Christopher D. Hardin

Professor and Chair
Department of Nutrition and Exercise Physiology
- College of Human Environmental Sciences
- School of Medicine
- College of Agriculture, Food, and Natural Resources

204B Gwynn Hall
University of Missouri
Columbia, MO 65211

Contact Information:

Address: Department of Nutrition and Exercise Physiology
204 Gwynn Hall
University of Missouri
Columbia, MO 65211

Telephone: (573) 884-0183 (office)
email: hardinc@missouri.edu
Web page: http://ns.missouri.edu/index.html

Education:

1989	Ph.D.	University of Cincinnati, Physiology and Biophysics
1986	M.S.	University of Rochester, Physiology
1983	B.S.	Cornell University, Biology

Visions/Goals/Aspirations:

I developed an interest in administration a decade ago when, as a tenured School of Medicine faculty, I found myself drawn to campus-wide initiatives. I was enticed by my current chair position because it was configured to have a broad campus presence that provides insights into the cultures, budgets, missions, ambitions and constraints of a range of units across campus. Because of my administrative appointment in three colleges and extension, I developed a much deeper understanding of the inner workings of individual colleges and of how colleges can collaborate effectively. My passion for my current position compels me to selectively look for future opportunities that allow me to focus on larger campus issues and collaborations among colleges. All aspects of the academic enterprise appeal to me including undergraduate, graduate and professional training, research, outreach, economic development, and fund-raising. In a new position, I would like to utilize my experience to help foster increased collaboration within and across disciplines in teaching and research. I would like to enter a leadership role to strengthen existing academic and research programs and facilitate new programs focused on solving important problems impacting society. It is incumbent on universities to foster the perception and

the reality that universities are relevant to the concerns of the taxpayers. The public's perception of such relevance is essential to maintain public support of science, humanities, and social science funding. Universities should be seen as a unique force in the nation and the world where comprehensive arrays of disciplines can work together to solve the big problems facing humanity. Another way for a research intensive university to efficiently fulfill its missions is to increase the flexibility of administrative structures to allow faculty to "re-invent" themselves so they may continually stay productive, relevant and positively engaged. Administrative flexibility is also important to allow a university to respond to new big problems and to fiscal challenges. Rather than viewing this as a frightening and disheartening time in academia, I view this as one of the most exciting times in the modern era for the academy. This is an opportunity to envision a new way for a university to function – one that is more nimble, flexible and relevant to society. I want to play a key role in meeting these challenges.

Leadership Experience:

Chair, Department of Nutrition and Exercise Physiology (2007 to present). The Department of Nutrition and Exercise Physiology (NEP) was reconfigured in 2007 to be part of the School of Medicine (SOM), College of Human Environmental Sciences (HES), and the College of Agriculture, Food and Natural Resources (CAFNR). The chair reports directly to deans at least monthly and there are faculty/slots with tenure lines in each of the three colleges. NEP is highly collaborative, interdisciplinary and translational in its research. NEP researchers are primary users of the School of Medicine Clinical Research Center and of the Brain Imaging Center. NEP opened new research facilities in 2014 including the MU Nutritional Center for Health (MUNCH) and the MU Physical Activity and Wellness (MU PAW) facility which have dramatically increased our human research capacity.

Scope of Responsibilities:

Lead a department with 15 tenure line faculty/slots, 4 joint tenure line faculty/slots, and 5 teaching assistant/associate professors.

Manage a budget in multiple colleges totaling ~$2.5 million in recurring funds (excluding grants).

Direct four full time office staff.

Oversee three undergraduate programs (Nutritional Sciences, Nutrition and Fitness, Coordinated Program in Medical Dietetics) with a total of approximately 400 majors.

Oversee and evaluate instruction by department faculty of approximately 17,000 student credit hours per year.

Oversee two PhD programs and two MS programs (one new).

Oversee Nutrition Extension in the role of being the academic home of the extension faculty and state specialists and review campus extension faculty.

Notable Department Achievements:

Researched, developed the concept (white paper), designed the infrastructure, and oversaw the construction and opening of the MU-Nutritional Center for Health (MUNCH).

Department grant funding has more than doubled from 2007 to present.

Student credit hours taught in NEP more than doubled from 2007 to present.

Raised over $3.5 million in donations/pledges and support for the department (over $2.5 million in estate gifts and over $1 million in cash and for new and enhancing existing endowments).

Recruited seven tenured/tenure track faculty with primary NEP appointments since 2008 including use of Mizzou Advantage and Chancellor's Fund for Excellence funding resources. Recruited three new full time teaching assistant professors in 2014.

Directed the initiation of department on-line courses (none in 2007, eight courses in 2014) as well as five study abroad courses (one is co-directed by me).

Formation of the Corporate Advisory Board for NEP. This is Mizzou's first board where corporation and individuals pay an annual fee to participate in the board which brings together the triad of Food, Pharma and Fitness to discuss current and upcoming challenges. All revenues support the NEP graduate programs. Resulting from this initial November 2015 board meeting is a new grant from the Atkins foundation.

Notable Recent Campus Achievements

Search committee member for the Director of the Honors College in Spring 2015.

Led the Honors College diversity task force in the 2014/15 academic year.

Working with Dr. Raedeke, developed a new combined BS/MS RD program in Medical Dietetics. The new degree program has been approved by the Board of Curators and the Missouri Department of Higher Education and recently approved by the accrediting body ACEND).

School of Medicine Accreditation, mock site visit and site visit participant, author of sections on Research/Medical student research opportunities/Academic environment section, pressures for self-financing (LCME Standards 3 and 5) 2015/16.

Led the School of Medicine Research retreat task force on faculty recruiting to enhance AAU metrics and overall increased research productivity in the SOM and campus in 2013/14.

Led the Honors College strategic planning process over the course of the 2013/14 academic year.

Initiatives Underway:

Researched and developed the concept for the Lifestyle Intervention For Everyone (MU LIFE) center at McKee Gymnasium. MU-LIFE is actively being promoted for development and is in the process of being made part of the MU Master Plan.

Developing a new undergraduate major in Human Physiology and Translational Sciences as a partnership of the Department of Nutrition and Exercise Physiology and the Department of Medical Pharmacology and Physiology.

Developing, as the instructor, a new study abroad course (NS 3131) on Japanese Food and Culture in Nagano Prefecture. The course was successfully launched in May of 2016 working closely with the Nagano Prefectural Government.

Leadership Training and Development (given and received)

2016 Panelist, session for new chairs, University of Missouri Chair retreat.

2015 Invited participant in the department chair's workshop as part of the AAU Undergraduate STEM Initiative, Washington DC, 27-28 April.

2014 Executive Development Seminar for Associate Deans and Department Chairs. A 5 day workshop offered by the American Association of Medical Colleges, Tempe AZ.

2014- SEC Academic Leadership Development Program

2011 Faculty Mentoring Workshop, University of Missouri School of Medicine, 21 March 2011.

2010 "Development for Deans" 3 day training, Council for the Advancement and Support of Education (CASE), Nov 1-3, Chandler, AZ.

2010 "Media Training Workshop", CASE, Chandler AZ, Nov 3.

2007 Participant in the Leadership Development Program (part of the President's Academic Leadership Institute) through the University of Missouri System.

Appointments:

2007-present	Professor and Chair, Department of Nutrition and Exercise Physiology, School of Medicine, College of Human Environmental Sciences and College of Agriculture Food and Natural Resources, University of Missouri, Columbia, MO.
2005-present	Professor with tenure, Department of Medical Pharmacology and Physiology, University of Missouri, Columbia, MO.
2002-2005	Associate Professor with tenure, Department of Medical Pharmacology and Physiology, University of Missouri, Columbia, MO.
1999-2002	Associate Professor with tenure, Department of Physiology, University of Missouri, Columbia, MO.

1993-1999	Assistant Professor, Department of Physiology, University of Missouri, Columbia, MO.
1991-1993	Research Assistant Professor, Department of Radiology, University of Washington, Seattle.
1989-1991	Senior Fellow, Department of Radiology, University of Washington, Seattle

Awards, Honors:

Faculty

2013	Faculty Service and Leadership Award, Honors College, University of Missouri (Service Award)
2006	Inaugural Outstanding Undergraduate Mentor Award, Office of Undergraduate Research, University of Missouri (*Teaching Award*).
2005	Chancellor's Award for Research and Creative Activity, University of Missouri. *(Research Award*).
2002	Elected Fellow, Cardiovascular Section, American Physiological Society. (*Research Honor*).
2001	Charter Member, Order of Socrates, as recognition of master teachers repeatedly cited for excellence in teaching in the medical curriculum, University of Missouri School of Medicine. (*Teaching Honor*).
2000	Gold Chalk Award (outstanding service in the training and mentoring of graduate – professional students), Graduate Professional Council, University of Missouri. (*Teaching Award*).
1999	Recognized for Excellence in Medical Student Education, Office of Medical Education, University of Missouri. (*Teaching Honor*).
1999	Dorsett L. Spurgeon Distinguished Medical Research Award to the outstanding junior faculty member (clinical or basic science) in the School of Medicine at the University of Missouri - keynote address at the School of Medicine Research Day. (*Research Award*).
1995	Harold Lamport Award, given by the APS to the outstanding investigator in cardiovascular physiology under the age of 36 years (*Research Award*).

