

CURRICULUM VITAE

NAME: Gary David LOPASCHUK

DATE OF BIRTH: June 4, 1955

PRESENT ADDRESS: Cardiovascular Research Centre
423 Heritage Medical Research Centre
The University of Alberta
Edmonton, Alberta T6G 2S2
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PRESENT POSITION: Distinguished University Professor,
Departments of Pediatrics and Pharmacology
Faculty of Medicine & Dentistry, University of Alberta
AHFMR Scientist

CITIZENSHIP: Canadian

MARITAL STATUS: Married, three children

EDUCATION:

1973-1978 B.Sc. (Pharmacy), University of British Columbia

1978-1980 MSc (Pharmacology and Toxicology, Pharmaceutical Sciences),
University of British Columbia
Supervisor: Dr. S. Katz, Professor

1981 Mayo Clinic, Rochester, Minnesota, USA
Special Projects Associate, Cell Biology.
Supervisor: Dr. J.T. Penniston, Professor

1980-1983 PhD (Pharmacology and Toxicology, Pharmaceutical Sciences),
University of British Columbia
Supervisors: Dr. J.H. McNeill, Dean and Dr. S. Katz, Professor

1983-1985 Post-Doctoral Fellowship, The Milton S. Hershey Medical Centre
Department of Physiology, Hershey, Pennsylvania, USA
Supervisor: Dr. J.R. Neely, Professor

AWARDS:

- 1978 Warner-Lambert Research Fellowship
- 1980-1983 Canadian Heart Foundation Research Traineeship
Faculty of Pharmaceutical Sciences, University of British Columbia
- 1983-1985 Canadian Heart Foundation Post-Doctoral Fellowship
The Milton S. Hershey Medical Centre, Hershey, Pennsylvania
- 1985-1990 Canadian Heart Foundation Scholarship
The Hospital for Sick Children, Toronto, Ontario
and the University of Alberta.
- 1986 University of Toronto, Dean's General Award
- 1988 Canadian Cardiovascular Society, Young Investigator Award
- 1989-1994 Alberta Heritage Foundation for Medical Research Scholarship
- 1989 International Society for Heart Research
Runner-Up for Bing Award
- 1990 Awarded Tenure, Faculty of Medicine, University of Alberta
- 1993 Merck-Frost Research Award, Pharmacological Society of Canada
- 1993-1998 Medical Research Council of Canada Scientist Award
- 1994-1999 Alberta Heritage Foundation for Medical Research
Senior Scholarship
- 1999-2010 Alberta Heritage Foundation for Medical Research
Medical Scientist
- 2007 Fellow - Royal Society of Canada
- 2007 Canadian Cardiovascular Society Research Achievement Award
- 2008 Finalist - AsTech Awards
- 2008 Alberta Heritage Foundation for Medical Research
20-Year Funded Personnel Award
- 2008 BioAlberta 2008 Leadership in Science & Innovation Award
- 2010 Distinguished University Professor Award, University of Alberta
- 2014 Norm Alpert Research Achievement Award. European Section of the
International Academy of Cardiovascular Sciences. October 8-11, 2014.
Balatongyörök, Hungary.

POSITIONS HELD:

- 1985-1986 Assistant Professor of Paediatrics and Pharmacology
The Hospital for Sick Children and the Faculty of Medicine,
University of Toronto, Toronto, Ontario
- 1986-1990 Assistant Professor of Paediatrics
Faculty of Medicine, University of Alberta, Edmonton, Alberta
- 1987-1990 Assistant Professor of Pharmacology, Dept. of Pharmacology,
University of Alberta, Edmonton, Alberta
- 1987- Investigator, Cardiovascular Disease Research Group
- 1987- Scientific and Research Associate (Medical Director)
University of Alberta Hospitals
- 1990- Investigator, Muttart Diabetes Research Centre
- 1990-2000 Investigator, Lipid and Lipoprotein Research Group
- 1992- Investigator, Perinatal Research Centre
- 1990-1994 Associate Professor of Paediatrics and Pharmacology
University of Alberta, Edmonton, Alberta
- 1994- Professor of Paediatrics and Pharmacology
University of Alberta, Edmonton, Alberta
- 1995-2000 Director of Research, Department of Pediatrics
- 1997-2008 Director, Cardiovascular Research Group
- 2004-2008 Project Leader, CFI “Cardiovascular Translational Research Centre”
- 2006-2012 Scientific Director, Mazankowski Alberta Heart Institute
- 2010-2017 AHFMR Scientist Award
- 2010- Distinguished University Professor, University of Alberta
- 2014/10- Interim co-director Applied Research, Cardiovascular Translational Science Institute
University of Alberta
- 2015- President, International Society for Heart Research, North American Section
- 2015- Associate Chair of Research, Department of Pediatrics, Univ. of Alberta

GRANTS-IN-AID

1985-1988	Medical Research Council of Canada, \$38,000/annum "Coenzyme A regulation of Cardiac Metabolism"
1986	Medical Research Council of Canada, \$56,000, Equipment Grant
1986	Connaught Fund, University of Toronto, \$20,000 I declined this award because of move to the University of Alberta.
1986	Central Research Fund, U. of Alberta, \$7,500
1986-1990	Juvenile Diabetes Foundation International, \$240,000. "Fatty acid metabolism during ischemia in the diabetic rat heart"
1988-1989	Special Services, U. of Alberta Hospitals, \$29,000 "Protection of the Reperfused Myocardium"
1989-1991	Alberta Heritage Foundation for Medical Research, \$127,000, Establishment Grant.
1989-1992	Nordic Laboratories \$108,000, "TA-3090 in the Ischemic Heart"
1990-1998	Medical Research Council, \$79,000/annum "Energy Substrate Metabolism in the Ischemic and Non-ischemic heart"
1991-1992	Muttart Diabetes Research and Training Centre, \$9,000 "Arachidonic Acid Production and Phospholipids Sources in Islets", Co-Investigator: Dr. A. Rabinovitch
1991-1993	Canadian Diabetes Association, \$56,500/annum "Metabolic Protection during Myocardial Ischemia in the Diabetic"
1992-1993	Sigma-Tau, \$69,000 "Effects of Carnitine on Myocardial Metabolism in Hypertrophied Hearts"
1992-1995	Syntex (Contract), \$60,000/annum "Ranolazine Effects on Myocardial Metabolism"
1992-1993	Special Services Research Committee, \$3,000 "Use of Dichloroacetate in Cardiac Bypass Patients"
1993	Alberta Heritage Foundation for Medical Research, \$20,000 Equipment Grant.
1993-1996	CIBA-GEIGY, \$153,000/annum "Identify Novel Approaches towards Minimizing Injury in the Reperfused Ischemic Heart" Co-investigators: Drs. A. Clanachan and R. Shulz
1993-1995	Juvenile Diabetes Foundation International, \$66,000/annum, "Regulation of Fatty Acid Oxidation by Acetyl CoA Carboxylase in the Diabetic Rat Heart"
1994	Medical Research Council Equipment Grant \$225,000, Primary Investigator: Dr. Paul Armstrong, Co-investigators: Drs. Jugdutt, Kavanagh, Lopaschuk

- 1994 Alberta Heritage Foundation for Medical Research, \$30,000 equipment grant
Co-applicants: Drs. Michalak, Fliegel and Schulz
- 1995-1997 Tahio Pharmaceuticals, \$42,000
"Effects of MET-88 on myocardial energy metabolism"
- 1995-1999 Canadian Diabetes Association, \$60,000/annum "Regulation of Fatty Acid Oxidation by Acetyl CoA Carboxylase in the Diabetic Rat Heart"
- 1996-1997 Servier, \$112,000 "Effects of trimetazidine on myocardial energy metabolism"
- 1996-1997 CV Therapeutics, \$41,000 "Ranolazine effects on fatty acid oxidation"
- 1996-1999 Alberta Heart and Stroke Foundation, \$60,000/annum
"Myocardial Metabolism in the Fetus and Newborn"
- 1997-2000 CIHR, \$56,000/annum, "The Source and Fate of Protons in the Reperfused Heart."
Principal Investigator: Dr. G.D. Lopaschuk; Co-investigator: Dr. S. Clanachan
- 1998 Alberta Heritage Foundation for Medical Research, \$38,277 Equipment Grant
- 1998-2001 CIHR Group Grant, Core Budget \$147,000/annum "Cardioprotection during and following ischemia." Director: Dr. G.D. Lopaschuk
Members: Drs. R. Schulz, B. Jugdutt, M. Allard, R. Brownsey, A.S. Clanachan
- 1998-2003 CIHR, \$74,741/annum, "Energy Substrate Metabolism in the Ischemic and Non-ischemic heart"
- 1999-2001 Canadian Diabetes Association, \$56,000/annum
"Malonyl CoA Control of Fatty Oxidation in the Diabetic Rat Heart"
- 1999-2002 Alberta Heart and Stroke Foundation, \$51,000
"Energy Metabolism in the Newborn heart"
- 1999-2002 Metabolic Modulators Research Ltd., \$47,000, Characterization of Malonyl CoA decarboxylase,
- 2000-2001 Pfizer, \$89,000 "Biochemical and pharmacological characterization of cardiac 5' AMP – Activated protein kinase (AMPK-Kinase AMPKK)"
- 2001-2003 Canadian Diabetes Association, \$75,000/annum
"PPAR α control of cardiac fatty acid oxidation in the diabetic heart"
- 2001-2003 CIHR, \$108,000/annum "Control of glucose metabolism in the fetal and newborn heart"
Principal Investigator: Dr. I. Rebeyka
Co-investigator: Dr. G.D. Lopaschuk
- 2001-2003 CIHR Training Program "Strategic Training Program in Maternal-Fetal-Newborn Health" Director: Dr. David Olson
Members: Drs. Lopaschuk, Guilbert, Greer, Morrish, Archer and Mitchel

