CURRICULUM VITAE

Katsu Funai, Ph.D.

PRESENT POSITION:

Associate Professor
Diabetes & Metabolism Research Center
Physical Therapy & Athletic Training
Molecular Medicine Program
University of Utah

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Eccles Institute of Human Genetics
Salt Lake City, Utah 84112
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Office: (801) 585-1781

PERSONAL INFORMATION:

Citizenship: Japan U.S. Immigration Status: Permanent Resident
Spouse: Amanda Funai, PhD, Associate Instructor of Engineering, University of Utah
Children: Andrew (12), Seth (10), Logan (8), Noah (5)

RESEARCH DESCRIPTION:

Lipids are the most abundant organic constituents in many humans. The rise in obesity prevalence has prompted a need for a more refined understanding of the effects of lipid molecules on cell physiology. In skeletal muscle, deposition of lipids can be associated with insulin resistance that contributes to the development of diabetes. Muscle cells are equipped with the molecular machinery to convert and sequester lipid molecules, thus rendering them harmless. Induction of mitochondrial and lipogenic flux in the setting of elevated lipid deposition, such that occurs with exercise, can protect muscle from lipid-induced poisoning of the cellular machinery.

We utilize cell lines, genetically-modified mice and primary muscle cells from human subjects to examine mechanisms whereby skeletal muscles develop and/or evade toxic effects of lipid influx. Our laboratory is located in the Eccles Institute of Human Genetics at the University of Utah. Please email kfunai@utah.edu for inquiry on our mouse models, collaborative opportunities or available positions.

EDUCATION:

2013 Postdoctoral Training. Washington University. Endocrinology. Mentor: Clay F. Semenkovich, M.D.
Advisory Committee: Brian Finck, Ph.D., Kevin Yarasheski, Ph.D., John Turk, M.D. Ph.D.
2009 Ph.D. University of Michigan. Kinesiology. Mentor: Gregory D. Cartee, Ph.D.
Dissertation Committee: Jeffrey F. Horowitz, Ph.D., Charles F. Burant, M.D. Ph.D., Jiandie Lin, Ph.D.
2005 M.S. Boston University. Physiology. Mentor: Roger A. Fielding, Ph.D.
Thesis Committee: Susan Kandarian, Ph.D.
2004 B.S. Boston University. Physiology.

HONORS:

2019 International Conference on the Bioscience of Lipids, Lipoquality Fellowship
2019 Vitae 2019: The People, The Stories, The Research, University of Utah
2018 Larry H. & Gail Miller Family Driving Out Diabetes Initiative Award
2018 Visiting Professorship, School of Sport Sciences, Waseda University
2017 HHP Outstanding Researcher Award, Nominee, East Carolina University
2017 Brody Summer Biomedical Research Program Mentor Award, East Carolina University
2015 American Diabetes Association Pathway Award – Institutional Nomination/Advanced to Final Review
2013 NIDDK K01 Mentored Research Scientist Development Award, Priority Score: 10
2013 Early Career Investigator Award, Kern Lipid Conference
2012 American Physiological Society Research Recognition Award, Integrative Biology of Exercise VI
2012 Washington University Cardiovascular Research Day Presentation 1st Prize

2011 Ruth L. Kirschstein National Research Service Award (F32) Postdoctoral Fellowship, Priority Score: 10
2011 American Heart Association: Midwest Affiliate Postdoctoral Fellowship, Percentile Rank: 1%
2011 American Diabetes Association Mentor-Based Postdoctoral Fellowship
2010 School of Kinesiology Outstanding Graduate of the Year, University of Michigan
2009 Rackham Predoctoral Fellowship, University of Michigan
2009 Rackham Block Grant, University of Michigan
2009 Shirley Cooper Graduate Student Award, University of Michigan
2005 Graduate Student Research Assistantship, University of Michigan
2004 Graduate Student Scholarship, Boston University
2002 Faculty Matching Grant, Boston University
1998 Valedictorian, International Baccalaureate: 40/42, ICS-Zurich, Switzerland

PROFESSIONAL AFFILIATIONS:

2007-current American Diabetes Association
2008-current American Physiological Society
2012-current American Society for Biochemistry and Molecular Biology
2017-current American Heart Association

PROFESSIONAL EXPERIENCE:

2019-current Associate Professor of Physical Therapy & Athletic Training, University of Utah
2019-current Associate Professor, Molecular Medicine Program, University of Utah
2019-current Adjunct Associate Professor of Nutrition & Integrative Physiology, University of Utah
2017-2019 Assistant Professor of Physical Therapy & Athletic Training, University of Utah
2017-2019 Assistant Professor, Molecular Medicine Program, University of Utah
2017-2019 Adjunct Assistant Professor of Nutrition & Integrative Physiology, University of Utah
2017-current Adjunct Professor of Kinesiology, East Carolina University
2018 Visiting Professor, School of Sport Sciences, Waseda University
2016-2017 Director, Bioenergetics PhD Program, East Carolina University
2015-2017 Director, Undergraduate Research Opportunity Program (UROP) in Kinesiology, East Carolina University
2013-2017 Assistant Professor of Kinesiology, East Carolina University
2013-2017 Adjunct Assistant Professor of Physiology, East Carolina University
2013 Instructor in Medicine, Division of Endocrinology, Metabolism and Lipid Research, Washington University School of Medicine
2010-2013 Adjunct Instructor in Physical Therapy, Washington University School of Medicine
2010-2013 Postdoctoral Research Scholar, Division of Endocrinology, Metabolism and Lipid Research, Washington University School of Medicine
2005-2009 Graduate Student Research Assistant, Muscle Biology Laboratory, School of Kinesiology, University of Michigan
2006 Rotation Student, National Resource for Proteomics & Pathways, Department of Biological Chemistry, University of Michigan
2004-2005 Research Associate, Nutrition, Exercise Physiology, and Sarcopenia Laboratory, Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University
2001-2005 Research Assistant, Human Physiology Laboratory, Sargent College of Health and Rehabilitation Sciences, Boston University

TEACHING EXPERIENCE:

COURSES

2019-current Regulation of Metabolism, BIOC6600, Co-Instructor
Department of Biochemistry, University of Utah
2019-current Muscle Physiology, NUIP6830, Co-Instructor
Department of Nutrition & Integrative Physiology, University of Utah
2018-current Translational Research in Rehabilitation, RHSCI 7000, Contributor

Department of Physical Therapy & Athletic Training, University of Utah
2018 Underlying Mechanisms for Substrate Homeostasis, Instructor
School of Sport Sciences, Waseda University
2017 Research Proposal Strategies & Preparation, BIOC/ANAT 7365, Co-Director
Department of Biochemistry/Cell Anatomy and Biology, East Carolina University
2015-2017 Biochemistry/Bioenergetics II, BIOC/KINE 8320, Co-Instructor
Department of Biochemistry/Kinesiology, East Carolina University
2014-2017 Translational Exercise Physiology, KINE 7447, Co-Instructor
Department of Kinesiology, East Carolina University
2014-2017 Research/Advanced Topics in Bioenergetics, KINE 8330&8333, Instructor
Department of Kinesiology, East Carolina University
2013-2017 Undergraduate Independent Research, KINE/BIOL 4991&4992, Mentor
Department of Kinesiology/Biology, East Carolina University
2013-2014 Advanced Exercise Physiology, KINE 6207, Contributor
Department of Kinesiology, East Carolina University
2011-2013 Muscle Structure, Function and Mutability, M22 600, Co-Instructor
Washington University School of Medicine Program in Physical Therapy
2010-2012 Exercise Physiology, PT621, Co-Instructor
Washington University School of Medicine Program in Physical Therapy
2004-2005 Clinical Exercise Physiology Lab, HS342/542, Instructor
Department of Health Science, Boston University

