB, Schell JC, Orsak T, Boutron A, Chen YC, Cox JE, Cardon CM, Van Vranken JG, Dephoure N, Redin C, **Boudina S**, Gygi SP, Brivet M, Thummel CS, Rutter J (2012). A mitochondrial pyruvate carrier required for pyruvate uptake in yeast, Drosophila, and humans. Science, 337(6090), 96-100.

39) **Boudina S**, Sena S, Sloan C, Tebbi A, Han YH, O'Neill BT, Cooksey RC, Jones D, Holland WL, McClain DA, Abel ED (2012). Early mitochondrial adaptations in skeletal muscle to diet-induced obesity are strain dependent and determine oxidative stress and energy expenditure but not insulin sensitivity. Endocrinology, 153(6), 2677-88.

40) Bugger H, Riehle C, Jaishy B, Wende AR, Tuinei J, Chen D, Soto J, Pires KM, **Boudina S**, Theobald HA, Luptak I, Wayment B, Wang X, Litwin SE, Weimer BC, Abel ED (2012). Genetic loss of insulin receptors worsens cardiac efficiency in diabetes. J Mol Cell Cardiol, 52(5), 1019-26.

41) Li Y, Wende AR, Nunthakungwan O, Huang Y, Hu E, Jin H, **Boudina S**, Abel ED, Jalili T (2012). Cytosolic, but not mitochondrial, oxidative stress is a likely contributor to cardiac hypertrophy resulting from cardiac specific GLUT4 deletion in mice. FEBS J, 279(4), 599-611.

42) Ishiwata T, Orosz A, Wang X, Mustafi SB, Pratt GW, Christians ES, **Boudina S**, Abel ED, Benjamin IJ (2012). HSPB2 is dispensable for the cardiac hypertrophic response but reduces mitochondrial energetics following pressure overload in mice. PLoS ONE, 7(8), e42118.

43) **Boudina S**, Abel ED (2010). Diabetic cardiomyopathy, causes and effects. Rev Endocr Metab Disord, 11(1), 31-9.

44) Singhal AK, Symons JD, **Boudina S**, Jaishy B, Shiu YT (2010). Role of Endothelial Cells in Myocardial Ischemia-Reperfusion Injury. Vascular Disease Prevention, 7, 1-14.

45) Wright JJ, Kim J, Buchanan J, **Boudina S**, Sena S, Bakirtzi K, Ilkun O, Theobald HA, Cooksey RC, Kandror KV, Abel ED (2009). Mechanisms for increased myocardialfatty acid utilization following short-term high-fat feeding. Cardiovasc Res, 82(2), 351-60.

46) **Boudina S**, Bugger H, Sena S, O'Neill BT, Zaha VG, Ilkun O, Wright JJ, Mazumder PK, Palfreyman E, Tidwell TJ, Theobald H, Khalimonchuk O,

Wayment B, Sheng X, Rodnick KJ, Centini R, Chen D, Litwin SE, Weimer BE, Abel ED (2009). Contribution of impaired myocardial insulin signaling to mitochondrial dysfunction and oxidative stress in the heart. Circulation, 119(9), 1272-83.

47) Bugger H, **Boudina S**, Hu XX, Tuinei J, Zaha VG, Theobald HA, Yun UJ, McQueen AP, Wayment B, Litwin SE, Abel ED (2008). Type 1 diabetic akita mouse hearts are insulin sensitive but manifest structurally abnormal mitochondria that remain coupled despite increased uncoupling protein 3. Diabetes, 57(11), 2924-32.

48) Lehman JJ, **Boudina S**, Banke NH, Sambandam N, Han X, Young DM, Leone TC, Gross RW, Lewandowski ED, Abel ED, Kelly DP (2008). The transcriptional coactivator PGC-1alpha is essential for maximal and efficient cardiac mitochondrial fatty acid oxidation and lipid homeostasis. Am J Physiol Heart Circ Physiol, 295(1), H185-96.

49) Jouihan HA, Cobine PA, Cooksey RC, Hoagland EA, **Boudina S**, Abel ED, Winge DR, McClain DA (2008). Iron-mediated inhibition of mitochondrial manganese uptake mediates mitochondrial dysfunction in a mouse model of hemochromatosis. Mol Med, 14(3-4), 98-108.