- 2001-2004 CIHR, Group Grant, \$184,231/annum “Perinatal Health and Disease”
Director: Dr. David Olson
Members: Drs. Lopaschuk, Guilbert, Greer, Morrish, Archer and Mitchel
- 2001-2004 CIHR, Core Budget \$210,000/annum “Cardioprotection during and following ischemia.” CIHR Group Grant: Director: Dr. G.D. Lopaschuk
Members: Drs. R. Schulz, B. Jugdutt, P. Light, K. Kavanagh, A.S. Clanachan, J. Dyck
- 2001-2006 CIHR, \$118,000/annum, “The Source and Fate of Protons in the Reperfused Heart.”
Principal Investigator: Dr. A.S. Clanachan, Co-investigator: Dr. G.D. Lopaschuk
- 2002 Alberta Heritage Foundation for Medical Research, \$37,500, Equipment Grant
- 2002 CFI, AHFMR, U. of Alberta Hospitals \$14,000,000
Heart and Stroke Translational Research Center
Director: Dr. S. Archer, Dr. Lopaschuk, Co-investigator
- 2002-2003 CIHR, Proof-of Principle, \$100,000
“Commercialization of novel compounds that stimulate glucose metabolism in the heart”
- 2002-2005 Alberta Heart and Stroke Foundation, \$51,000/annum
“Energy Metabolism in the Newborn heart” (Declined due to CIHR Award)
- 2002-2005 CIHR, \$84,000 / annum
“Energy Metabolism in the Newborn heart”
- 2002-2008 CIHR Training Program TORCH, \$213,000/annum
Director: Dr. P. W. Armstrong, Dr. Lopaschuk, Co- investigator
- 2003-2005 Canadian Diabetes Association, \$72,200/annum
“PPAR α Control of Cardiac Fatty Acid Metabolism in the Diabetic.”
- 2003-2008 CIHR, \$118,000/annum
“Energy Substrate Metabolism in the Ischemic and Non-Ischemic Heart”
- 2004-2009 CIHR, Core Budget \$236,000/annum, “Cardioprotection during and following ischemia.” CIHR Group Grant: Director: Dr. G.D. Lopaschuk, Members: Drs. R. Schulz, P. Light, B. Finegan, A.S. Clanachan, J. Dyck, PY Cheung, M. Allard
- 2004-2009 Canadian Foundation for Innovation, ASRIP \$14,800,000
Cardiovascular Translational Research Centre
- 2005-2010 CIHR, \$118,531/ annum "Energy Metabolism in the Newborn heart"
- 2006-2007 CIHR, \$97,500 “Altering hypothalamic malonyl CoA to treat obesity and insulin resistance”.
- 2006-2009 HSFC, \$57,000/annum “Cardiac lipotoxicity in obesity and diabetes”
- 2007-2012 CIHR, \$118,000/annum, “AMP-activated protein kinase effects on the source and fate of protons in the ischemic heart”

2008-2011	Canadian Diabetes Association, \$66,300/annum, “Hypothalamic arcuate malonyl CoA control of food intake and body energy balance”
2008-2013	CIHR, \$124,000/annum “Energy substrate metabolism in the ischemic and non-ischemic heart”
2009 - 2015	HSFA, \$47,500/annum “The metabolic basis of heart failure in obesity”
2012-2015	Canadian Diabetes Association, \$100,000/annum “Hypothalamic malonyl CoA control of obesity”
2012-2017	CIHR, \$124,000/annum “Energy metabolism in the newborn heart”
2014-2019	CIHR, \$125,600/annum, “Energy substrate metabolism in the ischemic and non-ischemic heart”
2014-2017	CFI - AB Enterprise and Advanced Education, \$391,584 Equipment Grant “Physiological and oxygen sensing suite for ex vivo and in vivo studies”
2015-2016	Women and Children’s Health Research Institute, \$50,000 “Acetylation control of glucose and fatty acid oxidation in the human newborn heart”
2016-2021	CIHR, \$98,000/annum, “Effect of obesity on cardiac energy metabolism in heart failure”

PROFESSIONAL ACTIVITIES:

Scientific Review Committees:

1986-1988	Member, Scientific Review Committee (Senior Personnel) Canadian Heart Foundation
1991-1992	Member of the Scientific Review Committee, Heart and Stroke Fdn. of Canada
1992-1997	Scientific Officer, Scientific Review Committee, Heart and Stroke Fdn. of Alberta
1993-1996	Chairman, Junior Personnel Review Committee, Heart and Stroke Fdn. of Canada
1993-1996	Member, Personnel Review Committee, Canadian Diabetes Association
1993-1996	Member, Studentship Committee, AHFMR
	Scientific Officer, Scientific Review Committee, Heart and Stroke Foundation of Alberta
1994-1999	Member, Cardiovascular A Grants Committee, Medical Research Council
1994-2000	Member, Cardiovascular B Grants Committee, Medical Research Council
1995-1999	Chairman, Research Grant Review Committee, Children Health Centre Foundation
1996-2001	Member, Grant Review Committee, Canadian Diabetes Association
1999-present	Member, CIHR University /Industry Grant Committee
	Chairman, Scientific Review Committee, Heart and Stroke Foundation of Canada
2000-2001	Member, NIH Study Section
1997-2002	Chairman, Scientific Review Committee, Heart and Stroke Foundation of Alberta
2004-2010	Member, NIH “Metabolism and Myocardial Ischemia” Study Section
2006-2008	Chair, Personal Program Review Task Force, Heart and Stroke Foundation of Canada
2008-2010	Member, CIHR/ HSFC IMPACT “Integrated and Mentored Pulmonary and Cardiovascular Training
2008-	Chair, Medical Advisory Board, Heart and Stroke Foundation of Alberta, N.W.T. and Nunavut
2009-2015	CIHR Proof of Principle Grant Review Panel
2011-2015	Member, Heart and Stroke Foundation of Canada Scientific Review Committee

Editorial Board Membership:

Editorial Board, Circulation Research (1997-)
 Editorial Board, J Clin Invest (2012-)
 Associate Editor, Am J Physiol, Heart (2011-)
 Associate Editor, Canadian Journal of Physiology and Pharmacology (1993-)
 Editorial Board, Cardiovascular Research (1995-2001, 2010-)
 Editorial Board, Biochim. Biophys. Acta (2008-)
 Editorial Board, Heart and Metabolism (1999-)
 Editorial Board, Cardiovascular Drugs and Therapy (2004-)
 Editorial Board, Am J Physiol, Endocrinology (2005-)
 Editorial Board, Basic Research in Cardiology (2009-)

**Journals to which paper reviews are routinely provided
(Approximately 120-150 papers reviewed/year):**

J. Biol. Chem.	Circ. Res.	Am. J. Physiol.
J. Clin. Invest.	Circulation	Science
Nature	Cell Metabolism	J. Mol. Cell. Cardiol.
Cardiovasc. Research	Heart Failure Reviews	Basic Res. Cardiol.
Can. J. Cardiol.	Diabetes	Diabetologia
Metabolism	Biochim. Biophys. Acta	Ped. Res.
J. Am. College Cardiol.	Biochemical J.	Mol. Cell. Biochem.
Heart and Metabolism	Can. J. Physiol. Pharmacol.	Obesity

Granting agencies to which reviews are routinely provided:

Canadian Institutes for Health Research	B.C. Health Research Foundation
Heart and Stroke Foundation of Canada	National Science Foundation
Canadian Diabetes Association	National Institutes for Health

Organizing/Strategic Planning Committee:

1992	Member, Heart and Stroke Foundation of Canada Career Development Strategic Planning Committee
1996-2002	Board of Directors, Heart and Stroke Foundation of Alberta
2000-2003	Member, Research Planning and Priorities Committee, Heart and Stroke Foundation of Canada Councillor, International Society for Heart Research
2001	Chairman, Organizing Committee, ISHR, Satellite Meeting of the XVII World Congress, Banff, AB.
2003-2007	Vice-Chair, Research Planning and Priorities Committee, Heart and Stroke Foundation of Canada
2012-2015	Member, Council on Mission: Priorities, Advices, Science and Strategy of the Heart and Stroke Foundation of Canada (CoMPASS)

Membership in Societies:

1978 -	College of Pharmacists of B.C. (retired registrar)
1979-	Registered, Pharmacy Examining Board of Canada
1984-	International Society for Heart Research (American Section)
1985-	International Society for Myochemistry
1988-	Pharmacological Society of Canada
1988-	Canadian Cardiovascular Society
1988-	Western Pharmacological Society
2001	Fellow, American Heart Association, Basic Science Council

2009- Obesity Society

University Committees:

1990- Pediatric Cardiology Resident Training Committee
 1990-1995 Chairman, Northern Alberta Institute of Technology
 Lab Sciences Curriculum Advisory Committee
 1992-1996 Member, Health Sciences Animal Welfare Committee, Faculty of Medicine
 1992 Co-chairman, U. of A. Hospitals, Strategic Planning
 Sub-committee on Research in Cardiac Sciences
 1992-2008 Planning and Priorities Committee, Perinatal Research Centre
 Member, Faculties Council Library Committee
 Chairman, Pediatric Resident Research Committee
 1998-2007 Member, Medical Sciences Graduate Program Committee
 1998-2005 Graduate Student Coordinator, Department of Pediatrics
 2003-2006 Member, Faculty Evaluation Committee
 2004- Representative, Provost Office for Search and Selection Committee
 2005-2007 Member, Research Advisory Committee, Faculty of Medicine and Dentistry
 2008-2009 Member, Dean's Search and Selection Committee, Faculty of Medicine and Dentistry
 2008-2010 Member, Planning and Priorities Committee, Faculty of Medicine and Dentistry
 2010- Scientific Advisory Committee, Women's and Children's Health Research Institute
 2011-2012 Member, Faculty Research Committee
 2011-2012 School Research Lead (Interim), Cardiac Sciences, Faculty of Medicine & Dentistry
 2014- Interim Director (Basic Sciences), Cardiovascular Translational Sciences Institute

Graduate Students Supervised:

Name	Degree Awarded	Funding	Present position
Mr. Tino D. Piscione Univ. of Toronto (Co-supervised with Dr. P. Olley and Dr. F. Coceani)	MSc 1987	Grant	Pediatric Nephrologist Hosp. for Sick Children
Dr. Stephen R. Wall Univ. of Alberta	PhD 1988	AHFMR Studentship	Research Associate London, Ontar
Dr. Tom Broderick Univ. of Alberta	PhD 1993	CDA Studentship	Professor Midwestern U. AZ
Dr. Maruf Saddik Univ. of Alberta	PhD 1993	MRC -Fellowship AHFMR-Studentship	Pathologist, Edmonton
Dr. Jim Gamble Univ. of Alberta	PhD 1996	HSFC Studentship	Research Coordinator Baxter Laboratories
Dr. Brett Schonekess Univ. of Alberta	PhD 1996	AHFMR Studentship	Research Consultant, Calgary, Alberta
Dr. Darryl Belke	PhD 1997	HSFC	Associate Professor University of Calgary
Dr. Olefemi Makinde	PhD	AHFMR	Research Associate,

University of Alberta	1998	Studentship	Chicago
Dr. Chad Lund University of Ottawa	MSc	Perinatal Research	Cardiologist, Ottawa
Dr. Liu Que	PhD 2000	PhD scholarship	Research Scientist, Chemtex, San Fransico
Dr. Michael Steinmetz Germany	Exchange Student 2000-2001		Medical Resident
Dr. Laura Atkinson	PhD 2002	AHFMR Studentship	Research Associate, Simon Fraser University
Dr. Arzu Onay	PhD 2003	AHFMR Studentship	Associate Professor, U. of Ankara, Turkey
Dr. Emily Manning	MSc 2003	Research Grant	Medical Resident, Cambridge, UK
Dr. Judith Altarejos	PhD 2004	CIHR Studentship	Asst. Professor, Burnham Institute, Orlando
Dr. Teresa Hopkins	PhD 2005	AHFMR Studentship	Patent Law, Boston
Ms. Maysa Taha	MSc 2007	Research Grant	Public Health Program, UofA
Dr. Clifford Folmes	PhD 2008	HSF/AHFMR	Asst. Professor Mayo Clinic, Scottsdale, Az.
Dr. John Ussher	PhD	AHFMR	Asst. Professor University of Alberta
Ms. Lene Axelson	PhD	Zealand Pharma	Graduate Student
Mr. Virgilio Cadete	MSc	Research Grant	PhD student University of Saskatoon
Ms. Anna Lam	MD		Graduate student
Dr. Victoria Lam	MD/ PhD 2011	AHFMR part time Studentship	Graduate student
Ms. Vaninder Sidhu	MSc 2013	Motyl Studentship	Graduate student
Mr. Osama Abo Alrob	PhD 2014	Research Grant	Assistant Professor, Jordan
Mr. Tariq Al-Tamini	PhD	Research Grant	Graduate Student

Ms. Natasha Fillmore	PhD	AIHS Studenship	Graduate Student
Mr. Ken Miller	MSc	Research Grant	Graduate Student
Ms. Sonia Rawat	MSc	Research Grant	Graduate Student
Ms. Kim Ho	MSc	Pediatrics	Graduate Student

Post-Doctoral Fellows Supervised:

Name	Period Trained	Funding	Present Position
Dr. Rick Schulz (Co-supervised with Dr. P.M. Olley)	1991-1993	MRC / AHFMR Fellowships	Professor U. of Alberta
Dr. Toshiyuki Itoi	1991-1994 Post-doctoral Fellow	HSFC	Professor Kyoto Prefectural University of Medicine
Dr. Z. el Alaoui Talibi (Co-supervised with Drs. Clanachan and Schulz)	1993	Research Grant	Professor, Morocco
Dr. Bin Liu (Co-supervised with Drs. Clanachan and Schulz)	1994-1996	Research Grant	Computer Consultant Private Business
Dr. Will Ford (Co-supervised with Drs. Clanachan and Schulz)	1994-1996	Research Grant	Research Associate, London, UK
Dr. John Gillespie	1995	Research Grant	Research Technician Dundee, Scotland
Dr. Naomi Kudo	1994-1995	HSFC Post-doctoral fellow	Associate Professor Teikyo University
Dr. Jason Dyck	1996-1999	HSFC/AHFMR Fellowship	Professor and Director, Cardiovascular Research U. of Alberta
Dr. M. Taniguchi	1996-1998	Research Grant	Associate Professor, Cardiology Jeiki University, Tokyo
Dr. Paul Kantor	1996-1999	AHFMR Clinical Scholarship	Professor, University of Toronto
Dr. Jun Sakamoto	1997-1999	Research Grant	Assistant Professor. Cardiology, Sapporo

Dr. Peter Brindley	1999-2000	HSFC Fellowship	Associate Professor, Specialist, ICU U. of A. Hospital
Dr. Fiona Campbell	1999-2002	AHFMR Fellowship	Research Associate U. of Glasgow, Scotland
Dr. Nanda Sambandam	2000-2003	AHFMR Fellowship	Assistant Professor, Washington U., St Louis
Dr. Martin Spoor	2000-2003	AHFMR	Clin. Fellowship Assistant Professor, U. of Michigan, Ann Harbour M (deceased 2008)
Dr. D. Morabito	2001-2005	AHFMR/HSF Fellowship	Research Associate
Dr. Mohammad Askar	2003-2005	Research Grant	Research Associate
Dr. Anna Noga (co-sup)	2003-2007	AHFMR Fellowship	Research Associate
Dr. Christopher Lee	2003-2007	AHFMR Fellowship	MD
Dr. Nayna Manga	2005-2006	Research Grant	Post-doctoral Fellow
Dr. A. Palaniyapan	2005-2007	Research Grant	Research Associate
Dr. Wendy Keung	2006-2011	HSFC/ AHFMR Fellowship	Asst. Professor, Hong Kong
Dr. Wei Wang	2006	AHFMR Clinical Fellowship	Post-doctoral Fellow
Dr. Tatsujiro Oka	2006-2009	Research Grant	Asst. Professor University of Kyoto
Dr. Su Gao	2007-2010	HSFC	Research Associate
Dr. Lyan Zhang	2007-2011	AHFMR	Research Associate
Dr. Jagdip Jaswal	2008-2012	Mazankowski Alberta Heart Institute	AIHS
Dr. V. Samokhvalov	2008-2012	AHFMR	Research Associate
Dr. Alda Huqi	2010	Research Grant	Asst. Professor, Cardiology Pisa Italy
Dr. Jun Mori	2010-2013	Research Grant	Asst. Professor, Kyoto University
Dr. S. Sankaralingam	2011- 2014	AIHS	Asst. Professor, Qatar School of Pharmacy, Doha, Qatar
Dr. Abhishek Gupta	2014-2015	Research Grant	Post-doctoral Fellow
Dr. Arata Fukushima	2014-	Research Grant	Post-doctoral Fellow