Trainee

1989-92	Individual National Research Service Award (NIH 1F32 AR 08104). (*Research Award*).
1986-88	Albert J. Ryan Foundation Fellow (*Research Award*).
1987	Jeffrey D. Doane Memorial Award (Univ. Cincinnati) (*Research Award*)

Service:

University Administrative and Committee Service:

Current Responsibilities:

2016-17	Chair, Campus Council of Chairs.
2016-17	Member, College of Human Environmental Sciences Diversity Task Force
2013 -	Member, School of Medicine Research Advisory Committee.
2011 -	Member, MU Faculty Advisory Committee on Intellectual Property.
2010 -	Member Food For The Future Advisory Board, Mizzou Advantage, University of Missouri.
2008 -	Member, MU-PREP Advisory Committee (NIH funded post-bac program for under-represented minorities in biomedical sciences).
1996 -	NMR Facility Committee, (Chair 2004-2007), University of Missouri.
1995 -	Member of the Doctoral Faculty, University of Missouri.
1994 -	Member of the Graduate Faculty, University of Missouri.

Past Responsibilities:

2011 16-	Member, Honors Council, oversight and advisory committee to the University of Missouri Honors College.
2015	Member, Honors College Director search committee.
2014-15	Chair, Honors College Diversity Committee.
2014-16	Member subcommittee for LCME accreditation standards 3 and 5, School of Medicine.
2011-15	Member, Honors College Science Sequence Committee, Honors College, University of Missouri.
2014	Member, search committee for the Mizzou Advantage Faculty Fellow.
2013	Leader, School of Medicine Research Retreat Task Force on Faculty Hiring.
2012-2013	Chair, Honors College Strategic Planning Committee.
2012-2013	Member, Department of biochemistry faculty search committee.
2011	Advisory Committee Member for the 2010-2011 Presidential Award for Excellence, Presidential Award for Economic Development, and Student Entrepreneur of the Year Award, University of Missouri System.
2011	Faculty Liaison for the College of Human Environmental Sciences for the It's My Mizzou Faculty & Staff campaign.
2011	Life Sciences and Society Symposium (2012) Planning Committee.

2009-2010	Member School of Medicine Equity Council; a committee to work to achieve increased enrollment, hiring, and retention of under-represented minorities.
2008-2010	Member, Advisory Board for Maps in Medicine, a precollege science education program funded by the Howard Hughes Medical Institute (HHMI).
2009	Member of the committee to determine the Chancellor's Award in Performing Arts and the Humanities and in Biological Sciences.
2008	Chair, search committee for Associate Dean for Research and Graduate Studies, College of Human Environmental Sciences.
2008-09, 11	Member, Planning Committee for the MU Life Sciences Week.
2007-2008	Chair, Campus Research Council, University of Missouri (member 2005-2008)
2007-2008	Member, Search Committee for Vice Chancellor for Research, University of Missouri.
2008	Chair, College of Human Environmental Sciences Campus Diversity Working Group.
2006-2013	Member of SPRAC (Strategic Planning & Resource Advisory Council) for the University of Missouri. http://chancellor.missouri.edu/planning/strategic-planning-resource-advisory-council/ .
2002-2007	Member, Institutional Review Board, Health Sciences Center.
2001-2007	Member, PRIME Fund Committee, University of Missouri.
2004-07, 12	Member, Life Sciences Undergraduate Research Opportunity Program Fellowship Committee, University of Missouri.
2002-2007	Member, Life Sciences Fellowship Committee, University of Missouri (Chair 2004-2007).
2007	University program review of the Division of Biological Sciences, review committee member.
2006	Member, Subcommittee for SPRAC (Strategic Planning & Resource Advisory Council) on Pursuit of Quality: Encouraging Creative Risk and Collaborative Activity. Chaired by the Vice Provost for Research.
2006	Member of the Awards Committee to determine the 2006 recipients of the Chancellor's Award for Research & Creativity in the Behavioral and Social Sciences, and also in the Mathematical and Physical Sciences, and also the Provost's Award for Junior Faculty Research and Creative Activity, University of Missouri.
2003-2004	Associate Director of Graduate Studies (recruitment), Department of Medical Pharmacology and Physiology.

2003	Reviewer of Nominees for the President's Award for Research and Creativity Intercampus Competition, University of Missouri.
2001	Head of the department strategic planning committee on undergraduate, graduate and post-doc education.
2001-2002	Member, Dean's ad hoc committee to evaluate roles and functions of faculty in education for mission-based management.
2000-2003	Co-Director of Graduate Studies, recruitment, Department of Physiology, University of Missouri.
1999	Department of Physics Faculty Search Committee for 2 positions in Biological Physics, University of Missouri.
1999-2002	Campus Committee on Faculty Responsibility, University of Missouri.
1999-2001	Organizing Committee for Cardiovascular Day, University of Missouri.
1999-2000	Member, Committee on Basic Science Departments for the MU Self-Study for the Liaison Committee on Medical Education (Accreditation).
1998	Member, Chancellor's Award for Research & Creativity in the Behavioral and Social Sciences Selection Committee, University of Missouri.
1996-1999	Member, Residential Life Committee, University of Missouri.
1997-1998	Member Integrated Technology Services (ITS) Basic Science Task Force, University of Missouri.
1996-1999	Member, School of Medicine Research Council, vice chair 1998-99, University of Missouri.
1994-2004	Member, Department of Physiology Graduate Admissions Committee, University of Missouri.
1994-1996	Seminar Coordinator, Dept. of Physiology, University of Missouri

***Professional Affiliations**:*

2007-	American Society for Nutrition
1990-	American Association for the Advancement of Science.
1986-	American Physiological Society.
1995-	American Heart Association, Scientific Council: Basic Science.
2006-2008	Metabolomics Society
1994-2002	International Society for Heart Research.
1986-2007	Biophysical Society.
1991-1992	Society for Magnetic Resonance in Medicine.
1987-1989	Ohio Physiological Society.

Professional Affiliation Service:

2017	Chair, Association of Nutrition Departments and Programs (ANDP)
2016	Chair elect, Association of Nutrition Departments and Programs (ANDP)
2013	Recruitment visit and seminar to University of Puerto Rico en Cayey, 9 April 2013
2012	Judge, Annual Biomedical Research Conference for Minority Students, San Jose, CA , November 2012
2007-2010	Steering Committee, Advanced Placement Annual Conference (APAC, via The College Board). The committee organizes the program as well as doing the evaluation of sessions.
2005-2008	Member, Industry-Foundations Liaison Committee of the Cardiovascular Section of the American Physiological Society (Chair 2007-2008)
2007-2008	Member, Cardiovascular Section Steering Committee of the American Physiological Society.
2005-2007	Member, Awards Committee, American Physiological Society.
2004-2006	Member, Council of the Gordon Research Conferences

Teaching Related Activities:

Teaching

Medical Student Teaching

Lecturer, Block 2:	Microcirculation, biophysics of circulation, control of blood pressure. 3 contact hours (2003), control of blood pressure (2004, 1 hour).