TRAINEES

Graduate Students/Postdocs

2020-current Alek Peterlin, PhD student, Molecular Biology, University of Utah, Rotation Student
2019-current Marisa Lang, PhD student, Nutrition & Integrative Physiology, University of Utah, Chair
2019-current Jonathan Petrocelli, PhD student, Rehabilitation Science, University of Utah, Dissertation Committee
2019 Vanja Panic, PhD student, Biochemistry, University of Utah, Dissertation Committee
2019-current Prasoona Karra, PhD student, Nutrition & Integrative Physiology, University of Utah, Dissertation Committee
2018-current Piyarat Siripoksup, PhD student, Rehabilitation Science, University of Utah, Chair
2018-2019 Mallikarjun Patil, Postdoctoral Fellow, University of Utah, Mentor
2018-current Hiroaki Eshima, Postdoctoral Fellow, University of Utah, Mentor
2018-current Rebekah Nicholson, MS student, Nutrition & Integrative Physiology, University of Utah, Thesis Committee
2017-2018 Alicia Youlton, MS student, Nutrition & Integrative Physiology, University of Utah, Thesis Committee
2017 Chanel Coleman, Postbaccalaureate Fellow, East Carolina Diabetes & Obesity Institute, Mentor
2016-2017 Shawna McMillin, PhD student, Bioenergetics, East Carolina University, Dissertation Committee
2016-current Patrick Ferrara, PhD student, Bioenergetics, East Carolina University, Chair
Nutrition & Integrative Physiology, University of Utah, Chair
2016-2017 Auston Keel, MS student, Kinesiology, East Carolina University, Thesis Committee
2016-2017 Spencer Miller, MS student, Kinesiology, East Carolina University, Thesis Committee
2015-current Jordan Johnson, PhD student, Bioenergetics, East Carolina University, Chair
Nutrition & Integrative Physiology, University of Utah, Chair
2015-2018 Sherri Moore, PhD student, Interdisciplinary Biomedical Program, Dissertation Committee
2015-2017 Margaret Nelson, PhD student, Pharmacology and Toxicology, Dissertation Committee
2015-2016 Kristen Turner, MS student, Kinesiology, East Carolina University, Thesis Committee
2014-current Anthony Verkerke, PhD student, Bioenergetics, East Carolina University, Chair
Nutrition & Integrative Physiology, University of Utah, Chair
2014-2015 Patrick Ferrara, MS student, Kinesiology, East Carolina University, Chair
2014-2017 Timothy Heden, Postdoctoral Fellow, East Carolina Diabetes & Obesity Institute, Mentor
University of Minnesota Medical Center, Co-Mentor

2014-2015 Matthew Hinkley, PhD student, Bioenergetics, East Carolina University, Dissertation Committee
2014-2016 Madaniah Zakari, PhD student, Physiology, East Carolina University, Advisory Committee
2014-2016 Tai-Yu Huang, PhD student, Bioenergetics, East Carolina University, Dissertation Committee
2014-2016 Jamie Hibbert, PhD student, Bioenergetics, East Carolina University, Dissertation Committee
2014-2015 Matthew Salzano, MS student, Kinesiology, East Carolina University, Thesis Committee
2013-2014 Christina Oricino, MS student, Kinesiology, East Carolina University, Thesis Committee

Undergraduate Students
2019-current Anahy Salcedo, Kinesiology, University of Utah
2019-current Hai Chau Ngoc Le, Biology, University of Utah
2018 Amy Nguyen, Health, Society, and Policy, University of Utah
2018-2019 Thea Benally, Exercise Science, University of New Mexico
2017-2019 Luke Garcia, Biomedical Engineering, University of Utah
2016-2017 Chanel Coleman, Kinesiology, East Carolina University
2016 Danya Norman, Kinesiology, East Carolina University
2016-2017 Grayson Fellows, Kinesiology, East Carolina University
2016 Armondo Balotti, Kinesiology, East Carolina University
2015-2016 Tara Narowski, Kinesiology, East Carolina University
2015 Ian Smith, Kinesiology, East Carolina University
2015 Lindsey Corbett, Kinesiology, East Carolina University
2015 Madelaine Fellela, Kinesiology, East Carolina University
2015 Thomas Sartori, Kinesiology, East Carolina University
2014-2016 Stephanie Strong, Biology/Chemistry, East Carolina University
2014-2015 Edward Wentzler, Kinesiology, East Carolina University
2014 Charles Lowery, Kinesiology, East Carolina University
2014 Taylor Riggs, Kinesiology, East Carolina University
2014 Julia Atkinson, Kinesiology, East Carolina University

TRAINEE AWARDS

2020 Keystone Symposia Scholarship: New Insights into the Biology of Exercise (Piyarat Siripoksup)
2019 Driving Out Diabetes Initiative Research Symposium, Poster Competition: First Place (Jordan Johnson)
2019 American Heart Association Association-Wide Predoctoral Fellowship (Jordan Johnson)
2019 US Human Health Services Internship, ASPE Strategic Planning (Luke Garcia)
2019 Wayne Askew Award for Research Excellence, Department of Nutrition & Integrative Physiology, University of Utah (Anthony Verkerke)
2019 Native American Research Internship, University of Utah (Thea Benally)
2019 Undergraduate Research Opportunity Program (UROP) Award, University of Utah (Anahy Salcedo)
2018 Larry H. & Gail Miller Family Driving Out Diabetes Initiative Predoctoral Fellowship (Patrick Ferrara)
2018 American Heart Association Association-Wide Predoctoral Fellowship (Anthony Verkerke)
2018 Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) Travel Scholarship (Thea Benally)
2018 Health Sciences LEAP Award, University of Utah (Amy Nguyen)
2018 Uehara Memorial Foundation Research Fellowship (Hiroaki Eshima)
2018 Native American Research Internship, University of Utah (Thea Benally)
2018 Undergraduate Research Opportunity Program (UROP) Award, University of Utah (Luke Garcia)
2017 Japan Society for the Promotion of Science Research Fellowship (Hiroaki Eshima)
2017 Ruth L. Kirschstein National Research Service Award Postdoctoral Fellowship, NIH/NIDDK (Timothy Heden)
2017 Local Undergraduate Research Award in Physiology, American Physiological Society
2017 Seahorse Bioscience Travel Award (Anthony Verkerke)
2017 Seahorse Bioscience Travel Award (Timothy Heden)
2017 Keystone Symposia Future of Science Fund Scholarship: Diabetes (Anthony Verkerke/Patrick Ferrara)
2017 Brody Summer Biomedical Research Fellowship (Chanel Coleman)
2016 American Physiological Society Research Recognition Award, Integrative Biology of Exercise VII

(Jordan Johnson)
2016 American Physiological Society Research Recognition Award, Integrative Biology of Exercise VII (Timothy Heden)
2016 Clinical Loan Repayment Program, NIH/NIDDK (Timothy Heden)
2016 Undergraduate Clinical Research Internship, Vanderbilt University School of Medicine (Stephanie Strong)
2016 American Heart Association Mid-Atlantic Postdoctoral Fellowship (Timothy Heden)
2016 RCAW Postdoctoral Student Award (Timothy Heden)
2016 Gabriel R. Cipau Scholarship, East Carolina University (Stephanie Strong)
2016 Advances in Skeletal Muscle Biology in Health and Disease Presentation (Timothy Heden)
2016 Research Internship, Divers Alert Network (Tara Narowski)
2015 American Physiological Society/NHLBI, STRIDE Award (Stephanie Strong)
2015 American Physiological Society/NIDDK, STEP-UP Award (Stephanie Strong)
2015 Brody Summer Biomedical Research Fellowship (Edward Wentzler)
2015 Seahorse Bioscience Travel Award (Anthony Verkerke)
2015 Keystone Symposium Scholarship: Systems Biology of Lipid Metabolism (Anthony Verkerke)

SERVICE:

EXTRAMURAL

2019 Session Chair, "Integrative Physiology"
Cold Spring Harbor Meeting: Mechanisms of Metabolic Signaling
2019 Session Chair, "Workshop on Mitochondrial Biology in Heart and Skeletal Muscle"
Keystone Symposia on Mitochondrial Biology in Heart and Skeletal Muscle
2018-current Conference Abstract Reviewer, American Diabetes Association Scientific Sessions
2017 Symposium Chair, "Cellular Energy balance as a Basis for Metabolic (Dys)Regulation"
American Diabetes Association 77th Scientific Sessions
2017 Moderator, "Cellular & Molecular Metabolism"
American Diabetes Association 77th Scientific Sessions
2016 Oral Session Chair, "Cellular Responses to Exercise in Insulin Targeted Tissues"
American Diabetes Association 76th Scientific Sessions
2014-2017 Committee Member, American Physiological Society Translational Physiology Interest Group
2014-2015 Co-Chair, "Translational Strategies for musculoskeletal regenerative medicine"
Experimental Biology 2015, Translational Physiology Interest Group Featured Topics

INTRAMURAL

2020 Adjunct Search Committee Member, Department of Nutrition & Integrative Physiology, Diabetes & Metabolism Research Center, University of Utah
2019-current Metabolomics Oversight Committee, Metabolomics Core, University of Utah
2019-current Faculty Mentor, Medical Student Research Program, University of Utah
2019 Co-Organizer, Rising Star Symposium, Metabolism Section, University of Utah
2018-current Steering Committee, Diabetes & Metabolism Research Center, University of Utah
2018-current Advisory Committee, Metabolic Phenotyping Core, University of Utah
2018-current Faculty Mentor, Native American Research Internship, University of Utah
2017-current Co-Director, Seminars in Metabolism, Diabetes & Metabolism Research Center, University of Utah
2017-current Admissions, Doctor of Physical Therapy Program, University of Utah
2017 Animal Research Advisory Group, East Carolina University
2017 Organizer, Undergraduate Research Symposium, Department of Kinesiology, East Carolina University
2017 Brody Summer Biomedical Research Program, Faculty Mentor, East Carolina University
2016-2017 Director, Bioenergetics PhD Program, East Carolina University
2016-2017 Chair, Bioenergetics Executive Committee, East Carolina University
2015-2017 Director, Undergraduate Research Opportunity Program/Kinesiology, East Carolina University
2016-2017 Selection Committee, Taft Diabetes and ECDOI Seminar Series, East Carolina University