Invited Lectures:

- 1984 Cardiovascular Research Focus, The Hospital for Sick Children
 1985 Division of Pharmacology, University of British Columbia
 1986 Department of Pharmacology, University of Alberta
 1987 Byk Gulden Laboratories, Konstanz, West Germany
 1988 Canadian Cardiovascular Society, Montreal, Quebec
 1989 International Society for Heart Research, Tokyo, Japan Osaka Medical School, Osaka, Japan
 1989 Kyoto Medical School, Kyoto, Japan
 1989 Department of Physiology, University of Saskatchewan
 1990 Nordic Laboratories, Scottsdale, Arizona
 1990 Department of Pharmacology, Dalhousie University, Halifax
 1991 Current Concepts in Carnitine Research, Atlanta, Georgia
 1991 Third International Symposium on Lipid Metabolism in the Normoxic and Ischemic Heart, Rotterdam, The Netherlands.
- 1991 Cardiovascular Research Group, University of Calgary, Calgary, AB
 1991 National Association of Extrahospital Cardiologists, Rome, Italy
 1992 Prassus Pharmaceuticals (Jan.), Milan, Italy
 1992 Prassus Pharmaceuticals (Sept.), Milan, Italy
 1992 International Workshop of Energy Production in Hypertrophied Hearts, Beaune, France
 1992 Outreach 92, Terrace, B.C.
 1992 Veterans Administration Hospital, Portland, Oregon
 1992 Ciba-Geigy, Summit, New Jersey
 1992 Cardiovascular Group, Winnipeg, Manitoba
 1992 Italian Cardiology Society Meeting, Rome, Italy
 1993 International Society for Heart Research, European Section, Jerusalem, Israel
 1993 European Congress of Cardiology, Nice, France
 1993 Canadian Federation of Biological Sciences, Windsor, Ontario
 1993 British Cardiovascular Society, Edinburgh, Scotland
 1994 Cardiovascular Research Group, Calgary
 1994 Division of Cardiology, U. of Texas Medical School
 1994 International Symposium on Heart Failure, Winnipeg
 1994 International Society for Heart Research, London, Ontario
 1995 European Congress of Cardiac Nephrology, Assisi, Italy
 1995 Pulmonary Research Group, St. Paul's Hospital, Vancouver, B.C.
 1995 Department of Physiology, University of Ottawa, Ottawa, Ont.
 1995 International Society for Heart Research World Congress Prague, Czech Republic
 1995 Satellite Meeting of XV ISHR, Venice, Italy
 1995 Pathology Rounds, St. Paul's Hospital, Vancouver, B.C.
 1996 Department of Zoology, Brigham Young University, Provo, Utah
 1996 Cardiology Rounds, U. of Texas Medical School, Houston
 1996 Pediatric Rounds, B.C. Children Hospital, University of British Columbia
 1996 50th Anniversary Celebration of the Faculty of Pharmaceutical Sciences, UBC
 1996 Cardiology Rounds, Yale University
 1996 Cardiology Rounds, Riyadh Medical Centre, Saudi Arabia, Saudi Arabia
 1996 International Symposia on Myocardial Energy Metabolism, Buhl, Germany
 1996 International Society for Heart Research (Japan Section), Symposia on Ischemic Heart
 1997 International Society for Heart Research (American Section), Vancouver, Canada, Symposia on Adaptation of Energy Metabolism

- 1997 International Society for Heart Research (European Section), Versailles, France, Symposia on Regulation of Energy Metabolism.
- 1997 Dept. of Biochemistry, Case Western Reserve University, Cleveland Ohio
- 1997 Cardiovascular Research Group, University of Calgary, Calgary
- 1997 Dept. of Emergency Medicine, Carolinas Medical Center, Charlotte NC
- 1997 Dept. of Physiology, Case Western University, Cleveland Ohio
- 1997 Canadian Cardiovascular Society, Winnipeg
- 1997 Department of Nutrition, University of Montreal
- 1998 25th Anniversary, Egyptian Society of Cardiology, Cairo, Egypt
- 1998 XIII World Congress of Cardiology, Rio de Janeiro, Brazil
- 1998 VIth Congress of Czech Society of Cardiology, Prague, Czech Republic
- 1998 Experimental Biology '98, San Francisco, CA
- 1998 XVth World Congress of the International Society for Heart Research, Rhodes, Greece
- 1998 Philippine Heart Association, Manila, Philippine
- 1998 Vastorel Symposium, Servier International, Beijing, China
- 1998 International Society for Heart Research, XX Annual Meeting of the American Section, Ann Arbor, Michigan
- 1998 2nd International Congress, Polish Cardiac Society, Katowice, Poland
- 1998 Novonordisk, Copenhagen, Denmark
- 1998 Vastarel Symposium, Paris
- 1998 Hormones and the Heart, Naples, Italy
- 1998 International Conference on Diabetes and the Heart and Vasculature, Winnipeg, Manitoba.
- 1999 Mechanism of action of trimetazidine. Cardiologists Symposia, Beijing, China, January 30,
- 1999 Altering fatty acid oxidation in the heart: A target for pharmacological Intervention. February 25, 1999. Novartis, Newark NJ.
- 1999 Can one change cardiac cell metabolism? March 19, 1999, Paris, France. Societe Francaise de Cardiologie Annual Scientific Sessions.
- 1999 Abnormal myocardial fatty acid metabolism in the ischemic heart. March 28, 1999. Tokyo, Japan, Circulation 9, Japan.
- 1999 Mechanism of action of trimetazidine. March 21, 1999, Istanbul, Turkey 3rd Academic Cardiology Colloquim.
- 1999 Control of fatty acid oxidation in the heart. April 13, 1999, Bristol Mayers Squibb, Princeton, NJ
- 1999 Treatment of ischemic heart disease. April 29, 1999, Hong Kong, Hong Kong College of Cardiology Seminar
- 1999 Malonyl CoA control of fatty acid oxidation in the heart. May 6, 1999, Dallas, TX, Symposia and Training: 13 C in metabolic research.
- 1999 Abnormal control of fatty acid oxidation in the diabetic rat heart. June 4, 1999, Winnipeg, MB, International Conference on diabetes and Cardiovascular Disease
- 1999 Malonyl CoA control of fatty acid oxidation in the reperfused ischemic heart. August 11, 1999, Pfizer, Groton, CT.
- 1999 Optimizing cardiac metabolism in ischaemic heart disease: a single explanation. August 28, 1999, Barcelona, Spain, XXIst European Congress of Cardiology.
- 1999 Transcriptional control of signaling molecules in fatty acid oxidation. Cardiovascular Seminars, 72nd Scientific Session of the American Heart Association, Atlanta, GA. November 7-11, 1999.
- 1999 Optimizing energy metabolism in the ischemic heart. December 8, 1999. Edmonton, Alberta, Cardiology Grand Rounds
- 2000 Metabolic agents. A new approach in treating ischaemic heart disease. The Caribbean Cardiac Society, XVth Caribbean Cardiology Conference, Paradise Island, Bahamas. July 20-23, 2000
- 2000 Cardiac metabolism. The Diabetic Heart. The Caribbean Cardiac Society, XVth Caribbean Cardiology Conference, Paradise Island, Bahamas. July 20-23, 2000