Problem Based Learning Instruction:

Tutor Block 1 (biochemistry)	72 contact hours (2001)
Tutor Block 2 (physiology)	72 contact hours (1997, 1998, 2000, 2003, 2006, 2009, 2010, 2012, 2015)
Tutor Block 3 (neuro)	72 contact hours (1995, 1997, 2000, 2003, 2005, 2012, 2015 mentored two 4th year medical students)
Tutor Block 4 (micro/immuno)	36 contact hours (1995 (half block), 1997 (half block))
Tutor Block 5 (genetics)	56 contact hours (1995)
Student Lab (cardiac infarct)	6 contact hours (1997, 1997 (Fall), 1998)
Lecturer, U. A. Guadalajara	Acid/base balance, endocrinology. 15 contact hours (1996)

Graduate Student Teaching:

Nutrition 8360	Nutritional Biochemistry of Carbohydrates, 3 lectures, Fall 2007.
Med Pharm Physiol 7310	Problem Based Learning Instructor, block 1 (8 weeks, 9 contact hours per week) (2005)
Med Pharm Physiol 411	Gastrointestinal physiology, metabolic endocrinology, 2 week interactive discussion lecture, block 6 hours per week (2004)
Med Pharm Physiol 310	Cell organelles, protein targeting, cell compartments, 6 contact hours (2003, 2004)
Physiol 440, MPP 431, 7431	Course Director, Control of Energy Metabolism, 45 contact hours, handled 12 lecture hours. Course is 3 credit hours (1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014).
Physiol 405	Endocrinology 5 contact hours (1996-2003)
Biochem 431 (Enzymology)	Cytoarchitecture and organized metabolism, 2 contact hours (1997, 1998, 1999, 2001, 2002, 2003, 2004)
Physiology 400 (Problems)	1995 (20 contact hours: organization of enzyme systems), 1996, 1997, 1998 (2 contact hours: muscle fatigue), 1999, 2000 (2 contact hours: hypoxic vasodilation), 1997 (15 contact hours: estrogen and vascular function), 1999, 2000 (15 contact hours: cell metabolism, toxicity)
Physiology 420 (membranes)	Energetic support of transporters (1994, 1996)

Undergraduate Teaching:

NS 3131 Mediterranean Diet	2012, 3 and 6 credit hours
NS3131 Food/Culture Japan	2016, 3 credit hours

Outreach Teaching:

Advanced Placement Institute	(PD APSC 690 through Truman State University)) Graduate level course (3 credit hours) to teach high school teachers, often from inner city and rural schools, how to teach Advanced Placement Biology. ~40-48 contact hours per course. (1999, 2000, 2001, 2002, 2003, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013). The Institute is College Board Endorsed.

Other AP Institutes	2 weeklong institutes, 1 for beginning AP Biology teachers, and 1 for experienced AP teachers, West Virginia (2007). The Institute is College Board Endorsed. Four Day Institute, Rochester, NY public schools, 2009. Four day Institute Asheville, NC 2010 and 2011, Four Day in Dublin, OH in 2011, Four Day in Los Angeles in 2012, Four Day in San Antonio in 2014, Henderson NV 2015, Tulsa OK 2015.
AP Biology Workshops	IUPU – Ft Wayne (2006), Univ. Minnesota (two, 2006), Triton College (two, 2007), Syracuse University (2007), AP Annual Conference , Las Vegas (2007), Cincinnati (2007), Cleveland (2008), Indianapolis (2010), Valleyview OH (2011), Kansas City, MO (2011), St. Louis, MO (2011), Bridgeville, PA (2011), Los Angeles, CA (2011) Madison, WI (two, 2011), Livonia, MI (two, 2011), Reno, NV (2012), Salt Lake City (2012), Fort Wayne, IN (2013), Butler Univ (2013), Univ. Wisconsin (2013), Los Angeles (2014)
AP Quantitative Skills	2016, Grayslake, IL.
Community Mentoring	2005-2007, West Boulevard Elementary School, Smithton Middle School: individual mentoring of a 5th - 7th grade student. 2007-2008, Big Brothers/Big Sisters of Central Missouri.

Curriculum Development:

2015/16-	Leader for the curriculum development for a new graduate certificate in Nutrition Communication (development in progress)
2014-	Development of a new undergraduate (BS) major in Human Physiology and Translational Sciences (development largely done, preparing campus proposal)
2007	Chair of the Medical Pharmacology and Physiology Ph.D. student curriculum task force
2005	Head of curriculum and facilities, MU grant proposal to HHMI for Undergraduate Biology Training (not awarded)
2005	Draft curriculum, head of curriculum development, MU proposal to HHMI/NIGMS for Graduate Student Interdisciplinary Biomedical Science (not awarded)

2002 Member of the four person team responsible for the formulation/design of the new graduate curriculum for the newly formed Department of Medical Pharmacology and Physiology.

Mentoring:

Dissertation/Thesis Committees:

Dissertation/Thesis Advisor

2011-2015 Ph.D. co-advisor for Monica Kearney, Department of Nutrition and Exercise Physiology, University of Missouri.

2007-2009 M.S. advisor for Katie Ward, Department of Medical Pharmacology and Physiology, University of Missouri. Currently in the MU/UMKC Pharm. D. program.

2005-2007 Ph.D. advisor for Mark Hernandez, Department of Medical Pharmacology and Physiology, University of Missouri. Currently teaching faculty at Ross University School of Medicine

2003-2006 Ph.D. advisor for Heather Mattern, Department of Medical Pharmacology and Physiology, University of Missouri. Currently an Assistant Professor, Augustana College, IL.

2000-2004 Ph.D. advisor for Johana Vallejo, Department of Physiology, University of Missouri. Currently an Associate Professor of Physiology, Midwestern University College of Osteopathic Medicine, Phoenix, AZ.

1997-2000 M.S. advisor for Tina Roberts, Department of Physiology, University of Missouri. Currently an Instructor, University of Missouri.

1996-2000 Ph.D. advisor for Tara Allen, Department of Physiology, University of Missouri. Currently an Associate Professor and Chair, William Jewel Univ.

1996-2000 Ph.D. advisor for Pamela Lloyd, Department of Physiology, University of Missouri. Currently associate professor and director of graduate studies, Oklahoma State University School of Veterinary Medicine

1994-1995 M.S. advisor for Valerie Gann, Dept. of Physiology, University of Missouri.

Graduate Student Committees, Member

- Monica Kearney, Department of Nutrition and Exercise Physiology, University of Missouri
- Leryn Boyle. Department of Nutrition and Exercise Physiology, University of Missouri
- Jacob Brown, Department of Biomedical Sciences, University of Missouri
- Rebecca Burkhalter, Department of Medical Pharmacology and Physiology, University of Missouri

- Matt Morris, Department of Nutrition and Exercise Physiology, University of Missouri
- Jasmine Nelson, Department of Medical Pharmacology and Physiology, University of Missouri (M.S. student)
- Mingzhai Sun, Department of Physics and Astronomy, University of Missouri
- Rie Sasaki, Department of Medical Pharmacology and Physiology, University of Missouri
- Ryan Jankord, Department of Biomedical Sciences, University of Missouri
- Gregg Rentfrow, Department of Animal Science, Univ. of Missouri.
- Jianjie Wang, Department of Physiology, University of Missouri.
- David Kump, Department of Physiology, University of Missouri.
- Kirk Abraham, Department of Physiology, University of Missouri.
- Carol Witczak, Department of Physiology, University of Missouri.
- Mohammad Aloosh, Department of Physiology, University of Missouri
- Mark Hernandez, Department of Physiology, University of Missouri
- Brian Wamhoff, Department of Physiology, University of Missouri
- Greg Simpson, Department of Biochemistry, University of Missouri
- Brent Hill, Department of Physiology, University of Missouri
- Brian Morin, Department of Physiology, Univ. of Missouri
- Paul Fell, Department Physiology, Univ. of Missouri. Transferred to M.S. track.

Post Doctoral Mentoring:

2003-04	Pamela Lloyd, postdoctoral fellow/Res Asst. Prof., University of Missouri

Other Mentoring (undergraduate students, others):

2009	Ashley Arrowood, undergraduate researcher and Nutrition and Exercise Physiology summer research intern, University of Missouri
2009	Phillip King, undergraduate researcher and Life Sciences Undergraduate Research Opportunity Program research intern, University of Missouri
2007	Caitlin Fischer, undergraduate researcher and Life Sciences Undergraduate Research Opportunity Program research intern, University of Missouri.
2003-2004	Leena Raikar, undergraduate researcher and Life Sciences Undergraduate Research Opportunity Program research intern, University of Missouri.
2003-2006	Catherine Stricklin, EXPRESS Program research intern and LSUROP intern. University of Missouri.
2002-2003	Abigail Peterson, Life Sciences Undergraduate Research Opportunity Program research intern. University of Missouri

2001-2003	Jonathan Hood, Life Sciences Undergraduate Research Opportunity Program research intern. University of Missouri.
2001-2002	Erin Johnson, EXPRESS Program research intern. University of Missouri.
2000-2001	Allison Hollenbeck, Life Sciences Undergraduate Research Opportunity Program research intern. University of Missouri
1999-2000	Tina Mirza, undergraduate researcher, University of Missouri.
1999	Lela Hall, Life Sciences Undergraduate Research Opportunity Program research intern. University of Missouri.
1998-99	Lela Hall, undergraduate "Capstone" research project student, University of Missouri.
1998-99	Brian Kleiber, Life Sciences Undergraduate Research Opportunity Program research intern. University of Missouri.
1998	Dorian Finder, American Heart Association Missouri Affiliate Summer Fellow, University of Missouri.
1997-98	Dorian Finder, Howard Hughes Institute summer and academic year research intern, University of Missouri.
1997-98	April Thompson, undergraduate research mentor, Fall and Winter Semester, University of Missouri.
1996	Dorian Finder, Conley Scholar, School of Medicine Summer Research Program, University of Missouri.
1994-95	Theresa McJunkin, Howard Hughes Institute academic year research intern, University of Missouri.
1994	Amy Ewen, Howard Hughes Institute summer research intern, University of Missouri.
1994	Erica Edwards, Minority High School Student Research Apprentice Program, University of Missouri.
1994	Timothy Juergens, Conley Scholar, School of Medicine Summer Research Program., University of Missouri.