2016-2017 College of Health and Human Performance Faculty Development Seminar Series, East Carolina University
2016-2017 Admissions Board, Brody Summer Biomedical Research Program, East Carolina University
2015-2017 Faculty Judge, Research & Creative Achievement Week Research Conference, East Carolina University
2014-2017 Peer Teaching Evaluator, East Carolina University
2013-2017 Grant Application Panel, East Carolina University
2012-2013 Preclinical Trial Leading Research Coordinator, Washington University
2010-2013 Diabetes Models Phenotyping Core, Washington University Diabetes Research Center
2010-2013 Animal Model Research Core, Washington University Nutrition Obesity Research Center
2009-2010 Center for Exercise Research Journal Seminar Series, Chair/Founder, University of Michigan
2008-2009 School of Kinesiology Dean Search, Graduate Student Representative, University of Michigan
2002-2005 Office of Residence Life, Resident Assistant, Boston University
2001-2002 Medical Intensive Care Unit, Volunteer Assistant, Massachusetts General Hospital
2001-2002 Pfizer Clinical Trial, Research Technician, Boston University

GRANT REVIEWS:

2019 Austrian Science Fund (FWF)
2019 NIH Pennington COBRE P&F
2018 NIDDK Special Emphasis Panel Study Section, NIH
2018 Center on Aging, University of Utah
2017 Skeletal Muscle Biology and Exercise Physiology (SMEP) Study Section, NIH
2017 French National Research Agency (ANR)
2015-2016 French Muscular Dystrophy Association (AFM-Telethon)
2015 Center for Human Health and the Environment Pilot Grant, North Carolina State University
2014-2020 Barth Syndrome Foundation Research Grant Program
2014 Central Michigan University Early Career Grant Program

MANUSCIPT REVIEWS:

Editorial Board

2013-2019 *Nature: Scientific Reports*
2018 *International Journal of Molecular Science (Guest Editor)*
2019-current *Frontiers in Endocrinology*
2019 *Frontiers in Physiology (Guest Editor)*

Reviewer

Acta Physiologica
American Journal of Pathology
American Journal of Physiology, Cell Physiology
American Journal of Physiology, Endocrinology & Metabolism
American Journal of Physiology, Regulatory, Integrative & Comparative Physiology
Applied Physiology, Nutrition, and Metabolism
Biochimica et Biophysica Acta – General Subjects
BioFactors
Calcified Tissue International
Diabetes
Diabetes Care
Diabetologia
Diabetology & Metabolic Syndrome
Endocrine
Exercise & Sport Sciences Reviews
FASEB Journal
JCI Insight

Journal of Applied Physiology
Journal of Clinical Endocrinology & Metabolism
Journal of Diabetes
Journal of Endocrinology
Journal of Physiology
Journal of Proteomics & Bioinformatics
Medicine & Science in Sports & Exercise
Molecular & Cellular Biochemistry
Molecular & Cellular Endocrinology
Molecular Medicine
Molecular Metabolism
Molecular Therapy
Nature Metabolism
Obesity
PLoS One
Redox Biology
Trends in Endocrinology & Metabolism

RESEARCH SUPPORT:

ACTIVE

R01 DK107397 (**PI: Funai**, Co-I: Neufer, Shaikh) 2/1/17-1/31/22
NIH/NIDDK $1,850,513
Title: "PE methylation in skeletal muscle energy efficiency"

R21 AG083077 (**PI: Funai**, Co-I: Drummond) 9/1/19-5/31/21
NIH/NIA $419,375
Title: "Mitochondrial phospholipids, ROS, and disuse atrophy"

1-19-ICTS-107 (PI: Drummond, **Co-I: Funai**) 1/1/19-12/31/21
American Diabetes Association: Innovative Clinical or Translational Science $600,000
Title: *Role of metformin on muscle and metabolic function in older adults during skeletal muscle disuse*

R03 AG064216 (PI: Drummond, **Co-I: Funai**) 9/1/19-5/31/21
NIH/NIA $152,500
Title: "Amplifying muscle and metabolic recovery in aging using metformin and leucine"

Driving Out Diabetes Predoctoral Fellowship (**PI: Funai**/Ferrara) 10/1/18-9/30/20
Larry H. & Gail Miller Family Foundation $50,000
Title: "Lands cycle and skeletal muscle insulin action"

2019 Pilot Grant Award (**PI: Funai**, Co-I: Drummond) 7/1/19-6/30/20
Center on Aging, University of Utah $20,000
Title: "Ferroptosis and disuse-induced muscle atrophy"

18PRE33960491 (PI: Verkerke) 7/1/18-6/30/20
American Heart Association: Association-Wide Predoctoral Fellowship $53,688
Title: "Muscle phospholipid methylation modulates SERCA energy efficiency to alter susceptibility for obesity"
Role: **Sponsor**

19PRE34380991 (PI: Johnson) 1/1/19-12/31/20
American Heart Association: Association-Wide Predoctoral Fellowship $53,688
Title: "Linking phosphatidylcholine synthesis to thermogenesis"
Rike: **Sponsor**

COMPLETED

P30 DK020579 (**PI: Funai**) 1/25/19-11/30/19
NIH/NIDDK: Washington University DRC P&F Grant $61,000
Title: "Phospholipid origin of NASH"

R03 DK109888 (**PI: Funai**, Co-I: Shaikh) 7/1/16-6/30/19
NIH/NIDDK $149,500
Title: "Skeletal muscle mitochondrial phospholipids and aerobic capacity"

H29-Research Fellowship (PI: Eshima) 2/1/18-3/31/19
Uehara Memorital Foundation ¥450,0000
Title: "Mechanisms for skeletal muscle contractile dysfunction in type 2 diabetes"
Role: **Sponsor**

F32 DK109556 (PI: Heden) 2/4/17-2/3/19
NIH/NIDDK: Ruth L. Kirschstein National Research Service Award $116,520
Title: "Skeletal muscle mitochondrial phosphatidylethanolamine and respiratory capacity"
Role: **Sponsor**

R03 DK109888 Supplement (**PI: Funai**) 7/1/17-10/31/17
NIH/NIDDK Research supplements to Promote Diversity in Health-Related Research $58,597
Title: "Supplement to DK109888"
Post-baccaluareate Fellow: Chanel Coleman

K01 DK095774 (**PI: Funai**) 8/1/13-9/30/17
NIH/NIDDK: Mentored Research Scientist Development Award $511,877
Title: "Skeletal muscle de novo lipogenesis and the glucose-fatty acid cycle"
Mentor: Clay F. Semenkovich/P. Darrell Neufer

L30 DK110338 (PI: Heden) 7/1/16-8/31/17
NIH/NIDDK: Clinical Loan Repayment Program $15,902
Title: "Aberrant adipose and muscle phospholipidome in obese insulin resistant humans"
Role: **Sponsor**

16POST30980047 (PI: Heden) 7/1/16-2/3/17
American Heart Association: Mid-Atlantic Affiliate Postdoctoral Fellowship $98,950
Title: "Skeletal muscle mitochondrial phosphatidylethanolamine and respiratory capacity"
Role: **Sponsor**

R25 HL115473 (Trainee: Strong) 5/1/15-7/31/15
American Physiological Society/NHLBI: STRIDE Summer Research Fellowship $5,700
Title: "PE methylation and white adipose browning"
Role: **Sponsor**

F32 DK095505 (**PI: Funai**) 9/1/12-6/30/13
NIH/NIDDK: Ruth L. Kirschstein National Research Service Award $109,732
Title: "Skeletal muscle de novo lipogenesis and the glucose-fatty acid cycle"
Mentor: Clay F. Semenkovich

12POST9430048 (**PI: Funai**) 1/1/12-8/31/12
American Heart Association: Midwest Affiliate Postdoctoral Fellowship $95,224
Title: "Skeletal muscle de novo lipogenesis and the glucose-fatty acid cycle"
Mentor: Clay F. Semenkovich