- 2000 Chantilly, France, April 27-29, 2000, International Workshop on Cardiac Metabolism
- 2000 Lahore/Karachi/Peshwar/Faisalabhad, Pakistan, May 20-25, 2000. Cardiac Metabolism Lectures on "Protecting the ischemic heart by optimizing energy metabolism"
- 2000 Pharmacology Dept. Seminar, Case Western. Cleveland, Ohio, September 27.
- 2000 AMPK Symposium. December 3. Boston, MA.
- 2000 Rome, Italy, December 18, Annual Congress of the Italian Cardiology Society
- 2000 Conference on "Regulation of fatty acid oxidation and ketogenesis. Brighton, England, December 20.
- 2001 Cardiology Residents, University of Alberta, January 10.
- 2001 Collip Club, Faculty of Medicine, University of Alberta, February 6.
- 2001 Pharmacology 2001 University of British Columbia, Vancouver BC, March 26.
- 2001 Cardiovascular Research Group, University of Alberta, March 29.
- 2001 Westlink Innovations, Edmonton Alberta, April 25.
- 2001 National Heart Association of Malaysia, Kuala Lumpur, Malaysia, May 13.
- 2001 Muttart Diabetes Research and Training Centre, U. of Alberta, June 11.
- 2001 Satellite Meeting, XVII World Congress of the International Society of Heart Research, Banff, Alberta. July 5.
- 2001 XVII World Congress of the International Society of Heart Research, Winnipeg Manitoba, July 7.
- 2001 56th Congress of the Brazilian Society of Cardiology, Goianna, Brazil, October 2.
- 2001 Department of Pharmacology, Dalhousie University, Halifax, November 19.
- 2002 Pfizer, Sandwich, Kent, UK. January 9, 2002. Cardiovascular energy metabolism relevance to ischemic heart disease.
- 2002 Division of Endocrinology and Metabolism, University of Pittsburgh, PA. Malonyl-CoA control of fatty acid oxidation in the ischemic and non-ischemic heart. January 17, 2002.
- 2002 Division of Physical Education, University of Alberta. Cardiac adaptation (inadaptation) to myocardial ischemia. January 22, 2002.
- 2002 Metabolic modulator: How to help mend a sick newborn heart. Banff, Western Perinatal Meeting, Feb. 16, 2002.
- 2002 Peroxisomal proliferator activated receptor control of fatty acid oxidation in the heart. Merck Laboratories, Rutherford NJ. Feb. 25, 2002.
- 2002 Metabolic Modulation in the management of coronary artery disease. Cardiology at the Limits. Cape Town, South Africa, April 5-8, 2002
- 2002 Metabolic Management of Coronary Artery Disease to the Heart Failure Group, Duke Medical School, Durham, NC. April 18, 2002
- 2002 Inhibiting fatty acid oxidation as a therapeutic approach to treating ischemic heart disease. Hopitaux Universitaire de Geneve, Geneva, Switzerland. April 25, 2002.
- 2002 Modulating energy metabolism as an approach to treating coronary artery disease. London ON, June 6, 2002.
- 2002 How does glucose metabolism affect viability studies. PET/CT Imaging Symposium, London ON, June 7, 2002.
- 2002 European Association for the Study of Diabetes, Budapest, Hungary, Sept. 1-5, 2002
- 2002 AMPKK and AMPK control of fatty acid oxidation in the ischaemic heart. 2nd International Symposium on AMP-activated protein kinase. Dundee, Scotland, Sept. 12-14, 2002.
- 2002 Etiology and mechanisms of heart failure: Genetic and environmental determinants. Canadian Cardiovascular Society, Edmonton, October 26, 2002.
- 2002 Frontiers of Congenital Cardiac Science, Edmonton, October 26, 2002.
- 2002 Mode of action of trimetazidine and other new metabolic agents in the treatment of ischemic heart disease. Low Output Syndrome revisited, Amsterdam, The Netherlands, November 2002.
- 2003 Myocyte Metabolic Pathways. Cardiac Molecular Imaging Symposium, Ottawa, March 27-28.
- 2003 What's going on in the cell? Cardiac Molecular Imaging Symposium, Ottawa, Mar. 28.

- 2003 Cardiac Metabolism and metabolic consequences of ischemia cytoprotective role of preductal MR. Czech Cardiovascular Society, Prague, Czech Republic. May 14-15, 2003.
- 2003 PPAR α control of fatty acid oxidation in the heart and its implication in cardiac ischemia. 46th Annual Meeting, Canadian Federation of Biological Societies. Ottawa, June 11-15, 2003.
- 2003 Role of fatty acid oxidation in cardiac dysfunction in the ischemic and failing heart. Targeting Metabolism in Cardiovascular Disease: From Gene Expression to Clinical Practice. Societ Heart and Vascular Metabolism. Freiburg, Germany, June 18-20, 2003.
- 2003 Optimizing energy metabolism as a novel approach to treating ischemic heart disease. 7th International Symposium on Pharmaceutical Sciences. Ankara, Turkey, June 24-27, 2003.
- 2003 Malonyl CoA control of fatty acid oxidation in the ischemic heart. XXV Annual Meeting of the International Society for Heart Research (ISHR). Mystic, Connecticut, June 28-July 1, 2003.
- 2003 Potential benefits of promoting glucose oxidation in heart failure – Ranolazine? Heart failure Society of America, 7th Annual Scientific Meeting. Las Vegas, Nevada, September 21-24.
- 2003 Alterations in fatty acid oxidation in the ischemic heart contribute to myocyte injury. 20th Japanese Section of ISHR, Jikei, Japan.
- 2003 Optimizing energy metabolism as an approach to treating myocardial ischemia. Chugai Pharmaceutical Co., Sendai, Japan, November 25th.
- 2004 A diagnostic model for evaluating disease and diabetes. Efficacy Models for Natural Health Product Workshop. Banff, Feb. 9-10, 2004
- 2004 How do you structure your proposal? 3rd CIHR TORCH Program Workshop, Banff, Feb. 6.
- 2004 Role of malonyl CoA in mediating the metabolic abnormalities seen in obesity and diabetes. International Society for Heart Research, American Section 26th Annual Meeting, Cancun, Mexico, May 2-5, 2004.
- 2004 National Research Forum for Young Investigators in Circulatory and Respiratory Health, Winnipeg, May 6-8, 2004.
- 2004 Sapporo University, Sapporo, Japan, Aug. 2004.
- 2004 Chair; Metabolic dysfunction in the diabetic heart. XVIII International Society for Heart Research, Brisbane, Australia, Aug. 7-11, 2004.
- 2004 Inhibiting fatty acid oxidation as a novel therapeutic approach to treating ischaemic heart disease. Satellite Meeting, XVIII International Society for Heart Research, Cape Town, South Africa, Aug. 13-16, 2004.
- 2004 Modulation of energy metabolism as an approach to treating heart failure. Satellite Meeting, XVIII International Society for Heart Research, Cape Town, South Africa, Aug. 13-16, 2004.
- 2004 Inhibition of fatty acid oxidation as a therapeutic target in ischemic heart disease and the failing heart. Society for Heart and Vascular Metabolism, Montebello, Quebec, Sept. 26.
- 2004 Metabolic dysregulation as cause for contractile dysfunction of the heart in obesity and diabetes: Is this a potential target for therapy? Heart Failure Society of America, Toronto, Sept. 2004
- 2004 Cardiac Excellence in Edmonton. Rotary Club Luncheon, Edmonton.
- 2004 Urban Spirits Dinner, Rotary Club, Edmonton.
- 2004 Regulation of glucose and fatty acid oxidation in the heart. Metabolic Alterations and Disease: a Mitochondrial Link. University of Coimbra, Portugal, Dec. 6, 2004.
- 2004 AMP-activated protein kinase control of glucose and fatty acid metabolism in the ischemic heart. Metabolic Alterations and Disease: a Mitochondrial Link. University of Coimbra, Portugal, Dec. 6, 2004.
- 2004 Targets for modulation of fatty acid oxidation in the heart. Metabolic Alterations and Disease: a Mitochondrial Link. University of Coimbra, Portugal, Dec. 6, 2004.
- 2005 Characterization of AMPK in the heart. Merck, Rahway, NJ. June 7, 2005.
- 2005 Metabolic therapy in diabetic stress. NATO Advances Research Workshop “Stress Induced Biochanges in the Heart: From Genes to Bedside”. Antalya, Turkey, Feb. 2-7,