Research Related Activities:

Research Interests:

- The regulation and organization of glycolysis
- Metabolomics
- Diabetes and smooth muscle metabolism
- Lipid metabolism and lipotoxicity - mitochondrial dysfunction in diabetes, atherosclerosis, and cell phenotype transformation
- Magnetic resonance measures of cellular metabolism
- Smooth muscle physiology/pathophysiology

- Localized metabolism-function coupling
- Cytoarchitecture (caveolae, cytoskeleton) and metabolic organization
- Macromolecular organization and protein-protein interactions
- Energetic support of cell signaling

Editorial Service:

Editorial Boards:

2005-2014 Member, Editorial Board, *American Journal of Physiology: Cell Physiology*

2008- Member, Editorial Board, *Cell Health and Cytoskeleton*.

2008- Member, Editorial Board, *International Journal of Physiology, Pathophysiology and Pharmacology*.

1997- Member, International Advisory Board, *Physiological Research*.

Guest Reviewer for 43 different journals: C*ardiovascular Research, American Journal of Physiology: Heart and Circ. Physiology*, *American Journal of Physiology: Cell Physiology, Journal of Molecular and Cellular Cardiology, Journal of Physiology (Lond.), Physiological Research, Molecular and Cellular Biochemistry, Journal of Vascular Research, Circulation Research, Applied and Environmental Microbiology*, *Journal of Neurochemistry, American Journal of Physiology: Endocrinology and Metabolism, Hypertension, American Journal of Physiology: Lung Cell. and Mol. Physiol., American Journal of Physiology: Gastrointestinal and Liver, Naunyn-Schmiedeberg's Archives of Pharmacology, Biochimica et Biophysica Acta., Comparative Biochemistry and Physiology, Life Sciences, In Vitro Cellular & Developmental Biology – Animal, Yonsei Medical Journal, Journal of Applied Physiology, Biomedical Signal Processing and Control***,*** *General Pharmacology, Neurourology and Urodynamics, Analytical Biochemistry, Canadian Journal of Pharmacology and Physiology, FEBS, FEBS Letters, International Journal of Biochemistry and Cell Biology, Cellular and Molecular Biology Letters, Arteriosclerosis, Thrombosis and Vascular Biology, IUBMB Life, Physiological Genomics, Biochemistry, Biophysical Journal; Nature: Cell Biology, FASEB J., Obesity.; Nutrition Research, Annals of Medicine, J. Cardiovascular Pharmacology,*

Grant Review Service:

2016 Chair, NIDDK P30 Diabetes Research Centers, Bethesda, MD, 20 October.

Reviewer, NIDDK P20 Developmental Centers for Interdisciplinary Research in Benign Urology, Bethesda, MD. 27 June.

Reviewer, NIH Special Emphasis Panel on R21s for Accelerating Translation of Glycoscience: Integration and Accessibility, Washington DC, 30-31 March.

Reviewer, K01 RFAs to promote Faculty and Trainee Diversity, Washington DC, 3 March.

2015 Reviewer, K01 RFAs to promote Faculty and Trainee Diversity, Washington DC, 8 June.

2014 Reviewer, P awards for Diabetes Centers, Bethesda, MD, 20 Oct.

2013 Reviewer, K01 RFAs to promote Faculty and Trainee Diversity, Washington DC, 14 June.

2012 Reviewer, K01 and R25 RFAs to promote Faculty and Trainee Diversity, Bethesda, MD, 11 Oct.

2012 Spring AHA Cell Function and Metabolism Study Section, 30 March.

2012 Reviewer, K01 and R25 RFAs to promote Faculty and Trainee Diversity, Hyatt Hotel, Dulles, VA 28-29 Feb.

2011 Fall AHA Cell Function and Metabolism Study Section, 05 October.

2011 Reviewer "*Identification of Biomarkers for Early Detection of Environmentally-Induced Mitochondrial Dysfunction (R01*)" Research Triangle Park, NC June 1-3. NIH/NIEHS

2011 Lead Reviewer/application chair, reviewer NIH Mouse Metabolic Phenotyping Center Consortium review panel. 28 Feb- 1 March, Bethesda, MD

2011 Reviewer for SEP on Mentored Career Development Award to Promote Faculty Diversity/Re-Entry in Biomedical Research K01. 4 March, Washington, DC.

2011 Spring AHA Cell Function and Metabolism Study Section, 20 April.

2010 NIH HL K01 Review Committee 29 January, Bethesda

2010 Ad Hoc Reviewer, NIH Study Section on Cellular Aspects of Diabetes and Obesity, 8-9 February, Washington, DC

2010 Spring AHA Cell Function & Metabolism Study Section, 12 April

2010 Fall AHA Cell Function & Metabolism Study Section 30 Sept.

2010 Basic and Translational Oncology P01 Review Panel, NCI, North Bethesda, 30 Sept-1 October.

2010 Grant reviews, Spring and Fall, Pennsylvania Department of Health/Oak Ridge Associated Universities.

2010 Grant review, Theoretical Biology, National Science Foundation, May 2010

2009 Mail Reviewer for RC grants (ARRA)

2009 NHLBI GOTRIP (translational research) review panel 22-23 July, Bethesda

2008 Fall AHA Cell Function and Metabolism Study Section, 22 October, Dallas, TX

2008 Reviewer for Urology SEP, NIH, 17 July 2008.

2008 Reviewer for Urology SEP, NIH, 2 April 2008.

2007	Reviewer for Urology SEP, NIH, 4 April, 2007.
2007	Ad Hoc Reviewer, NIH Study Section on Cellular Aspects of Diabetes and Obesity, June 12.
2007	Fall AHA Cell Function and Metabolism Study Section, 18 October, Dallas TX.
2007	Reviewer for Urology SEP, NIH, 12 December 2007
2006	Ad Hoc Reviewer, NIH Study Section on Cellular Aspects of Diabetes and Obesity, October 19-20, 2006, Bethesda, MD.
2005	Ad Hoc Reviewer, NIH Study Section on Cellular Aspects of Diabetes and Obesity, October 20-21, 2005, Bethesda, MD.
2005	Fall AHA Cell Function & Metabolism Study Section, 11 October
2005	Spring AHA Cell Function & Metabolism Study Section, 18 April, Dallas, TX
2005	NIH Study Section for RFA RFA-ES-04-008: Metabolomics: Application to Environmental Health Research. Research Triangle Park, North Carolina, March 3, 2005
2005	Florida State University Cornerstone Program Enhancement Grant Reviewer.
2004	Ad Hoc Reviewer, NIH Study Section on Cellular Aspects of Diabetes and Obesity, 21-22 October, 2004, Bethesda, MD.
2004	NIH Study Section for RFA on "Metabolomics Technology Development", ZRG1 EMNR J 50, Bethesda, MD, June 9-11, 2004
2003	NIH Institutional Training Grant Study Section, Rockville, MD, 21-23 September, 2003.
2003	NIH Study Section for RFA-DK-03-010 "Basic Research in Interstitial Cystitis". 9-10 July, Chevy Chase, MD.
2002, 04	Conference Proposal Reviewer, Gordon Research Conferences.
2002	NIH Study Section for RFA NHLBI RFA HL-02-016, "Pathophysiologic Mechanisms of Obesity-Associated Cardiovascular Disease." 28-29 October, Chevy Chase, MD.
2002	Ad Hoc Reviewer, Veteran's Administration Merit Review.
2001	Member, NIH Urology Special Emphasis Panel, Bethesda, MD 8-9 November.
2001	Grant review, Canada Foundation for Innovation.
2001	Member, NIH Urology Special Emphasis Panel, Bethesda, MD 5-6 March.
2001	Site Visit Team, NIH NCRR, Dallas TX 25-27 March.
1999	NIH Study Section for RFA on "Approaches to Basic Bladder Biology – Painful Bladder Syndrome", Baltimore, MD, 24-25 June 1999.