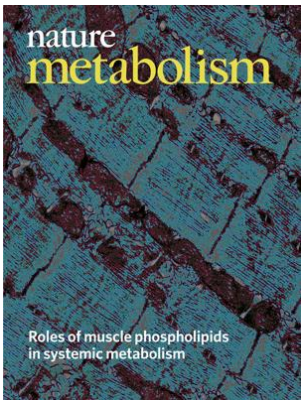
7-05-MN-55 (PI: Semenkovich) 10/1/11-12/31/11
American Diabetes Association: Mentor-Based Postdoctoral Fellowship
Title: "Role of organ-specific de novo lipogenesis in regulation of glucose and lipid metabolism"

T32 DK07120 (PI: Semenkovich) 2/1/10-9/30/11
NIH/NIDDK: Institutional National Research Service Award
Title: "Diabetes and Related Metabolic Diseases"

Rackham Predoctoral Fellowship (**PI: Funai**) 6/1/09-1/31/10
University of Michigan $27,000
The most prestigious predoctoral award for outstanding academic achievements
Title: "Effects of in vivo exercise and in vitro contractile activity on the regulation of AS160, TBC1D1 and glucose transport in rat skeletal muscle"
Mentor: Gregory D. Cartee

PEER REVIEWED PUBLICATIONS:

1. **Funai K**, Summers SA, Rutter J. Reign in the Membrane: How common lipids govern mitochondrial function. ***Current Opinion in Cell Biology***. *In Press.*
2. Johnson JM, Verkerke ARP, Maschek JA, Ferrara PJ, Lin C, Kew KA, Neufer PD, Lodhi IJ, Cox JE, **Funai K**. Alternative splicing of UCP1 by non-cell autonomous action of PEMT. ***Molecular Metabolism***. 31(1):55-66, 2020.
3. Mahmassani ZS, Reidy PT, McKenzie AI, Petrocelli JJ, Matthews O, de Hart N, Ferrara PJ, O'Connell R, **Funai K**, Drummond MJ. Absence of MyD88 from skeletal muscle protects female mice from inactivity-induced adiposity and insulin resistance. ***Obesity***. *In Press.*
4. McKenzie AI, Reidy PT, Nelson DS, Mulvey JL, Yonemura NM, Petrocelli JJ, Mahmassani ZS, Tippets TS, Summers SA, **Funai K**, Drummond MJ. Pharmacological inhibition of TLR4 ameliorates muscle and liver ceramide content after disuse in physically active mice. ***Am J Physiol Regul Integr Comp Physiol*****.** *In Press.*
5. Iñigo MR, Amorese AJ, Tarpey MD, Balestreri NP, Jones KG, Patteson DJ, Jackson KC, Torres MJ, Lin C, Smith CD, Heden TD, McMillin SL, Weyrauch LA, Stanley EC, Schmidt CA, Kilburg-Basnyat, BB, Reece SW, Psaltis CE, Leinwand LA, **Funai K**, McClung JM, Gowdy KM, Witczak CA, Lowe DA, Neufer PD, Spangenburg EE. Estrogen receptor-α in female skeletal muscle is not required for regulation of muscle insulin sensitivity and mitochondrial regulation. ***Molecular Metabolism****. In Press*.
6. Verkerke ARP, Ferrara PJ, Lin C, Johnson JM, Ryan TE, Maschek JA, Eshima H, Paran CW, Laing BT, Siripoksup P, Tippetts TS, Wentzler EJ, Huang H, Spangenburg EE, Brault JJ, Villanueva CJ, Summers SA, Holland WL, Cox JE, Vance DE, Neufer PD, **Funai K**. Phospholipid methylation regulates muscle metabolic rate through Ca^{2+} transport efficiency. ***Nature Metabolism***. 1:876-885, 2019. Highlight: *Nature Metabolism*. 1:849-850, 2019. [Cover, Sept 2019]



7. 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 Bras 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**. Mitochondrial PE potentiates respiratory enzymes to amplify skeletal muscle aerobic capacity. ***Science Advances***. 5(9):eaax8352, 2019.
8. Park H, He A, Tan M, Johnson JM, Dean JM, Pietka TA, Chen Y, Zhang X, Hsu FF, Razani B, **Funai K**, Lodhi IJ. Peroxisome-derived lipids regulate adipose thermogenesis by mediating cold-induced mitochondrial fission. ***J Clin Invest****.* 129(2):694-711, 2019.
9. Pennington ER, **Funai K**, Brown DA, Shaikh SR. The role of cardiolipin concentration and acyl-chain composition on mitochondrial inner membrane molecular organization and function. ***Biochim Biophys Acta****.* 1864(7):1039-1052, 2019.
10. Gumucio JP, Qasawa A, Ferrara PJ, **Funai K**, McDonagh B, Mendias CL. Reduced mitochondrial lipid oxidation leads to fat accumulation in myosteatosis. ***FASEB J****.* 33(7):7863-7881, 2019.

11. Ferhat M, **Funai K**, Boudina S. Autophagy in adipose tissue physiology and pathophysiology. ***Antioxid Redox Signal***. 31(6):487-501, 2019.
12. Anderson EJ, Vistoli G, Katunga, LA, **Funai K**, Regazzoni L, Monroe TB, Gilardoni E, Cannizzaro L, Colzani M, De Maddis D, Rossoni G, Canevotti R, Gagilardi S, Carini M, Aldini G. A carnosine analog mitigates metabolic disorders of obesity by reducing carbonyl stress. ***J Clin Invest***. 128(12):5280-5293, 2018. Highlight: *J Clin Invest*. 128(12):5198-5200, 2018.
13. Johnson JM, Ferrara PJ, Verkerke ARP, Coleman CB, Wentzler EJ, Neufer PD, Kew KA, de Castro Brás LE, **Funai K**. Targeted overexpression of catalase to mitochondria does not prevent cardioskeletal myopathy in Barth syndrome. ***J Mol Cell Cardiol***. 121(8):94-102, 2018.
14. Ferrara PJ, Verkerke ARP, Brault JJ, **Funai K**. Hypothermia decreases oxygen cost for ex vivo contraction in mouse skeletal muscle. ***Med Sci Sports Exerc***. 50(10):2015-2023, 2018.
15. Heden TD, Ryan TE, Ferrara PJ, Hickner RC, Brophy PM, Neufer PD, McClung JM, **Funai K**. Greater oxidative capacity in primary myotubes from endurance trained women. ***Med Sci Sports Exerc***. 49(11):2151-2157, 2017. Highlight: *Med Sci Sports Exerc.* 49(11), News & Views.
16. Heden TD, Neufer PD, **Funai K**. Looking beyond structure: membrane phospholipids of skeletal muscle mitochondria. ***Trends Endocrinol Metab***. 27(8):553-62, 2016.
17. **Funai K**, Lodhi IJ, Spears LD, Yin L, Song H, Klein S, Semenkovich CF. Skeletal muscle phospholipid metabolism regulates insulin sensitivity and contractile function. ***Diabetes***. 65(2):358-70, 2016.
18. Paran CW, Zou K, Ferrara PJ, Song H, Turk J, **Funai K**. Lipogenesis mitigates dysregulated sarcoplasmic reticulum calcium uptake in muscular dystrophy. ***Biochim Biophys Acta***. 1852(12): 1530-1538, 2015. Highlight: *Muscular Dystrophy News*, September 16, 2015.
19. Paran CW, Verkerke ARP, Heden TD, Park S, Zou K, Lawson HA, Song H, Turk J, Houmard JA, **Funai K**. Reduced efficiency of sarcolipin-dependent respiration in myocytes from humans with severe obesity. ***Obesity***. 23(7): 1440-1449, 2015.
20. Oh J, Riek AE, Darwech I, **Funai K**, Shao J, Chin K, Sierra OL, Carmeliet G, Ostlund RE, Bernal-Mizrachi C. Deletion of macrophage vitamin D receptor promotes insulin resistance and monocyte cholesterol transport to accelerate atherosclerosis in mice. ***Cell Rep***. 10(11): 1872-1886, 2015.
21. Ridaura VK, Faith JJ, Rey FE, Cheng J, Duncan AE, Kau AL, Griffin NW, Lombard V, Henrissat B, Bain JR, Muehlbauer MJ, Ilkayeva O, Semenkovich CF, **Funai K**, Hayashi DK, Lyle BJ, Martini MC, Ursell LK, Clemente JC, Van Treuren W, Walters WA, Knight R, Newgard CB, Heath AC, Gordon JI. Gut microbiota from twins discordant for obesity modulate metabolism in mice. ***Science***. 341(6150): 1241214, 2013. Highlight: *Science*, 341(6150): 1069-1070, 2013.
22. **Funai K**, Song H, Yin L, Lodhi IJ, Wei X, Yoshino, J, Coleman T, Semenkovich CF. Muscle lipogenesis balances insulin sensitivity and strength through calcium signaling. ***J Clin Invest***. 123(3):1229-1240, 2013.
23. Jensen-Urstad APL, Song H, Lodhi IJ, **Funai K**, Yin L, Coleman T, Semenkovich CF. Nutrient-dependent phosphorylation channels lipid synthesis to regulate PPARα. ***J Lipid Res***. 54(7):1848-1859, 2013.
24. Lodhi IJ, Yin L, Jensen-Urstad APL, **Funai K**, Coleman T, Baird JH, El Ramahi MK, Razani B, Song H, Fu-Hsu F, Turk J, Semenkovich CF. Inhibiting adipose tissue lipogenesis reprograms thermogenesis and PPARγ activation to decrease diet-induced obesity. ***Cell Metab***. 16(2):189-201, 2012. Highlight: *Washington University in St. Louis Newsroom,* August 2, 2012.
25. **Funai K**, Semenkovich CF. Skeletal muscle lipid flux: running water carries no poison. ***Am J Physiol Endo Metab***. 301(2):E245-251, 2011.
26. Schweitzer GG, Castorena CM, Hamada T, **Funai K**, Arias EB, Cartee GD. The B_2 receptor of bradykinin is not essential for the increase in glucose uptake by insulin-stimulated mouse skeletal muscle. ***Physiol Res***. 60(3):511-519, 2011.
27. **Funai K**, Schweitzer GG, Castorena CM, Kanzaki M, Cartee GD. In vivo exercise followed by in vitro contraction additively elevates subsequent insulin-stimulated glucose transport by rat skeletal muscle. ***Am J Physiol Endo Metab***. 298(5):E999-1010, 2010.
28. Cartee GD, **Funai K**. Exercise and insulin: Convergence or divergence at AS160 and TBC1D1? ***Exerc Sport Sci Rev***. 37(4): 188-195, 2009. Highlight: *Exerc Sport Sci Rev.* 37(4): 156, 2009.
29. **Funai K**, Schweitzer GG, Sharma N, Kanzaki M, Cartee GD. Increased AS160 phosphorylation, but not TBC1D1 phosphorylation, with increased post-exercise insulin sensitivity in rat skeletal muscle. ***Am J Physiol Endo Metab***. 297(1):E242-251, 2009.