50) Benjamin IJ, Guo Y, Srinivasan S, **Boudina S**, Taylor RP, Rajasekaran NS, Gottlieb R, Wawrousek EF, Abel ED, Bolli R (2007). CRYAB and HSPB2 deficiency alters cardiac metabolism and paradoxically confers protection against myocardial ischemia in aging mice. Am J Physiol Heart Circ Physiol, 293(5), H3201-9.

51) **Boudina S**, Sena S, Theobald H, Sheng X, Wright JJ, Hu XX, Aziz S, Johnson JI, Bugger H, Zaha VG, Abel ED (2007). Mitochondrial energetics in the heart in obesity related diabetes: direct evidence for increased uncoupled respiration and activation of uncoupling proteins. Diabetes, 56 (10), 2457-66.

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54) **Boudina S**, Abel ED (2007). Diabetic cardiomyopathy revisited. Circulation, 115(25), 3213-23.

55) Sano M, Izumi Y, Helenius K, Asakura M, Rossi DJ, Xie M, Taffet G, Hu L, Pautler RG, Wilson CR, **Boudina S**, Abel ED, Taegtmeyer H, Scaglia F, Graham BH, Kralli A, Shimizu N, Tanaka H, Mäkelä TP, Schneider MD (2007). Ménage-à-trois 1 is critical for the transcriptional function of PPARgamma coactivator 1. Cell Metab, 5(2), 129-42.

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58) **Boudina S**, Sena S, O'Neill BT, Tathireddy P, Young ME, Abel ED (2005). Reduced mitochondrial oxidative capacity and increased mitochondrial uncoupling impair myocardial energetics in obesity. Circulation, 112(17), 2686-95.

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opening the mitochondrial ATP- sensitive K(+) channel protects the ischemic heart. Am J Physiol Heart Circ Physiol, 283(1), H284-95.

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64) **Boudina S**, Laclau MN, Tariosse L, Daret D, Gouverneur G, Bonoron-Adèle S, Saks VA, Dos Santos P (2002). Alteration of mitochondrial function in a model of chronic ischemia in vivo in rat heart. Am J Physiol Heart Circ Physiol, 282(3), H821-31.

65) Laclau MN, **Boudina S**, Thambo JB, Tariosse L, Gouverneur G, Bonoron-Adele S, Saks VA, Garlid KD, Dos Santos P (2001). Cardioprotection, by ischemic Preconditioning, preserves mitochondrial function and functional coupling between adenine nucleotide translocase and creatine kinase. J Mol Cell Cardiol, 33(5), 947-56.

NON-PEER-REVIEWED JOURNAL ARTICLES

Boudina S (2009). Clinical manifestation of diabetic cardiomyopathy. Heart Metab, 45, 10-14.

BOOK CHAPTERS

1) Autophagy in Health and Disease, 2st Edition

Chapter 13: Autophagy in Adipose Tissue
Editors: Beverly Rothermel and Abhinav Diwan
Elsevier 2022

2) Mitochondria in Obesity and Type 2 Diabetes, 1st Edition

Chapter 10: Role of Mitochondria in Cardiovascular Co-Morbidities Associated with Obesity and Type 2 Diabetes.
Editors: Beatrice Morio Luc Penicaud and Michel Rigoulet
Elsevier 2019

TEACHING RESPONSIBILITIES

2022-Present, Facilitator, MBIOL 6300-001: Capstone Preparation Course, University of Utah, Bioscience PhD Program
2017-Present, Co-lecturer, 6440: Macronutrient Metabolism, University of Utah, College of Health
2018-Present Instructor, BIO C 6600: Metabolic Regulation, University of Utah, Biochemistry
2015 Facilitator, INTMD: Circulation, Respiration, and Regulation - Cased Based Learning

2014 Facilitator, INTMD: Circulation, Respiration, and Regulation - Case Based Learning
9/19/2011 Instructor, BIOL 2870: Faculty Research Seminar, University of Utah, Biology
11/17/ 2010
Instructor, Instructor ESS 6384: Adv Cardio Phys, 6 students, University of Utah, Exercise and Sport Science

TRAINEE SUPERVISION

Junior Faculty
2020-Present, Advisor/Mentor, Rajeshwary Ghosh, University of Utah, Project Title: The role of sequestosome 1/p62 in cardiac function.