1998- 2005	Grant review, NSF Integrative Animal Biology Program (1998, 2000, 2005)
1996-	Grant Review for the University of Missouri Research Board (1996, 98-00, 02, 03, 08)
1997	Member Ad Hoc NIH Study Section on Shared Instrumentation, Arlington, VA, 14 August.
1997	Member, Peer Review Committee, American Heart Association - Missouri Affiliate, St. Louis, MO, 7 March.
1995	Ad Hoc Reviewer, Veteran's Administration Merit Review.
1993	Ad Hoc Study Section Reviewer, NIH Research Training Review Committee, NHLBI, 3-5 October. Bethesda, MD.

Professional Consulting Activities:

2002-2003	Expert scientific consultant on mitochondrial myopathy and rhabdomyolysis. Barrios, Kingsdorf & Casteix, New Orleans, LA.

Research Grants:

Principal Investigator:

2009-2010	J.R. Albert Foundation "University of Missouri (MU) Metabolic Kitchen"
2008-2011	American Heart Association Midwest Affiliate "Metabolic organization by caveolae: energetics of force sensitivity and calcium handling" Grant-In-Aid.
2002-2013	MU PREP Scholars Program (R25 GM 064120-01; minority postbac training grant). Role: Co-PI (co-PI with John David)
2007-2009	University of Missouri Research Board Grant "Metabolomic Development of a Biomarker for Statin-Associated. Myopthy"
2003-2009	NIH DK-60668: "Metabolic Organization by the Caveolae and Cytoskeleton".
2007-2008	Research Council Grant for a collaborative visit to Imperial College London to utilize the COMET2 metabonomics/systems biology platform for a project on metabonomics of statin-associated myopathy
2004-2005	NIH R13-GM072436: "Gordon Conf. Macromolecular Organization & Cell Function"
2003	Faculty Development Grant to attend a two week intensive molecular biology workshop.
2000-2003	American Heart Association, Heartland Affiliate "The Caveolae and Cytoskeleton in the Organization of Vascular Metabolism".

2001	Children's Miracle Network "Vascular Mitochondrial Dysfunction in Diabetes".
2000	University of Missouri Research Board "Caveolae and the Organization of Metabolism".
1999-2001	American Heart Association – Heartland Affiliate, Sponsor for a Pre-doctoral Fellowship for Pamela Lloyd.
1998-2003	NIH DK-55039 "Diabetes & Bladder Smooth Muscle Metabolic Dysfunction".
1997-2000	Established Investigator Grant "Vascular Substrate Utilization and Compartmentation", American Heart Association.
1998	Small Research Council Grant "Mechanisms of FBP Transport/Metabolism: A Collaboration", University of Missouri Research Council.
1998	American Heart Association Missouri Affiliate Summer Student Fellowship for Dorian Finder.
1997-1998	NIH RR 011962 Instrumentation Grant, "Upgrade of a wide-bore 300 MHz NMR Spectrometer".
1997	Alumni Association Faculty Incentive Grant.
1996-1998	NATO Collaborative Research Grant "Novel Medicinal Uses of Fructose 1,6-Bisphosphate During Ischemia".
1996-1997	University of Missouri Research Board Grant "Integrated Vascular Metabolism Studied by ^{13}C and ^{1}H NMR".
1996, 2004	Faculty International Travel Award.
1995-1998	Grant-In-Aid, American Heart Association National Center "Probing the Structural Basis of Glycolytic Organization". (terminated 12/31/96 to accept EI grant).
1992-1996	NIH HL48783: "Integrated Vascular Smooth Muscle Metabolism".
1994	Faculty Development Award, University of Missouri "Learning Applications of Fluorescence Recovery After Photobleaching (FRAP) and Other Fluorescent Techniques".
1994	University of Missouri, Research Council Award "Probing the Structural Basis of Glycolytic Organization".
1991-92	Grant-In-Aid, American Heart Association of WA (91-WA-528) "Integrated Vascular Smooth Muscle Metabolism Studied by ^{13}C-NMR".

Invited Symposium Talks

2013	Speaker in a Symposium honoring Richard Paul and Bob Banks, University of Cincinnati College of Medicine, 13 May 2013.

2007 Speaker "Metabolomic Approaches to Study Cardiovascular Disease Mechanisms and Diagnosis", Experimental Biology, 28 April – 2 May, Washington, DC.

2006 Invited Speaker, session on Enzyme Localization in the Control of Metabolism, Gordon Research Conference on Macromolecular Organization and Cell Function: Cellular Systems Biology, Mt Holyoke, MA, Aug 6-11.

2005 Invited speaker, session on Protein-Protein Recognition, 30th FEBS Congress, 9th IUBMB Conference, Budapest, Hungary, 2-7 July.

2004 Invited Speaker for the Annual Ryan Fellows Meeting, Dartmouth Minary Center, Holderness, NH, 13-15 May.

2002 International Symposium on Medicinal Uses of FDP, Huajin Pharmaceuticals, Beijing, China, 23-25 April.

2001 Invited Speaker, Fifth International Conference on Muscle Energetics, Burlington, VT 14-17 July.

2001 Invited Speaker, session co-chair, Regulation of Energy Metabolism in the Heart and Vasculature, Banff, Canada, 2-5 July.

2000 Invited Speaker, Albert J. Ryan Fellowship Foundation 25th Anniversary Symposium, Cincinnati, OH 27 May.

1998 Invited Speaker, workshop on "NMR of Muscle: *In Vivo* Assessment of ATP Synthesis". Biophysical Society Meeting, Kansas City, MO, February 25.

1996 Invited Speaker and Discussion Leader, Gordon Research Conference on Macromolecular Organization and Cell Function, session entitled "Minimally Invasive Studies", Oxford, U.K., September 1-6.

1996 Invited Speaker, 2nd Conference on Molecular Recognition, session entitled "Molecular Recognition in Multienzyme Systems", Pecs, Hungary, Aug. 18-21.

1994 Invited speaker in "Noninvasive Bioanalysis with NMR Spectroscopy", talk entitled: "^{13}C-NMR Analysis of Organized Glycolytic Metabolism in Vascular Smooth Muscle", Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies, St. Louis, MO, Oct. 2-6.

1992 Invited speaker in "Cellular and Molecular Mechanisms of Vascular Responses to Metabolic Stress", talk entitled: "Vascular Responses to Alterations in the Levels of Phosphorous Metabolites", Annual Meeting of the International Society for Heart Research, Burlington, VT, June 17-20.

Other Activities:

2007 Co-Chair and Organizer, "Metabolomic Approaches to Study Cardiovascular Disease Mechanisms and Diagnosis", Cardiovascular

	Section sponsored symposium, Experimental Biology, 28 April – 2 May, Washington, DC.
2004	Co-Chair, Gordon Research Conference on "Macromolecular Organization and Cell Function", August 15-20 2004 in Oxford, UK.
2002	Vice Chair, Gordon Research Conference on "Macromolecular Organization and Cell Function", 4-9 August, 2002, Oxford, UK; chair, session on "Imaging of Intracellular Processes".
1999-2001	Scientific Advisory Committee for "Regulation of Energy Metabolism in the Heart and Vasculature", 2-5 June, 2001, Banff, Canada, a satellite meeting of the World Congress of the International Society for Heart Research, Winnipeg.
1997	Poster Moderator, Section on "Oxidative metabolism in the cardiovascular system", World Congress of the International Society for Heart Research, Rhodes, Greece, 31 May.

Publications:

Peer Reviewed Publications

Morris EM**,** Meers GM**,** Booth FW**,** Fritsche KL**, Hardin CD**, Thyfault JP**,** Ibdah JA**.** (2012) PGC-1α overexpression results in increased hepatic fatty acid oxidation with reduced triacylglycerol accumulation and secretion. *Am J Physiol Gastrointest Liver Physiol*. 2012. Aug 16.

Lloyd P.G. and **Hardin C.D**. (2011) Caveolae and Cancer: Two Sides of the Same Coin? Am. J. Physiol. Cell Physiol. 300(2): C232-4.

Hardin, C.D. and Vallejo J. (2009) Dissecting the functions of protein-protein interactions: caveolin as a promiscuous partner. Am. J. Physiol. Cell Physiol. 296(3): C387-C389

Mattern H.M. and **Hardin C.D**. (2008) The effect of Cav-1 on fatty acid uptake and CD36 localization and lipotoxicity in VSM cells. Int J. Physiol Pathophysiol. Pharmacol. 1:1-14.