30. **Funai K**, Cartee GD. Inhibition of contraction-stimulated activation of AMP-activated protein kinase inhibits contraction-stimulated increases in glucose transport and PAS-TBC1D1 without altering PAS-AS160 in rat skeletal muscle. ***Diabetes****.* 58(5):1096-1104, 2009. Highlight: *University of Michigan News,* March 18, 2009.
31. Blair DR, **Funai K**, Schweitzer GG, Cartee GD. A type II myosin ATPase inhibitor reduces contraction-stimulated glucose transport in rat skeletal muscle. ***Am J Physiol Endo Metab****.* 296(5):E993-1002, 2009. Highlight: *Am J Physiol Endo Metab.* 296(5): E965-966, 2009.
32. **Funai K**, Cartee GD. Contraction-stimulated glucose transport in rat skeletal muscle is sustained despite reversal of increased PAS-phosphorylation of AS160 and TBC1D1*.* ***J Appl Physiol****.* 105(6):1788-1795, 2008.
33. Arias EB, Kim J, **Funai K**, Cartee GD. Prior exercise increases phosphorylation of Akt substrate of 160kDa (AS160) in rat skeletal muscle. ***Am J Physiol Endo Metab****.* 292(4):E1191-200, 2007.
34. **Funai K**, Parkington JD, Carambula S, Fielding RA. Age associated decrease in contraction-induced activation of downstream targets of Akt/mTOR signaling in skeletal muscle. ***Am J Physiol Regul Integr Comp Physiol***. 290(4):R1080-R1086, 2006.

35. Ferrara PJ, Rong X, Maschek JA, Verkerke ARP, Heden TD, Siripoksup P, Song H, Krishnan KC, Turk J, Houmard JA, Lusis AJ, Cox JE, Shaikh SR, Tontonoz P, **Funai K**. The Lands cycle modulates plasma membrane microdomain clustering and insulin sensitivity in skeletal muscle. *In Review.*
36. Eshima H, Siripoksup P, Mahmassani ZS, Johnson JM, Ferrara PJ, Verkerke ARP, Salcedo A, Drummond MJ, **Funai K**. Neutralizing mitochondrial ROS does not rescue muscle atrophy induced by hindlimb unloading in female mice. *In Review*.
37. Eshima H, Tamura Y, Kakehi S, Kakigi R, Hashimoto R, **Funai K**, Kawamori R, Watada H. Chronic high-fat diet exacerbates contractile dysfunction with impaired intracellular Ca2+ release capacity in skeletal muscle of aged mice. *In Review*.
38. Reidy PT, **Funai K**, Drummond MJ. Modeling physical inactivity-induced muscle insulin resistance in rodents: challenges and solutions. *In Review*.
39. Hinkley JM, Morton AB, Mor A, Hyatt HW, Nguyen BL, Smuder AJ, Heden TD, Dubis GS, Zheng D, **Funai K**, Houmard JA, Levine S, Powers SK. Human and rodent angiotension II type 1 receptor abundance differs markedly between respiratory and locomotor skeletal muscles. *In Review*.
40. Macias-Velasco, JF, St. Pierre CL, Wayhart JP, Yin L, Spears LD, **Funai K**, Cheverud JM, Semenkovich CF, Lawson HA. Epistatic network associated with parent-of-origin effects on metabolic traits. *In Review*. *Pre-print: Biorxiv*

ABSTRACTS:

INVITED SPEAKER

1. **Funai K**. Mitochondrial PE potentiates respiratory enzymes to amplify skeletal muscle aerobic capacity. *International Conference on the Bioscience of Lipids*. Tokyo, Japan, 2019. *Symposium*.
2. **Funai K**. Mitochondrial membrane lipids and respiratory efficiency. *Lipoquality Symposium*. Yokohoma, Japan, 2019. *Oral presentation*.
3. **Funai K**. Phospholipid turnover and mitochondrial metabolism in skeletal muscle. *American Diabetes Association 78th Scientific Sessions*. Orlando, FL, 2018. *Symposium*.
4. **Funai K**. Obesity modulates insulin signaling and lipidome in human primary myotubes. *Advances in Skeletal Muscle Biology in Health and Disease.* Gainesville, FL, 2014. *Oral presentation.*
5. **Funai K**. Skeletal muscle fatty acid synthase modulates sarcoplasmic reticulum phospholipid composition to regulate insulin sensitivity and muscle strength. The Physiologist 55(6): 33.5. *The Integrative Biology of Exercise VI*. Westminster, CO, 2012. *Symposium.*
6. **Funai K**, Yin L, Coleman T, Song H, Lodhi IJ, Semenkovich CF. De novo lipogenesis in skeletal muscle promotes insulin resistance. Diabetes. 61(Suppl 1): A28. *American Diabetes Association 72nd Scientific Sessions.* Philadelphia, PA, 2012. *Oral presentation.*
7. **Funai K**, Cartee GD. Roles of AMPK, CaMKII and Akt in contraction-stimulated AS160 phosphorylation in isolated rat skeletal muscle. Med Sci Sports Exerc. 40(5) (Suppl 1): S37. *American College of Sports Medicine 55th Annual Meeting.* Indianapolis IN, 2008. *Oral presentation.*