Post-doctoral Fellows
2022-Present, Advisor/Mentor, Benjamin Werbner, University of Utah, Project Title: The interplay between cardiac mitochondrial energetics and fibrosis in heart failure.
2020-2022, Advisor/Mentor, Jacob Garrittson, University of Utah, Project Title: The role of BMPER in adipose tissue.
2018 - 2019
Advisor/Mentor, Maroua Ferhat, University of Utah, Project Title: Adipose progenitors and the development of visceral obesity.
2016 -2019
Supervisor, Sara Ortega, University of Utah, Project Title: The role of oxidative stress in mitophagy and brown adipose tissue function
2016 Supervisor, Youn Jeong Choi, University of Utah, Project Title: Mechanisms underlying adipose browning by Oct1 transcription factor.
2014 -2015
Advisor/Mentor, Janaina Paulini Aguiar, University of São Paulo Medical School, Project Title: The effect of hyperinsulinemia on cardiac protection by ischemic preconditioning.
2013 -2014
Advisor/Mentor, Gabriela Silva Monteiro de Paula, Federal University of Rio de Janeiro, Project Title: The role of neuromedin B in adipose tissue function.
2013 -2014
Advisor/Mentor, Samuel Valenca, Rio de Janeiro State University (UERJ), Project Title: Redox regulation of white adipose progenitor cell proliferation and differentiation.
2012 -2019
Supervisor, Karla Pires, University of Utah, Project Title: Insulin resistance and autophagy regulation during cardiac aging.
2012 -2015
Supervisor, Yong Hwan Han, University of Utah, Post-doctoral fellow

Project Title: The impact of fat-specific deletion of SOD2 on white adipose tissue function and whole-body insulin sensitivity.
2011 -2013
Supervisor, Olesya Ilkun, University of Utah, Project Title: Proteomic and Metabolomic Profiling of Redox-Dependent Pathways Regulating White Adipose Progenitor Cells Proliferation and Differentiation.
2011 -2014
Supervisor, Shaobo Pei, University of Utah, Project Title: The role of SOD2 in brain function.
2010 Supervisor, Ali Tebbi, University of Utah, Project Title: The role of SOD2 in body weight and energy expenditure regulation.
2010 -2011
Supervisor, Crystal Sloan, University of Utah, Project Title: Regulation of cardiac autophagy by the insulin signaling pathway.

PhD Students
2021-Present, Mentor/Advisor, Omid T Rouzbehani, NUIP, College of Health, University of Utah, Project Title: Mechanisms underlying sex-specific cardiomyopathy phenotype following PRDM16 deletion/mutation.
2021-Present
2018 -2021, Co-Mentor, Alan Achenbach, University of Utah, Project Title: Characterization of novel cell surface markers for adipose progenitors in visceral fat of human and mice.
2013 -2018, Supervisor, Tanya Forostyan, University of Utah, Project Title: The role of the retinol transporter Stra6L in adipose tissue inflammation.

Master's Students
Mentor/Advisor, Jiabi Zhang, NUIP, College of Health, University of Utah, Project Title: The roles of BMPER and EFHD1 in adipose tissue progenitor cells differentiation.
2019 -2021
Advisor/Mentor, Vishaka Vinod, University of Utah, Project Title: The role of Prdm16 in left ventricular non-compaction cardiomyopathy.
2018-2020
Supervisor, Alicia Youlton, University of Utah, Project Title: Redox regulation of thermogenesis.

MD/PhD students
2003-2007 Supervisor, Brian O'Neil, University of Utah, Project Title: Regulation of substrate utilization and mitochondrial function by PI3-Kinase and Akt.

Summer Medical Students

2023, Advisor/Mentor, Jonathan Chapman, University of Utah Medical Student Research Program, Project Title: The efficacy of Mavacamten in reducing cardiac fibrosis in heart failure with preserved ejection fraction.
2022, Advisor/Mentor, Travis M. Hotchkiss, University of Utah Medical Student Research Program, Project Title: Cardiac mitochondrial function in Prdm16 deleted mice.
2021, Advisor/Mentor, Ellenor Chi, University of Utah Medical Student Research Program, Project Title: Post-developmental roles of Prdm16 in the heart.
2019
Advisor/Mentor, Sidney Vowles, University of Utah Medical Student Research Program, Project Title: Characterizing the phenotype of germline deletion of Prdm16 in the heart.
2012
Advisor/Mentor, Kristina Evans, University of Utah, Project Title: The role of manganese superoxide dismutase (MnSOD) in white adipose tissue progenitor's differentiation using SiRNA knockdown strategy.
2011
Supervisor, Donya Mohebali, University of Utah, Medical Student Summer Research, Project Title: The Role of Radical Oxygen Species in Diet-Induced Obesity.
2005
Supervisor, Salwa Abdel Aziz, University of Utah, Project Title: The effects of increased oxidative damage and FA-induced mitochondrial uncoupling on cardiac function of obese diabetic (db/db) mice.
2005-2007
Supervisor, Kimberly Fountain, University of Utah, Project Title: Regulation of mitochondrial function by the insulin signaling pathway in skeletal muscle.
2004
Supervisor, Eric Palfreyman, University of Utah, Project Title: the effect of increased fatty acid utilization on mitochondrial function in insulin resistant hearts.