Mattern, H.M., Lloyd, P.G., Sturek, M, and **Hardin C.D.** (2007). Gender and genetic differences in bladder smooth muscle PPAR mRNA in a porcine model of the metabolic syndrome. *Mol. Cell Biochem.* 302: 42-49.

Mattern, H.M., and **Hardin, C.D.** (2007) Vascular metabolic dysfunction and lipotoxicity. *Physiological Research* 56: 149-158.

Raikar, L.S., Vallejo, J., Lloyd. P.G. and **Hardin, C.D.** (2006). Overexpression of Caveolin-1 Results in Increased Plasma Membrane Targeting of Glycolytic Enzymes: The Structural Basis for a Membrane Associated Metabolic Compartment. *Journal of Cellular Biochemistry* 98: 861-871.

Hardin, C.D. and Vallejo J. (2006). Caveolins in Vascular Smooth Muscle: Form Organizing Function. *Cardiovascular Research* 69(4): 808–815.

Vallejo, J. and **Hardin, C.D.** (2005) Expression of caveolin-1 in lymphocytes induces caveolae formation and recruitment of phosphofructokinase to the plasma membrane *FASEB J.* Apr;19(6):586-7. **http://www.fasebj.org/cgi/doi/10.1096/fj.04-2380fje;**

Vallejo, J. and **Hardin, C.D.** (2004) Caveolin-1 Functions as a Scaffolding Protein for Phosphofructokinase in the Metabolic Organization of Vascular Smooth Muscle *Biochemistry* 43(51):16224-32.

Vallejo, J, and **Hardin C.D**. (2004). Metabolic organization in vascular smooth muscle: distribution and localization of caveolin-1 and phosphofructokinase. *American Journal of Physiology: Cell Physiology 286: C43-C54*.

Hardin, C.D., Kleiber, B.D., and Roberts, T.M. (2003). Mitochondrial oxidative substrate selection in porcine bladder smooth muscle. *Journal of Urology* 170: 2063-2066.

Greenwalt, T.J., Gormas, J.F., Rugg, N., Rios, J., Goldsmith, J.C., Prokopczuk, E., **Hardin, C.D**., and Roberts, T.M. (2002) Evaluation of fructose diphosphate in RBC preservation. *Transfusion* 42: 384-385.

Hardin, C.D., Lazzarino, G., Tavazzi, B, DiPierro, D, Roberts, T, Giardina, B, and Rovetto, M.J. (2001). Myocardial metabolism of exogenous FDP is consistent with transport by a dicarboxylate transporter. *American Journal of Physiology*. 281: H2654-2660.

Allen, T.J. and **Hardin, C.D.** (2001). Oleate oxidation and mitochondrial substrate selection in vascular smooth muscle. *Journal of Vascular Research* 38(3): 276-287.

Lloyd, P.G., and **Hardin, C.D.** (2001). Caveolae and carbohydrate metabolism in vascular smooth muscle. *J. Cell Biochem* 82: 399-408.

Roberts, T.M., Sturek, M., Dixon, J., and **Hardin, C.D**. (2001). Alterations in the oxidative metabolic profile in vascular smooth muscle from atherogenic swine. *Molecular and Cellular Biochemistry* 217: 99-106.

Hardin C.D. (2001). Making sense of oxygen sensing. *Journal of Physiology* 536: 1.

Lloyd, P.G., and **Hardin, C.D.** (2000). Sorting of metabolic pathway flux by the plasma membrane in cerebrovascular smooth muscle cells. *American Journal of Physiology: Cell Physiology.* 47: C803-811.

Allen, T.J. and **Hardin, C.D.** (2000). The influence of glycogen storage on vascular smooth muscle metabolism. *American Journal of Physiology: Heart and Circulatory Physiology.* 278: H1993-2002.

Lloyd, P.G., and **Hardin, C.D.** (1999). The role of microtubules in the regulation of metabolism in isolated cerebral microvessels. *American Journal of Physiology: Cell Physiology* 277: C1250-1262.

Lloyd, P.G., **Hardin, C.D.,** and Sturek, M. (1999). Examining glucose transport in single vascular smooth muscle cells with a fluorescent glucose analog. *Physiological Research* 48: 401-410.

Finder, D.R. and **Hardin, C.D.** (1999). Transport and metabolism of exogenous fumarate and 3-phosphoglycerate in vascular smooth muscle. *Molecular and Cellular Biochemistry* 195:113-121.

Allen, T.M. and **Hardin, C.D.** (1998). The pattern of substrate utilization in vascular smooth muscle using ^{13}C-isotopomer analysis of glutamate. *American Journal of Physiology:* 275(44): H2227-H2235.

Hardin, C.D. and Finder, D.R. (1998). Glycolytic flux in permeabilized freshly isolated vascular smooth muscle cells. *American Journal of Physiology:* 274(43): C88-C96.

Hardin, C.D. and Roberts, T.M. (1997). Regulation of glycogen utilization, but not glucose utilization, by pre-contraction glycogen levels in vascular smooth muscle. *Biochemistry* 36(23): 6954-6959.

Gann V.K. and **Hardin, C.D.** (1997). Administration of either octanoate or acetate increases glycogenolysis in vascular smooth muscle with high glycogen levels. *Physiological Chemistry and Physics and Medical NMR* 29: 23-32.

Hardin, C.D. and Roberts, T.M. (1997). Differential regulation of glucose and glycogen metabolism in vascular smooth muscle by exogenous substrates. *Journal of Molecular and Cellular Cardiology* 29: 1207-1216.

Dykens, J.A., Wiseman, R.W., and **Hardin, C.D**. (1996). Preservation of phosphagen kinase function during transient hypoxia via enzyme abundance or resistance to oxidative inactivation. *Journal of Comparative Physiology* 166:359-368.

Juergens, T.M. and **Hardin, C.D**. (1996). Fructose-1,6-bisphosphate as a metabolic substrate in hog ileum smooth muscle during hypoxia. *Molecular and Cellular Biochemistry* 154:83-93.

Hardin, C.D. and Roberts, T.M. (1995). Compartmentation of glucose and fructose-1,6-bisphosphate metabolism in vascular smooth muscle. *Biochemistry* 34(4): 1323 1331.

Hardin, C.D. and Roberts, T.M. (1995). Gluconeogenesis During Hypoxia in Vascular Smooth Muscle Studied by ^{13}C-NMR. *Physiological Research* 44:257-260.

Hardin C.D., Kushmerick, M.J., and Roberts, T.M. (1995). Vascular smooth muscle glycogen metabolism studied by ^{13}C-NMR. *Journal of Vascular Research* 32:293-300.

Hardin, C.D. and Roberts, T.M. (1994). The metabolism of exogenously applied fructose-1,6-bisphosphate in hypoxic vascular smooth muscle. *American Journal of Physiology* 267(36): H2325-2332.

Hardin, C.D., and Kushmerick, M.J. (1994). Simultaneous and separable flux of pathways for glucose and glycogen utilization studied by ^{13}C-NMR. *Journal of Molecular and Cellular Cardiology* 26: 1197-1210.

Hardin C.D., Paul, R.J., Raeymaekers, L., Steenart N.A.E., and Kranias, E.G. (1993). Regulation of glycolytically fueled Ca^{2+}-uptake in smooth muscle plasmalemmal vesicles by phosphorylation. *American Journal of Physiology.* 263(34): H1326-H1333.

Hardin, C.D., Wiseman, R.W., and Kushmerick, M.J. (1992). Vascular oxidative metabolism under different metabolic conditions. *Biochimica et Biophysica Acta* 1133: 133-141.

Skubatch, H., **Hardin, C.D.,** Wiseman, R.W., Meeuse, B.J.D., and Kushmerick, M.J. (1992). The energetic state of the thermogenic appendix of the voodoo lily inflorescence: A ^{31}P NMR study. *Biochimica et Biophysica Acta* 1100: 98-103.

Hardin, C.D., Raeymaekers, F., and Paul, R.J. (1992). Comparison of endogenous and exogenous sources of ATP in supporting Ca^{2+}-uptake in isolated smooth muscle plasma membrane vesicles (PMV). *Journal of General Physiology.* 99: 21-40.

Hardin, C.D., Wiseman, R.W., and Kushmerick, M.J. (1992). Tension responses of sheep aorta to simultaneous decreases in phosphocreatine, inorganic phosphate, and ATP. *Journal of Physiology* (Lond.) 458: 139-150.