POSTERS

8. Lang MJ, Patil MH, Poss AM, Maschek JA, Siripoksup P, Johnson JM, Tippetts TS, Gerhart-Hines Z, Cox JE, Summers SA, **Funai K**. Remodeling of mitochondrial membrane lipids in the progression of non-alcoholic fatty-liver disease. *Keystone Symposia: New Insights into the Biology of Exercise*, Keystone, CO, 2020.
9. Siripoksup P, Johnson JM, Lang MJ, Mahmassani ZS, Maschek JA, Heden TD, Cox JE, Drummond MJ, **Funai K**. Mitochondrial PE modulates respiratory efficiency in skeletal muscle. *Keystone Symposia: New Insights into the Biology of Exercise*, Keystone, CO, 2020.
10. Lang MJ, Patil MH, Poss AM, Maschek JA, Siripoksup P, Johnson JM, Tippetts TS, Gerhart-Hines Z, Cox JE, Summers SA, **Funai K**. Remodeling of mitochondrial membrane lipids in the progression of non-alcoholic fatty-liver disease. Washington University School of Medicine Diabetes Day, St. Louis, 2019.
11. Heden TD, Johnson JM, Ferrara PJ, Eshima H, Verkerke ARP, Siripoksup P, Reidy PT, de Castro Bras LE, Karner CM, Burant CF, Cox JE, Mashek DG, Kardon G, Zeczycki TN, Rutter J, Shaikh SR, Vance JE, Drummond MJ, Neufer PD, **Funai K**. Mitochondrial PE potentiates respiratory enzymes to amplify skeletal muscle aerobic capacity. *Cold Spring Harbor Meeting: Mechanisms of Metabolic Signaling*. Cold Spring Harbor, NY, 2019.
12. Ferrara PJ, Rong X, Maschek JA, Verkerke ARP, Eshima H, Siripoksup P, Heden TD, Turk J, Houmard JA, Cox JE, Shaikh SR, Tontonoz P, **Funai K**. Lands cycle modulates plasma membrane microdomain clustering and insulin sensitivity in skeletal muscle. *Cold Spring Harbor Meeting: Mechanisms of Metabolic Signaling*. Cold Spring Harbor, NY, 2019.
13. Heden TD, Johnson JM, Ferrara PJ, Eshima H, Verkerke ARP, Siripoksup P, Reidy PT, de Castro Bras LE, Karner CM, Burant CF, Cox JE, Mashek DG, Kardon G, Zeczycki TN, Shaikh SR, Vance JE, Drummond MJ, Neufer PD, **Funai K**. Mitochondrial PE potentiates respiratory enzymes to amplify skeletal muscle aerobic capacity. *Gordon Conference on Mitochondria in Health and Disease*. Ventura, CA, 2019.
14. Mahmassani ZS, McKenzie AI, Matthews O, Petrocelli JJ, Reidy PT, Ferrara PJ, **Funai K**, Drummond MJ. Muscle-specific MyD88-/- protects from disuse-induced fat hypertrophy and impaired glucose uptake. *Advances in Skeletal Muscle Biology in Health and Disease*. Gainesville, FL, 2019.
15. Verkerke ARP, Ferrara PJ, Lin CT, Johnson JM, Ryan TE, Maschek JA, Laing BT, Huang H, Cox JE, Vance DE, Neufer PD, **Funai K**. Phospholipid methylation in muscle regulates metabolic rate and alters susceptibility for obesity. *Keystone Symposia: Obesity and Adipose Tissue.* Banff, Alberta, Canada, 2019.
16. Johnson JM, Heden TD, Ferrara PJ, Eshima H, Verkerke ARP, Siripoksup P, Lin CT, Ryan TE, Reidy PT, Maschek JA, Cox JE, Vance JE, Drummond MJ, Neufer PD, **Funai K**. Disuse vs. exercise: Phosphdatidylethanolamine in skeletal muscle mitochondrial adaptations. *Keystone Symposia: Mitochondrial Biology in Heart and Skeletal Muscle*. Keystone, CO, 2019.
17. Eshima H, Siripoksup P, Mahmassani Z, Verkerke ARP, Ferrara PJ, Johnson JM, Ran Q, Anderson EJ, Drummond MJ, **Funai K**. Lipid aldehydes exacerbate disuse-induced atrophy in mouse skeletal muscle. *Keystone Symposia: Mitochondria in Aging and Age-Related Disease*. Keystone, CO, 2019.
18. Ferrara PJ, Verkerke ARP, Johnson JM, Eshima H, Shaikh SR, **Funai K**. Alteration of plasma membrane phospholipid composition increases insulin signaling and microdomain clustering in skeletal muscle. *Integrative Physiology of Exercise*. San Diego, CA, 2018.
19. Ferrara PJ, Verkerke ARP, Brault JJ, **Funai K**. Lower temperature reduces oxygen cost for contractile activity in isolated mouse skeletal muscle. *Integrative Physiology of Exercise*. San Diego, CA, 2018. #30.
20. Eshima H, Tamura Y, Kakigi R, Hashimoto R, Kawamori R, **Funai K**, Watada H. Effects of high-fat diet induced obesity on contractile function and intracellular Ca^{2+} release in skeletal muscle of aged mice. *Integrative Physiology of Exercise*. San Diego, CA, 2018. #48.
21. Gumucio JP, Funai K, McDonaugh B, Mendias CL. Defective mitochondrial lipid oxidation results in the pathological accumulation of fat after rotator cuff tear. *8th World Congress of Biomechanics*. Dublin, Ireland.
22. Johnson JM, Ferrara PJ, Verkerke ARP, Coleman CV, Wentzler EJ, **Funai K**. Overexpression of catalase ameliorates oxidative stress but fails to prevent cardiomyopathy in a murine model of Barth Syndrome. *Keystone Symposia: Bioenergetics and Metabolic Disease*. Keystone, CO, 2018.
23. Spears LD, Razani B, **Funai K**, Feng C, Song H, Semenkovich CF. Lipogenesis regulates the response of cardiac muscle to ischemic stress through sarcoplasmic reticulum calcium ATPase. *Arteriosclerosis, Thrombosis, and Vascular Biology*, 37(Suppl 1): A539. Minneapolis, MN, 2017.

24. Inigo MMR, Jones KG, Heden TD, **Funai K**, Spangenburg EE. Knockdown of estrogen receptor-α in human myotubes from healthy or obese-insulin resistant women decreases mitochondrial respiration and ATP production rates. *American Diabetes Association 77th Scientific Sessions*. San Diego, CA, 2017. 1986P.
25. Johnson JM, Verkerke ARP, Heden TD, Strong SR, Narowski TM, Balotti AH, Renegar RH, Lin C, **Funai K**. Mitochondrial phosphatidylcholine flux is essential for proton uncoupling, cristae formation, and thermogenesis in brown adipose tissue. *Keystone Symposia: Diabetes/Obesity and Adipose Tissue Biology*. Keystone, CO, 2017.
26. Heden TD, Ferrara PJ, Verkerke ARP, Coleman C, Wentzler EJ, Narowski TM, Renegar RH, Brault JJ, **Funai K**. Muscle mitochondrial phosphatidylethanolamine synthesis is required for optimal muscle function and insulin sensitivity. *Keystone Symposia: Diabetes/Obesity and Adipose Tissue Biology*. Keystone, CO, 2017.
27. Ferrara PJ, Heden TD, Sullivan EM, Shaikh SR, Houmard JA, **Funai K**. Lysophospholipid metabolism as a potential mediator for the pathogenesis of skeletal muscle insulin resistance. *Keystone Symposia: Diabetes/Obesity and Adipose Tissue Biology*. Keystone, CO, 2017.
28. Verkerke ARP, Ferrara PJ, Lin C, Heden TD, Ryan TE, Wentzler EJ, Balotti AH, Neufer PD, **Funai K**. Muscle phospholipid methylation modulates SERCA energy efficiency and alters susceptibility for obesity. *Keystone Symposia: Diabetes/Obesity and Adipose Tissue Biology*. Keystone, CO, 2017.
29. Heden TD, Wentzler EJ, Narowski TM, Renegar RH, Brault JJ, **Funai K**. Absence of mitochondrial phosphatidylethanolamine synthesis impairs skeletal muscle respiration and promotes rapid death. *The Integrative Biology of Exercise VII*. Phoenix, AZ, 2016.
30. Ferrara PJ, **Funai K**. Inhibition of LPCAT3 enhances insulin signaling and decreases PPARγ transcriptional activity in skeletal muscle. *The Integrative Biology of Exercise VII*. Phoenix, AZ, 2016.
31. Johnson JM, Heden TD, Balotti AH, Wentzler EJ, Narowski TM, **Funai K**. Overexpression of skeletal muscle phosphatidylserine decarboxylase increases respiratory capacity and attenuates H_2O_2 production in tafazzin deficiency. *The Integrative Biology of Exercise VII*. Phoenix, AZ, 2016.
32. Verkerke ARP, Ferrara PJ, Lin C, Heden TD, Ryan TE, Wentzler EJ, Balotti AH, Neufer PD, **Funai K**. Absence of phosphatidylethanolamine methylation increases skeletal muscle energy expenditure and prevents obesity. *The Integrative Biology of Exercise VII*. Phoenix, AZ, 2016.
33. Ferrara PJ, Verkerke ARP, Balotti AH, Narowski TM, Spangenburg EE, **Funai K**. A novel method to quantify resting and contraction-stimulated O_2 consumption in isolated mouse skeletal muscle. *The Integrative Biology of Exercise VII*. Phoenix, AZ, 2016.
34. Johnson JM, Verkerke ARP, Heden TD, Narowski TM, Balotti AH, Strong SR, Lin C, **Funai K**. Phosphatidylethanolamine methyltransferase is required for mitochondrial uncoupling and cardiolipin content in brown adipose tissue. *The Integrative Biology of Exercise VII*. Phoenix, AZ, 2016.
35. Ferrara PJ, Wentzler EJ, Verkerke ARP, Narowski TM, Balotti, AH, **Funai K**. Overexpression of skeletal muscle phosphatidylethanolamine methyltransferase does not affect whole body metabolism in mice. *The Integrative Biology of Exercise VII*. Phoenix, AZ, 2016.
36. Johnson JM, Heden TD, Wentzler EJ, Narowski TM, **Funai K**. Local phosphatidylethanolamine synthesis mediates exercise-induced remodeling of skeletal muscle mitochondria. *American Diabetes Association 76th Scientific Sessions*. New Orleans, LA, 2016. 279-LB.
37. Verkerke ARP, Johnson JM, Ferrara PJ, Lin C, Heden TD, Wentzler EJ, Narowski TM, Neufer PD, **Funai K**. Phospholipid methylation deficiency increases skeletal muscle energy expenditure and prevents obesity. *American Diabetes Association 76th Scientific Sessions*. New Orleans, LA, 2016. 278-LB.
38. Strong SR, Verkerke ARP, Johnson JM, Wentzler EJ, **Funai K**. Ablation of phosphatidylethanolamine methyltransferase promotes incomplete thermogenic reprogramming in white adipose tissue. *Annual Meeting for Experimental Biology.* San Diego, CA, 2016. W209.
39. Heden TD, **Funai K**. Phosphatidylserine decarboxylase regulates skeletal muscle respiration by its action on Complex II. *Advances in Skeletal Muscle Biology in Health and Disease.* Gainesville, FL, 2016.
40. Verkerke ARP, Johnson JM, Lin CT, Ryan TE, Ferrara PJ, Heden TD, Wentzler EJ, Neufer PD, **Funai K**. Mitochondrial uncoupling-independent increase in muscle respiration likely mediates anti-obesogenic phenotype of phosphatidylethanolamine methyltransferase null mice. *Advances in Skeletal Muscle Biology in Health and Disease.* Gainesville, FL, 2016.