<u>Undergraduate/post-bac Students</u>
2023
Advisor/Mentor, Nick Wong, University of Utah Summer Undergraduate Research Program (SURE), Project Title: Sex-specific transcriptional regulation by PRDM16 in the heart.
2023
Advisor/Mentor, Cara Lewis, The University of Utah Native American Research Internship (NARI) Program, Project Title: Fbxo44 is a sex-specific transcription target of PRDM16 in the heart.
2022

Advisor/Mentor, Sierra Parker, University of Utah Rural & Underserved Utah Training Experience (RUUTE) program, Project Title: The role of BMPER in adipogenesis.
2021
Advisor/Mentor, Salam Alzouabi, University of Utah, Project Title: Cardiac transcription by PRDM16.
2021-2023
Advisor/Mentor, Michael Goodman, University of Utah, Project Title: The role of Prdm16 in the regulation of Perm1 and mitochondrial energetics.
2021
Advisor/Mentor, Isaac D. Cao, University of Utah Summer Program for Undergraduate Research, Project Title: Understanding the role of p62 in hypoxic stress in the heart.
2020- 2023
Advisor/Mentor, Tala Hammond, University of Utah, Project Title: Autophagy and liver glucose output.
2020-Present
Advisor/Mentor, Amir Nima Fatahian, University of Utah, Project Title: Adipose and liver autophagy and insulin resistance.
2019
Advisor/Mentor, Emile Eich, The University of Utah Native American Research Internship (NARI) Program, Project Title: Optimizing lipid staining in primary visceral adipose progenitors.
2016 -2018
Advisor/Mentor, William West, University of Utah, Project Title: Investigate the role of redox in the regulation of mitochondrial uncoupling in brown adipose tissue.
2017
Advisor/Mentor, Shane Littlefoot, The University of Utah Native American Research Internship (NARI) Program, Project Title: Metabolic flux analysis in primary brown adipocytes.
2016
Advisor/Mentor, River Gunville, University of Utah Native American Research Internship (NARI) Program, Project Title: Modeling systemic hyperinsulinemia in cultured cells for the study of Cardiac autophagy.
2015
Supervisor, Saydie Sago, University of Utah Native American Research Internship (NARI) Program, Project Title: The role of autophagy in the insulin resistant heart.
2015 - 2017
Supervisor, Katarina Mountz, University of Utah Undergraduate Research Opportunity Program, Project Title: Characterization of adipose progenitors from different fat depots in mice.
2014 - 2015

Supervisor, Katie Lami, University of Utah, Undergraduate Research Opportunity Program, Project Title: the role of IGF-1 signaling in the regulation of cardiac autophagy.
2014 -2015
Supervisor, Zane Blank, University of Utah, Project Title: Cell sorting of adipose progenitors.
2014
Advisor/Mentor, Shiann Dreadfulwater, University of Utah Native American Research Internship (NARI) Program, Project Title: The effect of hyperinsulinemia on cardiac autophagy.
2014 -2015
Supervisor, Abhilasha Manandhar, University of Utah, Project Title: Isolation of adipose progenitors from different fat depots in mice.
2014 -2015
Supervisor, Khanh Cao, University of Utah, Project Title: The role of MnSOD in fat expansion.
2014 Supervisor, Ikram Raed, University of Utah, Project Title: LC3 puncta quantification in frozen heart sections.
2013 -2014
Supervisor, Sean William Brough, University of Utah, Project Title: Genotyping mitochondria-targeted catalase transgenic mice.
2013 -2014
Supervisor, Sahar Dastghaib, University of Utah, Project Title: Superoxide detection in frozen brain sections.
2013
Supervisor, Fiorella Mollozibetti, University of Utah, Project Title: ROS generation and mitochondrial function in brain specific MnSOD knockout mice.
2013
Supervisor, Marina Valente, University of Utah, Project Title: The role of MnSOD in differentiation of 3T3L1 preadipocytes.
2012 -2015
Supervisor, Braedon Murdock, University of Utah, Project Title: The role of Oct1 in Adipogenesis.
2012 -2013
Supervisor, Andrea Myers, University of Utah, Project Title: Generation of mCherry total insulin receptor knockout mice.
2011 -2013
Supervisor, Michael Hofer, University of Utah, Project Title: Generation of cardiac-specific SOD2 knockout mice.
2011 -2012
Supervisor, Justin Peck, University of Utah, Project Title: Phenotyping of the brain specific SOD2 knockout mice.
2011 -2012