Hardin, C.D., and Paul, R.J. (1992). Localization of two glycolytic enzymes in guinea pig *taenia coli. Biochimica et Biophysica Acta* 1134: 256-259.

Paul, R.J., **Hardin, C.D.,** Raeymaekers, L., Wuytack, F., and Casteels, R. (1989). An endogenous glycolytic cascade can preferentially support Ca^{2+}-uptake in smooth muscle plasma membrane vesicles. *FASEB Journal* 3: 2299-2301.

Under review:

Hernandez, M.J., Raikar, L.S., Roberts, T.M., and **Hardin, C.D.** Localization of multiple glycolytic enzymes to the plasma membrane can occur by a caveolin-1 mediated mechanism. Under review

Hernandez, M.J., Roberts, T.M., and **Hardin, C.D**. Localization of multiple glycolytic enzymes with caveolin-1 in astrocytes, a possible organizational role: modulation by ammonia. Under review.

Invited Papers/Book Chapters:

Hardin, C.D., Allen, T.J., and Paul, R.J. (2001). Metabolism and energetics of vascular smooth muscle. In: Physiology and Pathophysiology of the Heart., 4th Edition, N. Sperelakis (ed)., Kluwer Academic Publishers, Norwell, MA. pp 571-595.

Hardin, C.D. and Paul, R.J. (1995). Metabolism and energetics of vascular smooth muscle. In: Physiology and Pathophysiology of the Heart., 3rd Edition, N. Sperelakis (ed)., Kluwer Academic Publishers, Norwell, MA. pp 1069-1086.

Paul, R.J., **Hardin, C.D.,** Campbell, J., and Raeymaekers, L. (1989). Compartmentation of Metabolism and Function in Smooth Muscle, in Muscle Energetics (Paul, Elzinga, and Yamada, eds.), pp. 381-390, Alan R. Liss, New York.

Published Abstracts:

Ward, K.R., Roberts, T.M., Hardin, C.D.(2009) Decreased metabolic flexibility in vascular smooth muscle (VSM): does PDK-3 determine pyruvate dehydrogenase (PDH) complex flux? *J. Mol. Cell. Cardiol.*46(5) S14.

Fischer, C.N. and **Hardin, C.D.** (2008) Glycolytic enzyme interactions with the caveolin scaffolding domain (CSD) in a lymphocyte model. FASEB J. 22: 1180.3

Hernandez, M.J. and **Hardin, C.D.** (2008) Mutation of the Caveolin-Scaffolding Domain Reduces Phosphofructokinase Localization to the Plasma Membrane in Vascular Smooth Muscle. FASEB J. 22: 965.1

Klaahsen, D.L., Zhang, H., Park, Y., Lee, S., **Hardin, C**., and Zhang, C. (2008) Extra virgin olive oil and vascular health. FASEB J. 22:lb63.

Hernandez, M.J., and **Hardin, C.D.** (2007) Caveolin-1 and the organization of glycolysis in astrocytes: Modulation by Ammonia. FASEB J. 21:748.9

Hernandez, M.J., and **Hardin, C.D.** (2007) The Association of Caveolin-1 with the Organization of Glycolysis in the Photoreceptors and Müller Glial Cells of the Pig Retina. FASEB J. 21:748.10

Raikar, L.S. and **Hardin, C.D.** (2006) Heterogeneity of glycolytic enzyme localization in freshly isolated vascular smooth muscle cells (VSMC). FASEB J. 20: LB20

Mattern, H.M., Raikar, L.S., and **Hardin, C.D.** (2006) The effect of caveolin-1 (CAV-1) on fatty acid uptake and CD36 localization in vascular smooth muscle (VSM) cells FASEB J. 20 (4): A1293

Stricklin, C.I., Raikar, L.S., Roberts, T.M. and **Hardin, C.D.** (2006) Enzyme localization does not affect global glycolytic rate in resting smooth muscle cells. FASEB J 20: LB10.

Hernandez, M., Raikar, L.S., Roberts, T.M, and **Hardin, C.D**. (2006) Localization of glycolysis to the plasma membrane can occur by a caveolin-1 mediated mechanism. Biophys. J.

Hardin, C.D. (2005) Structural basis of glycolytic compartmentation: a cytoarchitect's guide to metabolism. FEBS Journal 272: 398.

Hardin, C.D., Raikar, L.S., Lloyd, P.G., and Roberts, T.M. (2005) Overexpression of caveolin-1 results in increased plasma membrane targeting of phosphofructokinase (PFK): The structural basis for a membrane associated metabolic compartment. FASEB J. 19(4): A273.

Vallejo, J., Roberts, T.M., and **Hardin, C.D**. (2005) New caveolin-1 expression in lymphocytes functions as a scaffold for glycolysis by recruitment of phosphofructokinase to the plasma membrane. FASEB J. 19(4): A663.

Hardin, C.D., Lloyd, P.G., Mattern, H.M., Stricklin, C., Sturek, M., and Roberts, T.M. (2005) Smooth muscle caveolin-1 mRNA levels are reduced in a genetic model of the metabolic syndrome and modulated by high fat diets. FASEB J. 19(4): A195.

Roberts, T.M. and **Hardin, C.D**. (2005) Metabolic fuel switching is limited in vascular smooth muscle (VSM): a role for PDK3? FASEB J. 19(4): A632.

Mattern, H.M., Lloyd, P.G., Sturek, M., and **Hardin, C.D.** (2005) Gender and genetic differences in bladder smooth muscle PPAR mRNA in a porcine model of the metabolic syndrome. FASEB J 19(4): A260.

Mattern, H.M., Allen, T.J., Roberts, T.M., and **Hardin, C.D.** (2005) Lipotoxicity in vascular smooth muscle (VSM). FASEB J. 19(4): A699.

Hardin, C.D., Petersen, A., Sturek, M. and Roberts, T.M. (2005) Bladder smooth muscle from diabetic/dyslipidemic swine exhibit altered phenotype and metabolic dysfunction: pathogenesis of lipotoxicity in smooth muscle. FASEB J. 19(4): A124.

Vallejo, J. and **Hardin, C.D.** (2004). Caveolin-1 (CAV-1) functions as a scaffolding protein for phosphofructokinase (PFK) in the metabolic organization of vascular smooth muscle (VSM) *Late breaking abstract to EB 2004*

Vallejo, J. and **Hardin, C.D.** (2003). Smooth muscle metabolic organization: a role for caveolar domains of the plasma membrane. *FASEB J. 17 (4): A48*

Peterson, A., Roberts, T.M., Sturek, M., Dixon, J.L., and **Hardin, C.D.** (2003). Bladder smooth muscle phenotype alterations in diabetic/dyslipidemic swine: a role for lipotoxicity? *FASEB J. 17(4) A454.*

Hood, J., Roberts, T.M., Rovetto, M.J., and **Hardin, C.D.** (2003). Preferential oxidation of exogenous fructose bisphosphate: novel channeling to the mitochondria? *Late breaking abstract to EB 2003.*

Vallejo, J. and **Hardin, C.D.** (2002). Metabolic Organization in Vascular Smooth Muscle (VSM): Distribution and Localization of Caveolin-1 (CAV-1) and Phosphofructokinase (PFK). *FASEB J. 16(4):A97*.

Hardin C.D. (2001). Redox and metabolism in the vascular wall: an overview. *J. Mol. Cell. Cardiol.* 33(6) A157.

Vallejo, J. and **Hardin, C.D.** (2001). Localization of caveolin-1 and phosphofructokinase and metabolic organization in vascular smooth muscle. *J. Mol. Cell. Cardiol.* 33(6) A125.

Hollenbeck, A.C., Roberts, T.M., and **Hardin C.D.** (2001). Type II diabetes-induced alterations in mitochondrial substrate utilization may be due to effects of palmitate. *J. Mol. Cell. Cardiol.* 33(6) A48.

Allen, T.J. and **Hardin, C.D.** (2001). Oxidation and storage of long-chain lipid (oleate) in vascular smooth muscle. *J. Mol. Cell. Cardiol.* 33(6) A161.

Lloyd, P.G. and **Hardin, C.D.** (2000). Caveolae and metabolic organization. *FASEB J.* 14(4): A149.

Allen, T.J. and **Hardin, C.D.** (2000). The influence of glycogen storage on vascular smooth muscle metabolism. *FASEB J.* 14(4): A149.

Roberts, T.M., Kleiber, B.D., and **Hardin, C.D.** (1999). ^{13}C-Isotopomer analysis of substrate utilization in porcine bladder. *FASEB J.* 13(5):A902.