41. Ferrara PJ, Paran CW, Song H, Turk J, **Funai K**. Lipidomic analyses of human skeletal muscle reveals LPCAT3 as a potential mediator of insulin resistance. *Advances in Skeletal Muscle Biology in Health and Disease.* Gainesville, FL, 2016.
42. Verkerke ARP, Paran CW, Atkinson JE, **Funai K**. Increased energy expenditure and insulin sensitivity, but not protection from obesity in phosphatidylethanolamine methyltransferase knockout mice on long-term high-fat diet feeding. *FASEB J.* 29(Suppl 1): 824.5. *Annual Meeting for Experimental Biology.* Boston, MA, 2015.
43. Ferrara PJ, Heden TD, Paran CW, Park S, Houmard JA, **Funai K**. Alteration of skeletal muscle lysophospholipid metabolism in mouse and human obesity. *FASEB J.* 29(Suppl 1): 824.6. *Annual Meeting for Experimental Biology.* Boston, MA, 2015.
44. Verkerke ARP, Paran CW, Heden TD, Park S, Zou K, Lawson HA, Song H, Turk J, Houmard JA, **Funai K**. Reduced efficiency of sarcolipin-dependent respiration in myocytes from severely obese humans. *Keystone Symposia: Systems Biology of Lipid Metabolism.* Breckenridge, CO, 2015.
45. **Funai K**, Lodhi IJ, Spears LD, Yin L, Song H, Coleman T, Klein S, Semenkovich CF. Muscle phospholipid synthesis regulates insulin sensitivity and contractile function. *Diabetes*. 63(Suppl 1): A476-477. *American Diabetes Association 74th Scientific Sessions.* San Francisco, CA, 2014.
46. Paran CW, Park S, Song H, Houmard JA, Dohm GL, Lawson HA, Turk J, **Funai K**. Obesity modulates insulin signaling and lipidome in human primary myotubes. *Advances in Skeletal Muscle Biology in Health and Disease.* Gainesville, FL, 2014.
47. Huang T, Zheng D, Muller-Borer B, Collins M, Noland RC, **Funai K**, Hickner RC, Cortright RN. Peroxisomal biogenesis occurs in response to obesity and to a high lipid environment in human skeletal muscle. *FASEB J*. 28(Suppl 1): 1159.5. *Annual Meeting for Experimental Biology.* San Diego, CA, 2014.
48. **Funai K**, Song H, Yin L, Lodhi IJ, Wei X, Yoshino, J, Coleman T, Semenkovich CF. Muscle lipogenesis balances insulin sensitivity and strength through calcium signaling. *Kern Lipid Conference.* Vail, CO, 2013.
49. Lodhi IJ, Yin L, **Funai K**, Jensen-Urstad APL, Coleman T, Turk J, Semenkovich CF. Peroxisomal lipid synthesis programs adipose tissue development through PPAR signaling. *Keystone Symposia: Adipose Tissue Biology.* Keystone, CO, 2013. J5-2033.
50. **Funai K**, Song H, Wei X, Lodhi, IJ, Semenkovich CF. Skeletal muscle fatty acid synthase modulates sarcoplasmic reticulum phospholipid composition to regulate insulin sensitivity and muscle strength. The Physiologist 55(6): 21.3. *The Integrative Biology of Exercise VI*. Westminster, CO, 2012.
51. **Funai K**, Schweitzer GG, Sharma N, Kanzaki M, Cartee GD. TBC1D1 phosphorylation and insulin-independent glucose transport are increased immediately post-exercise in rat skeletal muscle, but TBC1D1 phosphorylation is reversed at 3h post-exercise when insulin sensitivity is increased. *American Diabetes Association 69th Scientific Sessions.* New Orleans, LA, 2009. 34-LB.
52. **Funai K**, Malo KM, Schweitzer GG, Sharma N, Kanzaki M, Cartee GD. Increased AS160 phosphorylation, but not TBC1D1 phosphorylation with increased post-exercise insulin sensitivity in rat skeletal muscle. *Exercise in the Management and Prevention of Metabolic Disease*. Stockholm, Sweden, 2009.
53. **Funai K**, Schweitzer GG, Cartee GD. Evidence for a consistent association between the effects of prior exercise on AS160 phosphorylation and insulin-stimulated glucose transport in rat skeletal muscle. *American Diabetes Association 68th Scientific Sessions.* San Francisco, CA, 2008. 27-LB.
54. **Funai K**, MacKrell JG and Cartee GD. Inhibition of contraction-stimulated activation of AMPK partially inhibits the contraction-stimulated increase in glucose transport and PAS-150kD without altering PAS-160kD in rat skeletal muscle. *American Diabetes Association 68th Scientific Sessions.* San Francisco, CA, 2008. 28-LB.
55. Schweitzer GG, Castorena CM, Hamada T, Arias EB, **Funai K**, Cartee GD. The B_2 receptor of bradykinin is not essential for the increase in insulin-stimulated glucose uptake following acute exercise. *American Diabetes Association 68th Scientific Sessions.* San Francisco, CA, 2008. 29-LB.
56. Blair DR, Arias EB, **Funai K**, Cartee GD. A type II myosin ATPase inhibitor reduces contraction-stimulated glucose transport in rat skeletal muscle. Med Sci Sports Exerc. 40(5) (Suppl 1): S37. *American College of Sports Medicine 55th Annual Meeting.* Indianapolis IN, 2008.
57. **Funai K**, Cartee GD. Contraction-stimulated phosphorylation of AS160 is temporally coupled with phosphorylation of CaMKII, but not AMPK or Akt. *American Diabetes Association 67th Scientific Sessions.* Chicago, IL, 2007. 24-LB.

58. Cartee GD, Arias EB, Wilke JC, Herlich ND, **Funai K**, Blair DR, Prolla TA, Weindruch R. Resveratrol supplemented diet induces increased glucose uptake by skeletal muscle. *Xth International Symposium on Insulin Receptors and Insulin Action.* Stockholm, Sweden, 2007.
59. **Funai K**, Kim J, Arias EB, Cartee GD. Effects of prior exercise on insulin stimulated phosphorylation of AS160 and glucose transport in rat skeletal muscle. Med Sci Sports Exerc. 38(11) (Suppl 1): S8. *Integrative Physiology of Exercise.* Indianapolis IN, 2006.
60. **Funai K**, Parkington JD, Carambula S, Fielding RA. Age associated decrease in contraction-induced eIF4E-4G complex formation in skeletal muscle. *58th Annual Scientific Meeting of Gerontological Society of America.* Orlando, FL, 2005. #1391.