Supervisor, Seyran Saber, University of Utah, Project Title: Generation of fat specific SOD2 knockout mice.
2011 -2013
Supervisor, Robert Manzanares, University of Utah, Project Title: Mechanism of cardioprotection regulated by the insulin signaling pathway.
2009 -2010
Supervisor, Xu Shane Liu, University of Utah, Project Title: Mechanisms for impaired cardioprotection by hyperinsulinemia.
2009
Supervisor, Assad Rauf, University of Utah, Project Title: GLUT4 translocation in response to insulin in the heart of UCP3 knockout mice fed high fat diet.
2009
Supervisor, Donya Mohebali, University of Utah, Project Title: Diet-induced adipogenesis in superoxide dismutase 2 heterozygous mice.
2009 -2011
Supervisor, Tanner Fullmer, University of Utah, Project Title: The role of insulin signaling in ischemic preconditioning.
2008-2009
Supervisor, Timothy Tidwell, University of Utah, Project Title: Insulin signaling in the heart of UCP3 knockout mice.
2008
Supervisor, Calvin Stone, University of Utah, Project Title: Characterization of mitochondrial function in high fat diet fed UCP3 knockout mice.
2004-2006
Supervisor, Jordan Wright, University of Utah, Project Title: Mechanisms responsible for altered cardiac metabolism in diet-induced obesity.
2003
Supervisor, Jenny Billy, University of Utah, Project Title: Determination of reactive oxygen generation and aconitase activity in insulin resistant mouse heart.

<u>High School Students</u>
2022
Supervisor, Kareem Rifaat, Project Title: Modeling heart failure with preserved ejection fraction in mice.
2016
Supervisor, Jonathan Shipp, Project Title: Morphometric analysis of adipocyte number and diameter in aging mice.
2015
Supervisor, Paige Davis, Summer High School Students/Bioscience Research program, Project Title: Adipose stem cells differentiation.
2013
Supervisor, David Ho, Project Title: Protein carbonylation in MnSOD deleted cells.
2012

Supervisor, Chandler Whitlock, Project Title: Characterizing the brain specific manganese superoxide dismutase knockout mice.
2011
Supervisor, Alina Tran, Project Title: Generation of brain-specific SOD2 knockout mice.

GRADUATE STUDENT COMMITTEES

2023-Present
Committee Member, Tarun Yadav, NUIP, College of Health, University of Utah
2023-Present
Committee Member, Mark David Lee, Bioscience PhD program, University of Utah
2023-Present
Committee Member, Jessica Van Onselen, NUIP, College of Health, University of Utah
2023-Present
Committee Member, James Truart Carrington, MD/PhD program, University of Utah
2021-Present
Committee Member, Sohom Mookherjee, NUIP, College of Health, University of Utah
2021-Present
Committee Member, Marissa Jo Brothwell, NUIP, College of Health, University of Utah
2020-Present
Committee Member, Sean Tatum, NUIP, College of Health, University of Utah
2019-2022
Committee Member, Lacie M. Peterson, NUIP, College of Health, University of Utah
2018-2023
Committee Member, Kathryn Davis, Bioscience PhD program, University of Utah
2017-2021
Committee Member, Trevor S. Tippetts, NUIP, College of Health, University of Utah
2017-2022
Committee Member, Jae Min Cho, NUIP, College of Health, University of Utah
2019-2021
Committee Chair, Vishaka Vinod, University of Utah
2013-2018
Committee Member, Jordan Johnson, NUIP, College of Health, University of Utah
2015-2020
Committee Chair, Tanya Forostyan, Oncological Sciences, University of Utah
2017-2019
Committee Chair, Alicia Youlton, NUIP, College of Health, University of Utah

2013-2018
Committee Member, Rana Smalling, Biochemistry, University of Utah
University Committees