- 2005 Malonyl CoA control of cardiac fatty acid oxidation: a therapeutic target for the treatment of myocardial ischemia and diabetes. Cardiovascular Research Institute, University of Maastricht, Maastricht, The Netherlands. March 9, 2005.
- 2005 Malonyl CoA decarboxylase inhibition improves cardiac insulin sensitivity. 25th European Section Meeting, Tromso, Norway, June 22-26, 2005.
- 2005 Role of fatty acid oxidation in modulating cardiac lipotoxicity and insulin resistance. Novartis, July 11, 2005.
- 2005 Optimizing cardiac fatty acid and glucose metabolism as an approach to treating heart failure. The Failing Heart Under Stress: multifactorial Aspects of Acute and Chronic Heart failure. Amsterdam, The Netherlands, Nov. 20-22, 2005.
- 2005 Energizing the research environment of the Mazankowski Alberta. Heart Institute. Faculty of Medicine, University of Alberta. December 2005.
- 2006 Inhibiting malonyl CoA decarboxylase as an approach to treating obesity. Eli Lilly, Indianapolis. January 9, 2006.
- 2006 Optimizing energy metabolism as an approach to treat ischemic heart disease. Icapture, University of British Columbia, Vancouver. January 13, 2006.
- 2006 Cellular malonyl CoA decarboxylase inhibition as an approach to treating insulin resistance, obesity and ischemic heart disease. Merck, Newark. March 1, 2006.
- 2006 Inhibiting malonyl CoA decarboxylase as an approach to decreasing cardiac fatty acid oxidation: A novel approach to treat ischemic heart disease. Duluth, Minnesota. March 14, 2006.
- 2006 Metabolic approach to the treatment of ischemic heart disease. New imperatives in the management of cardiovascular disease: the latest evidence. Scientific Research Meeting of Servier International. March 26, 2006. Nagoya, Japan..
- 2006 Molecules to market to better health. 3rd Annual National Research Forum for Young Investigators in Circulatory and Respiratory Health. May-7, Winnipeg.
- 2006 University of Alberta Spin-off Success: Metabolic Modulators Research Limited. Metro Edmonton Health Industry Association. May 2, 2006.
- 2006 Tomorrow's Research Cardiovascular Health Professionals: Mentoring the Next Generation of Health Researchers. 3rd Annual National Research Forum for Young Investigators in Circulatory and Respiratory Health. May-7, Winnipeg.
- 2006 Alterations in fatty acid oxidation in the failing heart. 28th International Society for Heart Research. June 13-16, Toronto.
- 2006 Optimizing energy metabolism to treating ischemic heart disease. Vastinan Symposia. July 8-12, Seoul, Korea.
- 2006 Metabolic modulation in cardiac myocytes as a pharmacological approach to treat cardiac ischemia and heart failure. 15th World Congress of Pharmacology. June 6, Bei
- 2006 The key role of malonyl CoA in regulating cardiac energetics. 6th International Muscle Energetics Conference, July 22-27, Banff, Alberta.
- 2006 AMPK signaling during cardiac stress: potential therapeutic targets. Society for Heart and Vascular Metabolism 4th Annual Meeting. Cardiac Energy Metabolism in Heart Failure: from concepts to therapies. September 6-9, 2006, Semiahmoo, Washington.
- 2006 The AMPK/malonyl-CoA axis as a therapeutic target for the ailing heart. Heart Failure Society of America 10th Annual Scientific meeting. September 10-13, 2006, Washington.
- 2006 Critical role of malonyl CoA in the regulation of cardiac response to stress. ACSM Conference on Integrative Physiology of Exercise. September 27-30, 2006, Indianapolis, Indiana.
- 2006 Optimizing energy metabolism as a novel approach to treat ischemic heart disease and heart failure. Global Conference on Heart Health and Disease. October 12-15, 2006, Winnipeg.
- 2006 Grant applications and the "Frontrunner's Dynamic" – What will make the reviewers labbergasted? Canadian Cardiovascular Society. October 21-25, Vancouver.
- 2006 Role of AMPK and malonyl CoA in hypothalamic control of obesity. 8th International Symposium, Merck-Frosst/CIHR Research Chair in Obesity. AMP-activated protein kinase in

- obesity: metabolic node and beyond. November 3, Quebec.
- 2006 Optimizing energy metabolism as a novel approach to treat cardiac ischemia and heart failure. Cardiac Sciences Group, Oxford University, Oxford UK.
- 2006 AMPK in the heart – Regulation of energy status. 197th Meeting of the Society for Endocrinology. November 6-7, London UK.
- 2006 Targeting malonyl CoA decarboxylase as a treatment for both heart disease and obesity. Pfizer. December 4, Groton, Connecticut.
- 2007 Increasing cardiac malonyl CoA levels protects the ischemic heart by decreasing fatty acid oxidation. International Symposium on “Recent Advances in Cardiovascular Sciences” (RACS), February 14, New Delhi, India
- 2007 Increasing cardiac malonyl CoA level protect the ischemic heart by decreasing fatty acid oxidation. Heart Research 2007 (ISHR), February 17, Bikaner, Rajasthan
- 2007 High fat diet in mice – identification of MCD inhibitors. Pharmacology and Therapeutics Conference. March 4-6, Banff.
- 2007 The cardiac metabolic protection with 3 KAT inhibitor in IHD. April 18 – 21, Nusa Dua, Bali, Indonesia
- 2007 Obesity, the Cardiovascular System and the Brain. 2007 Western Obesity Summit, Kananaskis, May 6-8
- 2007 The changing scenario in chronic heart disease and its management. 20th Spring Congress of Korean Diabetes Association, Seoul, Korea May 10-12.
- 2007 The changing scenario in diabetic heart and its management. 20th Spring Congress of Korean Diabetes Association, Seoul, Korea, May 10-12.
- 2007 Metabolic dysregulation as a cause for dysfunction of the heart in diabetes and obesity: Is this a potential target for therapy? 20th Spring Congress of Korean Diabetes Association, Seoul, Korea, May 10-12.
- 2007 Carnitine in myocardial ischemia; experimental evidence. XIX World Congress of the ISHR, June 20-22, Padova-Abano, Italy
- 2007 Alterations in energy metabolism, in the ischemic and failing heart. XIX World Congress of the ISHR, June 25, Bologna, Italy
- 2007 Malonyl CoA Decarboxylase inhibition as an approach to treat obesity and ischemic heart disease. 2nd annual Metabolic Syndrome Oct 18-19, Boston, MA
- 2007 Optimizing energy metabolism as a novel approach to treat cardiac ischemia and heart failure. Canadian Cardiovascular Society Congress October 21-24, Quebec City, Quebec
- 2008 Inhibiting Malonyl COA Decarboxylase as an approach to limiting myocardial infarct size. Case Western Reserve University January 7, Cleveland, OH
- 2008 Inhibiting Malonyl-CoA Decarboxylase as an approach to treating ischemic heart disease and obesity. University of Alberta, January 16, Edmonton, Alberta
- 2008 Targeting fatty acid oxidation as an approach to treating ischemic heart disease and heart failure. Southern Regional Meeting February 21 -23, New Orleans, Louisiana
- 2008 Inhibiting Malonyl CoA Decarboxylase as a target for treating ischemic heart disease. NATO Advanced Research Workshop, May 12-16, Istanbul, Turkey.
- 2008 Inhibition of fatty acid oxidation as an approach to treat ischemic and failing heart. International Symposium on Myocardial Protection – From Lab to Man, May 20-21, Irbid & Amman, Jordan.
- 2008 Inhibition of fatty acid oxidation as an approach to treat ischemic heart disease and heart failure. Molecular Function & Imaging Symposium, June 19-20, Ottawa, Ontario.
- 2008 The role of AMP-Malonyl CoA Axis in mediating myocardial ischemic injury. Society for Heart and Vascular Metabolism, June 29 – July 1, Boston Massachusetts.
- 2008 Inhibiting malonyl CoA decarboxylase as an approach to treating ischemic heart disease. International Academy of Cardiology 14th World Congress on Heart Disease Annual Scientific Sessions, July 26-29, Toronto, Ontario
- 2008 Myosin light chain kinase is a novel 5' AMP activated protein kinase kinase (AMPKK) in the