INVITED SEMINARS:

1. Three Sisters Paradox: why mammalian cells lack yeast Cho1. *Research in Progress Meeting, Diabetes & Metabolism Research Center*, University of Utah
2. Mitochondrial PE potentiates respiratory enzymes to amplify skeletal muscle aerobic capacity. *Utah Vascular Research Laboratory Seminar*, University of Utah
3. Use it or Lose it: Energy efficiency of mitochondria, *Vitae 2019*, University of Utah
4. Mitochondrial membrane lipids regulate metabolic efficiency. *Department of Biochemistry & Molecular Biology*. Saint Louis University School of Medicine. St. Louis, MO. 2019.
5. Mitochondrial membrane remodeling induced by exercise and inactivity. *ARIHHP Seminar*. University of Tsukuba, Tsukuba, Japan. 2019.
6. How to build a wall: Mitochondrial PE potentiates respiratory enzymes to amplify skeletal muscle aerobic capacity. *Orthopedic Soft Tissue Research Program*. Hospital for Special Surgery. New York City, NY. 2019.
7. How to build a wall –especially *if one is a large cell-. *Department of Chemistry & Biochemistry Seminar*. Brigham Young University, Provo, UT. 2019.
8. Mitochondrial PE potentiates respiratory enzymes to amplify skeletal muscle aerobic capacity. *Department of Biological Sciences Seminar.* Texas Tech University. Lubbock, TX. 2019.
9. Lands cycle and skeletal muscle insulin action. *Driving Out Diabetes Initiative Retreat*. University of Utah. Salt Lake City, UT. 2018.
10. Phospholipid turnover in skeletal muscle mitochondria. *Japan Ministry of Education, Culture, Sports, Science and Technology, Waseda University Department of Sports Science Seminar.* Waseda University. Tokorozawa, Japan.
11. Acute mitochondrial PE deficiency promotes respiratory failure. *Metabolism Research in Progress Meeting.* Diabetes & Metabolism Research Center, University of Utah. Salt Lake City, UT. 2018.
12. Phospholipid origin of mitochondrial myopathy. *Department of Cellular and Integrative Physiology.* University of Texas Health Science Center in San Antonio. San Antonio, TX. 2018.
13. Phospholipid origin of mitochondrial myopathy. *Molecular and Cell Biology of Lipids Group.* University of Alberta. Edmonton, AB, Canada. 2018.
14. Phospholipid origin of mitochondrial myopathy. *Molecular Medicine Program.* University of Utah. Salt Lake City, UT. 2018.
15. Phospholipid methylation regulates skeletal muscle energy expenditure. *Department of Nutritional Science*. Brigham Young University. Provo, UT. 2018.
16. Phospholipid-dependent energy uncoupling of skeletal muscle SERCA pump. *Department of Orthopedic Surgery.* University of California, San Diego. San Diego, CA. 2017.
17. Phospholipid methylation regulates skeletal muscle energy expenditure. *School of Kinesiology*. University of Michigan. Ann Arbor, MI. 2017.
18. PE methylation regulates skeletal muscle energy efficiency. *Department of Physical Therapy*. University of Utah. Salt Lake City, UT. 2017.
19. Lysophospholipid metabolism as a potential mediator for the pathogenesis of skeletal muscle insulin resistance. *Department of Pathology.* University of California Los Angeles. Los Angeles, CA. 2017.
20. Displacing functional deficits of nascent cardiolipin with phosphatidylethanolamine. *Human Performance Laboratory Seminar Series*. East Carolina University. Greenville, NC. 2016.
21. In search of the carbonized bamboo for cell's engine. *East Carolina Diabetes and Obesity Institute Metabolism Seminar*. East Carolina University. Greenville, NC. 2016.

22. Juggling mice and kids and love them both. *College of Health and Human Performance Faculty Development Seminar Series*. East Carolina University. Greenville, NC. 2016.
23. Effects of temperature on skeletal muscle energy efficiency. *Department of Kinesiology Seminars*. East Carolina University. Greenville, NC, 2016.
24. Phospholipid-dependent energy uncoupling of skeletal muscle SERCA pump. *Skeletal Muscle Metabolism Seminar*, Pennington Biomedical Research Center. Baton Rouge, LA. 2016.
25. Parabiosis as a tool to understand metabolism, *Department of Comparative Medicine Seminar Series*, East Carolina University. Greenville, NC. 2016.
26. Phospholipid-dependent energy uncoupling of skeletal muscle SERCA pump. *Department of Pharmacology and Toxicology Seminar*. East Carolina University. Greenville, NC. 2015.
27. Aberrant muscle lipidome in human obesity. *Human Performance Laboratory Seminar Series*. East Carolina University. Greenville, NC. 2015.
28. Skeletal muscle energy inefficiency as a target to treat obesity. *Department of Kinesiology Seminars.* East Carolina University. Greenville, NC. 2015.
29. A report from NIDDK workshop. *Human Performance Laboratory Seminar Series.* East Carolina University. Greenville, NC. 2015.
30. PE methylation and muscle energy efficiency. *Mouse Interest Group Seminar Series.* East Carolina University. Greenville, NC. 2014.
31. Mouse metabolic phenotyping. *Department of Comparative Medicine Seminar Series.* East Carolina University. Greenville, NC. 2014.
32. Metabolic syndrome and muscle lipid overload. *Department of Kinesiology Seminars.* East Carolina University. Greenville, NC. 2014.
33. Skeletal muscle phospholipid biosynthesis & insulin sensitivity. *Department of Biomedical Engineering Seminar.* Tohoku University, Sendai, Japan. 2014.
34. Muscle phosphatidylethanolamine synthesis maintains sarcoplasmic reticulum integrity to regulate contractile function and insulin sensitivity. *College of Sport Sciences Seminar.* Waseda University, Saitama, Japan. 2014.
35. Comparative analyses of higher educations in United States and Japan: pros and cons for studying abroad. *Ministry of Education, Culture, Sports, Science and Technology*, Tokyo, Japan. 2014.
36. Obesity metabolic programming in human primary myotubes. *East Carolina Diabetes and Obesity Institute Metabolism Seminar.* East Carolina University, Greenville, NC. 2014.
37. The SR stress. *East Carolina Diabetes and Obesity Institute Seminar*. East Carolina University. Greenville, NC. 2013.
38. Utilizing Lipidomic Technology to Understand Metabolism. *Department of Kinesiology Seminars.* Greenville, NC. 2013.
39. Muscle de novo lipogenesis modulates SR phospholipid composition to regulate insulin sensitivity and muscle strength. *Division of Endocrinology and Metabolism Seminar.* University of Wisconsin-Madison. Madison, WI. 2013.
40. Muscle de novo lipogenesis modulates SR phospholipid composition to regulate insulin sensitivity and muscle strength. *Department of Nutrition and Metabolism Seminar.* University of Texas Medical Branch. Galveston, TX. 2013.
41. Muscle de novo lipogenesis modulates SR phospholipid composition to regulate insulin sensitivity and muscle strength. *Diabetes and Obesity Institute Seminar.* East Carolina University. Greenville, NC. 2013.
42. Muscle de novo lipogenesis modulates SR phospholipid composition to regulate insulin sensitivity and muscle strength. *Department of Kinesiology Seminar.* University of Illinois-Urbana Champaign. Urbana, IL. 2012.
43. More than just a fuel. Skeletal muscle lipid signaling processes. *Department of Kinesiology Seminar.* University of Wisconsin-Madison. Madison, WI. 2012.
44. When muscle cannot make its own fat. Skeletal muscle de novo lipogenesis contributes to the pathogenesis of insulin resistance. *Endocrinology Seminar.* Washington University School of Medicine, St. Louis, MO. 2012.
45. Skeletal muscle de novo lipogenesis & the glucose-fatty acid cycle. *Department of Physiology and Developmental Biology Seminar.* Brigham Young University. Provo, UT. 2011.

46. Mechanisms for exercise-stimulated enhancement of skeletal muscle substrate metabolism. *Muscle Metabolism Discovery Performance Unit Seminar.* GlaxoSmithKline. Research Triangle Park, NC. 2011.
47. Modulation of mitochondrial respiration in skeletal muscle. *Endocrinology Seminar.* Washington University School of Medicine, St. Louis, MO. 2011.
48. Effects of muscle contraction on the regulation of AS160, TBC1D1 and glucose transport. *Touchstone Diabetes Center Seminar.* University of Texas Southwestern. Dallas, TX. 2009.
49. Effects of muscle contraction on the regulation of AS160, TBC1D1 and glucose transport. *Diabetes and Obesity Research Center Seminar.* Burnham Institute at Lake Nona. Orlando, FL. 2009.
50. Effects of muscle contraction on the regulation of AS160, TBC1D1 and glucose transport. *Endocrinology Seminar.* Washington University School of Medicine. St. Louis, MO. 2009.
51. Roles of AMPK, CaMKII and Akt in contraction-stimulated AS160 phosphorylation in isolated rat skeletal muscle. *Center for Exercise Research Seminar.* University of Michigan. Ann Arbor, MI. 2008.
52. Effects of exercise, contractile activity and insulin on skeletal muscle Akt Substrate of 160 kDa (AS160). *Center for Exercise Research Seminar.* University of Michigan. Ann Arbor, MI. 2006.
53. Age-associated decrease in contraction-induced eIF4E-4G complex formation in skeletal muscle. *Center for Exercise Research Seminar.* University of Michigan. Ann Arbor, MI. 2005.