Lloyd, P.G. and **Hardin, C.D.** (1999). Channeling and organization of glycolysis and gluconeogenesis in permeabilized pig cerebral microvessels (PPCMV). *FASEB J.* 13(5):A33.

Lloyd, P.G. and **Hardin, C.D.** (1999). The role of microtubules in the regulation of glycolysis in freshly isolated pig cerebral microvessels (PCMV). *Biophys. J.* 76(1): A42.

Hardin, C.D., Giardina, B., Tavazzi, B., DiPierro, D., Lazzarino, G., Galvano, M., and Rovetto, M.J. (1998). Transport mechanism of fructose 1,6-bisphosphate in isolated rat hearts. *J. Mol. Cell. Cardiol.* 30: A62.

Roberts, T.M., Sturek, M., Dixon, J., Weisman, G.A., and **Hardin, C.D.** (1998). Substrate utilization in carotid arteries from normal, diabetic/hyperlipidemic, and hyperlipidemic pigs. *J. Mol. Cell. Cardiol.* 30: A109.

Lloyd, P.G., A.D. Thompson, and **Hardin, C.D.** (1998). Examining the structural basis of compartmented glycolysis in pig cerebral microvessels. *J. Mol. Cell. Cardiol.* 30: A122.

Lloyd, P.G., **Hardin**, **C.D.**, and M. Sturek. (1998). Use of a small fluorescent glucose analog as an indicator of glucose transport in pig vascular smooth muscle cells. *J. Mol. Cell. Cardiol.* 30: A63.

Finder, D.R. and **Hardin, C.D.** (1998). Glyconeogenesis from proglycogen in vascular smooth muscle (VSM). *J. Mol. Cell. Cardiol.* 30: A123.

Jeffrey, T.M., and **Hardin, C.D.** (1998). The pattern of substrate utilization in vascular smooth muscle using ^{13}C-isotopomer analysis of glutamate. *J. Mol. Cell. Cardiol.* 30: A160.

Finder, D.R. and **Hardin, C.D.** (1998). Transport of exogenous fumarate and 3-phosphoglycerate (3-PG) by a dicarboxylate transporter. *J. Mol. Cell. Cardiol.* 30: A123.

Hardin, C.D., Roberts, T.M., Finder, D.R., Lloyd, P.G., and Jeffrey T.M. (1998). Organization and integration of metabolism in vascular smooth muscle (VSM) assessed by ^{13}C-NMR. *Biophys. J.* 74(2): A224.

Finder, D.R. and **Hardin, C.D.** (1997). Exogenous ^{13}C-fumarate metabolism in hypoxic vascular smooth muscle (VSM). *J. Mol. Cell. Cardiol.* 29(6): A191.

Finder, D.R. and **Hardin, C.D.** (1997). Glycolytic flux in permeabilized freshly isolated hog carotid vascular smooth muscle cells. *J. Mol. Cell. Cardiol.* 29(6): A190.

Hardin, C.D. and Roberts, T.M. (1997). Influence of glycogen levels on glycogen and glucose utilization in contracting vascular smooth muscle. *J. Mol. Cell. Cardiol.* 29(6): A191.

Hardin, C.D. and Roberts, T.M. (1996). Modulation of glucose and glycogen metabolism in vascular smooth muscle (VSM) by alternate exogenous substrates studied by ^{13}C-NMR. *FASEB J*. 10(3): A725.

Hardin, C.D. and Roberts, T.M. (1995). Compartmentation of glycolysis and gluconeogenesis in vascular smooth muscle. *FASEB J*. 9(3): A315.

Juergens, T.M. and **Hardin, C.D.** (1995). The protective role and metabolism of fructose-1,6-bisphosphate in hog ileum smooth muscle during hypoxia. *FASEB J*. 9(3):A422.

McJunkin, T.L., Ewen, A.J., Roberts, T.M., and **Hardin, C.D.** (1995). ^{13}C-NMR studies of glycolytic metabolism in freshly isolated vascular smooth muscle cell suspensions. *FASEB J*. 9(3):A608.

Gann, V., Roberts, T.M., Edwards, E., and **Hardin, C.D.** (1995). Effects of short-chain fatty acid utilization on glucose and glycogen utilization in hog carotid artery studied by ^{13}C-NMR. *FASEB J*. 9(3):A608.

Hardin, C.D., and Roberts, T.M. (1994). Fructose 1,6-bisphosphate (FDP) is metabolized by hypoxic vascular smooth muscle, as determined by ^{13}C-NMR, but does not improve maintenance of isometric force. *FASEB J.* 8(4): A556.

Hardin, C.D., and Kushmerick, M.J. (1992). ^{13}C-NMR Assessment of the dynamics and order of vascular glycogen synthesis and mobilization. *J. Mol. Cell. Cardiol.* 24:S25.

Wiseman, R.W., **Hardin, C.D.,** and Dykens, J.A. (1992). Dynamics of PCr recovery following hypoxia in smooth muscle. *J. Mol. Cell. Cardiol.* 24:S25.

Hardin, C.D., and Kushmerick, M.J. (1992). Simultaneous and separable flux of pathways for glucose and glycogen utilization in vascular smooth muscle studied by ^{13}CNMR. *J. Mol. Cell. Cardiol.* 24:S25.

Hardin, C.D., Wiseman, R.W., and Kushmerick, M.J. (1992). Tension responses of sheep aorta to simultaneous decreases in Pi, PCr, and ATP. *J. Mol. Cell. Cardiol.* 24:S24.

Hardin, C.D., Wiseman, R.W., and Kushmerick, M.J. (1992). The role of phosphorous metabolites in alterations of vascular tone. Society of Magnetic Resonance in Medicine XIth Annual Meeting, Berlin, Germany.

Hardin, C.D., Wiseman, R.W., and Kushmerick, M.J. (1991). Multiple controls of vascular oxidative metabolism. Society of Magnetic Resonance in Medicine Xth Annual Meeting. San Francisco, California.

Hardin, C.D., and Kushmerick, M.J. (1991). Glucose metabolism and glycogen turnover in vascular smooth muscle studied by ^{13}C-NMR. *J. Mol. Cell. Cardiol.* 23:512.

Wiseman, R.W., **Hardin, C.D.,** Kushmerick, M.J., and Dykens, J.A. (1991). ^{31}P-NMR assessment of specific impairment of creatine kinase function following hypoxia: implications for reperfusion injury. *FASEB J.* 5(5):A5255.

Zhang, C., **Hardin, C.D.,** Paul, R.J., and Kranias, E.G. (1991). Mechanisms of calmodulin activation of Ca^{2+}-uptake in plasmalemmal vesicles of porcine antral smooth muscle. *FASEB J.* 5(5):A7937.

Hardin, C.D., and Kushmerick, M.J. (1990). Glycogen turnover in vascular smooth muscle studied by ^{13}C-NMR. Society of Magnetic Resonance in Medicine IXth Annual Meeting. New York, NY.

Hardin, C.D., Wiseman, R.W., and Kushmerick, M.J. (1990). Control of oxygen consumption in sheep aorta. *FASEB J*. 4(3): A270.

Hardin, C.D., Raeymaekers, L., Casteels, R., and Paul, R.J. (1988). Comparison of endogenous and exogenous sources of ATP in supporting Ca^{2+}-uptake in isolated smooth muscle plasma membrane vesicles (PMV). *Biophys. J.* 53(2):347.

Hardin, C.D., Kranias, E.G., Raeymaekers, L., Steenart N.A.E., and Paul, R.J. (1988). Phosphorylation of a smooth muscle plasma membrane vesicle fraction is associated with an increased glycolytically supported calcium uptake. *FASEB J.* 2(4):A755.

Hardin, C.D. (1987). Myofibril bound fructoaldolase has an apparent equilibrium constant different than that measured in vitro. *Biophys. J.* 51(2):310.

Hardin, C.D., Raeymaekers, L., Wuytack, F., Casteels, R., and Paul, R.J. (1987). An endogenous glycolytic cascade can preferentially fuel Ca^{2+}-uptake in a plasma membrane vesicle preparation (PMV) of smooth muscle. *Fed. Proc.* 46(4):1096.

Paul, R.J., **Hardin, C.D.,** Wuytack, F., Raeymaekers, L., and Casteels, R. (1987). Glycolysis can fuel Ca^{2+}-uptake in a plasma membrane vesicular (PMV) preparation of smooth muscle. *Biophys. J.* 51(2):181.

Hardin, C.D., and Paul, R.J. (1986). Association of glycolytic enzymes with chemically skinned guinea pig *taenia coli*. *Fed. Proc.* 45:767.