- heart. AMPK in Sickness and Health: From Molecule to Man, August 10-15, Snekkersten, Denmark
- 2008 Obesity, Nutrition and Metabolism in Heart Failure. Heart Failure Society of America, September 21-24, Toronto, Ontario
- 2008 Targeting Malonyl CoA inhibition of mitochondrial fatty acid uptake as an approach to treat cardiac ischemia. Mitochondrial Biology in Cardiovascular Health & Disease Conference, October 6-7, Bethesda, Maryland
- 2009 Inhibiting fatty acid oxidation as an approach to treat ischemic heart disease and heart failure. Borun Lectureship, UCLA, January 15-16, Los Angeles, California
- 2009 Energy metabolic phenotype of the cardiomyocyte during development and differentiation. 6th International Ascona Workshop on Cardiomyocyte Biology. April 26, Ascona, Switzerland
- 2009 Pyruvate dehydrogenase kinase inhibition as an approach to treat ischemic heart disease, heart failure and diabetes. April 28, Roche, Basel, Switzerland
- 2009 Inhibition of malonyl CoA decarboxylase as an approach to treat ischemic heart disease. 2nd International Meeting on Myocardial Protection from Bench to Clinical Application. May 2-5, Irbid & Amman, Jordan.
- 2009 Cardiac energy metabolism in obesity. International Society for Heart Research (ISHR) North American Section meeting. May 26-29, Baltimore, Maryland, U.S.A.
- 2009 The fetal heart, the embryonic stem cell and tumorigenic cells: Cousins in phenotype of energy metabolism. University of Alberta, June 4, Edmonton, Alberta.
- 2009 Treating ischemic heart disease that inhibits fatty acid oxidation. July 14, Roche Nutley, New Jersey.
- 2009 Inhibition of malonyl CoA decarboxylase as an approach to treat heart failure and ischemic heart disease. Recent Advancement in Cardiovascular Biology and heart Failure Symposium. China, July 29- 31, Shanghai, China.
- 2009 Imaging of the left ventricular remodeling and function. Canadian Cardiovascular Congress, October 24, Edmonton, Alberta.
- 2010 Targeting Malonyl CoA as an approach to treat heart disease, obesity and diabetes. Preventative Medicine, Seminars in Lipoprotein Metabolism, Atherosclerosis & Nutrition. Columbia University, May 12, New York, NY.
- 2010 PGC1 and mitochondrial function in heart failure. World Congress of Cardiology Scientific Sessions, June 16-20, Beijing, China
- 2010 Inhibition of Malonyl CoA Decarboxylase prevents adverse cardiac remodeling post-infarction. International Academy of Cardiology, 15th World Congress on Heart Disease, July 24-27, Vancouver, B.C.
- 2010 Heart Research at the Maz. A Night at the Maz Lecture Series #1, Mazankowski Alberta Heart Institute, October 19, Edmonton, AB
- 2011 Treating heart failure by optimizing cardiac energy metabolism. Heart & Stroke/ Richard Lewar Centre of Excellence Annual Cardiovascular Scientific Day, University of Toronto, April 20-21, Toronto, ON
- 2011 Contribution of fatty acid oxidation to lipotoxicity in the heart. Lipid Biology and Lipotoxicity, Keystone Symposium, May 16-28, Killarney, Ireland.
- 2011 Developing novel heart failure therapeutics. 32 International Heart Society Research – North American Section Symposia, May 22-25, Philadelphia, USA
- 2011 Diet and Heart Disease. Scientific Sessions, BCVS – American Heart Association, July 18-21, New Orleans, USA
- 2011 Early changes in cardiac mitochondrial capacity during the development of diastolic heart failure. International Academy of Cardiology, 16th World Congress on Heart Disease, Annual Scientific Sessions, July 23-26, Vancouver, BC
- 2011 Energy metabolism in heart failure. Ottawa Heart Institute, Sept 6-7, Ottawa, ON
- 2011 Decreased fatty acid oxidation on malonyl CoA decarboxylase deficient mice does

- not exacerbate age-induced insulin resistance. Winnipeg Heart International Conference, October 13-16, Winnipeg, MB
- 2011 Promoting collaborations and translational research in a heart institute. Metabolic Diseases Workshop, University of Manitoba, November 17-18, Winnipeg, MB.
- 2011 Targeting malonyl CoA decarboxylase to treat heart disease, obesity and diabetes. UBC Pharmaceutical Sciences and The Centre for Drug Research and Development joint seminar series. University of British Columbia, November 21, Vancouver, BC
- 2011 Optimizing energy metabolism as an approach to treat heart failure. Texas Heart Institute, December 15-16, Houston, Tx
- 2012 Role of fatty acid oxidation in cardiac dysfunction in obesity and diabetes. January 19, Salt Lake City, UT
- 2012 Role of fatty acid oxidation in cardiac dysfunction in obesity and diabetes. University of Washington, February 15, Seattle, WA
- 2012 Hearts for Hope Fundraising dinner and silent auction. The Heart and Stroke Foundation Students Association. March 15, Edmonton, AB
- 2012 Metabolic therapy for the treatment of heart failure: From mice to men. April 12, Alberta Heart Training Program Seminar Series, University of Alberta, Edmonton, AB
- 2012 Cardiac hypertrophy delays the maturation of fatty acid oxidation in the newborn heart. April 25, Ascona, Italy
- 2012 Metabolic modulators as a therapy for heart failure, ISHR Conference, May 24, Banff, Alberta
- 2012 The contribution of altered fatty acid oxidation to heart failure development in the newborn heart, June 25, Oxford, England
- 2012 The contribution of altered energy metabolism to heart disease, AIHS Workshop, July 10, Edmonton
- 2012 Role of fatty acid oxidation in cardiac disease. September 7, Frontiers in Lipid Biology, Banff, Alberta
- 2012 Role of altered fatty acid oxidation in contributing to lipotoxicity in obesity. October 11, Sanford/Burnham, Orlando
- 2012 Treatment of heart failure by optimizing energy metabolism. October 25, Northwestern University, Chicago
- 2012 Role of altered fatty acid oxidation in contributing to lipotoxicity in obesity. October 26, Washington University of St. Louis, St. Louis Missouri
- 2012 Treating heart failure by optimizing energy metabolism. Cardiovascular Research Centre Seminar Series, November 1, University of Alberta.
- 2012 Obesity and heart failure. American Heart Association Scientific Sessions, November 6, Los Angeles, California
- 2012 Stimulating glucose oxidation as an approach to treat heart failure. Amgen talk, November 12, San Francisco CA.
- 2012 Targeting malonyl CoA decarboxylase to treat heart disease. November 13, Lycera talk, Ann Arbor. MI
- 2012 Coping with stress. December 6, Global TV Edmonton Interview
- 2013 Modulation of Malonyl-CoA and Cardiac Metabolic Consequences. Keystone Conference, Mitochondrial, Metabolism and Myocardial Function-Basic Advances to Translational Studies. February 3, 2013. Keystone CO.
- 2013 Development of Cardiac Insulin Resistance in the Metabolic Syndrome, Japanese Circulation Society. March 16, 2013. Yokoyama, Japan.
- 2013 Angiotensin II Inhibition of Cardiac Carbohydrate Metabolism Contributes to the Cardiorenal Syndrome, Japanese Circulation Society. March 17, 2013. Yokoyama, Japan.
- 2013 Promoting Glucose Oxidation to Treat Heart Disease and Cancer, Hatter Institute Symposia. May 3, Cape Town South Africa.
- 2013 Introduction to Cardiac Metabolism for the Pulmonologist. American Thoracic Society

- International Conference. May 19, 2013, Philadelphia, PA.
- 2013 Targeting Fatty Acid and Carbohydrate Oxidation in the Ischemic and Failing Heart. ISHR XXI World Congress. July 2, 2013, San Diego CA.
- 2013 Enhancing Glucose Oxidation as an Approach to Treat Heart Failure. International Academy of Cardiology World Congress. July 29, 2013. Vancouver BC.
- 2013 A Review of Cardiac Energy Metabolism: Warburg, Randle and Krebs for the Non-Biochemist. Grover Conference. September 8, 2013, Sedalia CO.
- 2013 Myocardial Cytoprotection. September 27, 2013. Pecs, Hungary.
- 2014 The Contribution of Diabetes and Obesity to Heart Failure. Alterations in sirtuin 3 control of fatty acid oxidation in the myocardium of obese mice. VIIth International Conference on Recent Advances in Cardiovascular Sciences (RACS). January 31, 2014. Delhi Institute of Pharmaceutical Sciences and Research, Delhi, India.
- 2014 Stimulating cardiac glucose oxidation as an approach to treat heart failure. February 2, 2014. India Science Congress, Jammu India.
- 2014 Treating heart failure by optimizing cardiac energy metabolism. Cardiovascular Research Symposium. February 9, 2014. College of Pharmacy, Qatar University.
- 2014 Malonyl CoA and acetyl CoA control of energy metabolism in ischaemic heart disease and heart failure. Biochemical Society Focused Meeting: Coenzyme A and its derivatives in Cellular Metabolism and Disease. March 28, 2014. Charles Darwin House, London UK.
- 2014 International Society for Heart Research 2014. Inhibiting fatty acid oxidation as a novel approach to treating heart failure. May 11, 2014. Miami, FA USA.
- 2014 CIHR Young Investigators Forum. The Entrepreneurial Scientist: Innovation, Intellectual Property and Commercialization. May 28, 2014. Edmonton AB
- 2014 Servier Symposia. Stable angina: the new energy target. June 19, 2014. Mexico City, Mexico.
- 2014 Stimulating cardiac glucose oxidation as an approach to treat heart failure in obesity. 2nd Cardiovascular Forum for Promoting Centres of Excellence and Young Investigators. September 4-6, 2014. Winnipeg, Manitoba.
- 2014 Stimulating glucose oxidation prevents adverse remodeling in the failing heart. September 18, 2014. Novartis, Cambridge MA.
- 2014 Optimizing energy metabolism as an approach to treat ischemic heart disease and heart failure. Agents of Change Research Symposium. September 26, 2014. Vancouver BC
- 2014 Stimulation of glucose oxidation as an approach to treat heart failure. European Section of the International Academy of Cardiovascular Sciences. October 8-11, 2014. Balatongyörök, Hungary.
- 2015 Protein acetylation and fatty acid oxidation. 35th International Society for Heart Research, North American Section, Seattle WA, June 7-10, 2015.
- 2015 How to get the most of your mentor, Women and Children's Health Research Institute Research Day, University of Alberta, October 2015.
- 2015 Optimizing energy metabolism as an approach to treat heart failure, Rutgers University, April
- 2015 Energy Metabolism in the Newborn: The infant is not a small adult, Discovery Research Rounds, Department of Pediatrics, University of Alberta, May
- 2015 Obesity-induced heart failure, International Academy of Cardiovascular Sciences, Omaha, Nebraska, Oct.
- 2015 Alterations in cardiac energy metabolism in heart failure associated with obesity, Korean Society of Obesity, Seoul, South Korea, November
- 2015 History of the Society for Heart and Metabolism, Tarrytown New York, Oct.
- 2015 Targeting fatty acid oxidation to treat heart failure, University of Pittsburgh, Dec 16th.
- 2016 Developmental changes in cardiac energy metabolism in the newborn. Pediatric Grand Rounds, University of Alberta, Jan 21st.
- 2016 Optimizing Energy Metabolism as an Approach to Treat Heart Failure, University of Calgary, Jan 28th.

- 2016 Cardiac Metabolic Complications Associated with Diabetes, 2016 National Diabetes Forum, Mont-Tremblant, Quebec, Mar 9th.
- 2016 Targeting cardiac energy metabolism as a therapy to treat heart failure, 2016 ISHR World Congress, Buenos Aires, Argentina, April 21st.
- 2016 Cardiac energy metabolism and myocardial dysfunction: Potential new avenues for treatment of heart failure. City-wide Heart Failure Dinner Lecture Series, June 20th
- 2016 Glycemia Control and Heart Failure Risk: Are Alterations in Cardiac Energy Metabolism Involved? Jansen Diabetes Rounds, Edmonton, July 12th.
- 2016 Acetyl CoA and CoA regulation of cardiac energy metabolism in health and disease via post-translational modifications of mitochondrial acetylation. Coenzyme A FEBS Workshop, Marseille France, August 23rd.
- 2016 Insulin glarine effects on cardiac energy metabolism. ESC Congress, Rome, Aug. 30th.
- 2016 Role of altered cardiac branched chain amino acid catabolism in heart failure development. Am J Physiol Symposia. Omaha, Nebraska, Sept. 8th
- 2016 Tips on how to write a research grant. University of Hong Kong, Hong Kong, Sept. 4th.
- 2016 Targeting energy metabolism to treat heart failure. University of Hong Kong, Hong Kong, Sept. 5th
- 2016 Glycemia Control and Heart Failure Risk: Are Alterations in Cardiac Energy Metabolism Involved? Jansen Diabetes Rounds, Calgary, Sept. 13th.
- 2016 Acetylation control of cardiac fatty acid oxidation and energy metabolism in obesity and diabetes. IACS NA meeting, Sherbrooke, Quebec, Sept. 23rd.
- 2016 Targeting cardiac fatty acid oxidation to treat heart failure. IACS Scientific Sessions, Marseille, France. Oct. 2nd
- 2016 Treating heart failure by targeting cardiac energy metabolism. Duke Cardiovascular Research Group, Duke University, Raleigh NC. Nov. 9th
- 2016 Amino acid metabolism in heart failure. American Heart Association, New Orleans, LA. Nov. 14th
- 2016 Targeting myocardial energy substrate metabolism American Heart Association, New Orleans LA. Nov. 15th
- 2016 Optimizing cardiac energy metabolism as an approach to treat heart failure. Dean's Research Rounds, Faculty of Pharmacy and Pharmaceutical Sciences, Edmonton, Alberta, Dec. 8th.

Research Interests:

My research focuses on the control of fatty acid oxidation in the heart. This includes the molecular mechanisms responsible for the rapid maturation of fatty acid oxidation in the heart following birth and the high rates of fatty acid oxidation in the myocardium of the diabetic, as well as how excess use of fatty acids by the heart contributes to ischemic heart disease. My research advances in this area in the last 5 years include:

1) *Malonyl CoA control of fatty acid oxidation:* A key component of my research focuses on characterizing the molecular mechanisms involved in the control of cardiac malonyl CoA, a major regulator of fatty acid oxidation in heart due to its inhibition of mitochondrial fatty acid uptake. We showed that malonyl CoA production by acetyl CoA carboxylase (ACC) is a key regulatory step in the oxidation of cardiac fatty acids, and that the heart contains an AMP-activated protein kinase (AMPK) that phosphorylates and inhibits ACC activity. AMPK acts as fuel gauge, and is activated during times of stress to increase fatty acid oxidation. We characterized two other proteins in the heart central to malonyl CoA control: 1) malonyl CoA decarboxylase (MCD), which degrades malonyl CoA and 2) AMPK kinase (AMPKK), which phosphorylates and activates AMPK. We produced a MCD adenovirus to increase MCD expression/activity in cardiac cells, and a MCD knock-out mouse, which we have used to confirm the key role of malonyl CoA as regulator of cardiac fatty acid oxidation.

2) *Cardiac fatty acid oxidation rates during and following ischemia:* High rates of fatty acid oxidation occur during and following cardiac ischemia (acute myocardial infarction, cardiac surgery, or angina pectoris), and contribute to ischemic injury. We have made important contributions to determining how alterations in fatty acid oxidation contribute to ischemic injury. We showed that a decrease in malonyl CoA levels during and following ischemia is an important mechanism contributing to the high rates of fatty acid oxidation. We also showed that this is due to an increase in AMPKK and AMPK, a decrease in ACC, and a high MCD activity.

Our research has also determined why high rate of fatty acid oxidation decrease cardiac function and efficiency during and following ischemia. We showed that high fatty acid oxidation rates decrease cardiac function and efficiency following ischemia, due to an inhibition of glucose oxidation. This uncouples glycolysis from glucose oxidation, resulting in proton production in the critical period of reperfusion, which delays recovery of pH following ischemia. We develop methodology that has allowed us to directly measure pH in fatty acid perfused working rat hearts (using ³¹P-NMR techniques), while simultaneously measuring glycolysis and glucose oxidation. We have demonstrated that uncoupled glucose metabolism is an important source of acidosis in the ischemic heart, which markedly decreases cardiac efficiency.

3) *Optimizing energy metabolism is a novel approach to treating ischemic heart disease:* An exciting development in the last 5 years is the recognition that inhibition of fatty acid oxidation is a novel clinical approach to treating ischemic heart disease and heart failure. We have shown that a number of different approaches to inhibiting fatty acid oxidation and stimulating glucose oxidation will improve cardiac function and efficiency in the ischemic heart. We demonstrated that two existing anti-anginal drugs, trimetazidine and ranolazine, act by inhibiting fatty acid oxidation, at the level of long chain 3-ketoacyl CoA thiolase, the last enzyme involved in mitochondrial β -oxidation of fatty acids. In collaboration with Chugai Pharma USA we developed inhibitors of MCD, that increase myocardial malonyl CoA levels, decreases fatty acid oxidation during and following ischemia, and improved cardiac function and efficiency during and following ischemia. This novel approach to treating myocardial ischemia will soon be undergoing clinical testing in patients with angina pectoris.

4) *Maturation of fatty acid oxidation in the newborn heart:* We previously showed that within days of birth myocardial fatty acid oxidation rate increases dramatically and becomes the major source of myocardial ATP production. We found that a decrease in ACC activity and malonyl CoA levels secondary of phosphorylation of ACC by AMPK is an important step in this increase in fatty acid oxidation. We have also shown that alterations in plasma insulin and adiponectin contribute to this maturation of fatty acid oxidation by altering AMPKK and AMPK activity. Recently, using heart biopsies obtained from newborns undergoing heart surgery, we also showed that the maturation of fatty acid oxidation in humans appears to be similar to the pathway(s) we

characterized in the newborn rabbit heart.

5) *Fatty acid oxidation in the myocardium of the diabetic:* A prominent change that occurs in the hearts of diabetics is a marked reduction in glucose use, with fatty acid oxidation accounting for almost all of the myocardial oxygen consumption. A decrease in ACC activity and increase in MCD activity in the diabetic heart contributes to these high fatty acid oxidation rates. We demonstrated that increased in peroxisomal proliferators activated receptor α (PPAR α) has a key role mediating the high rates of fatty acid oxidation in the diabetic heart. At the level of the heart, activation of PPAR α actually increases fatty acid oxidation and can contribute to the high fatty acid oxidation rates seen in the diabetic.

PATENTS:**TITLE - Post-surgical treatment with dichloroacetate**

1. United States Patent #6,727,284, Issued April 27, 2004
Inventors: Gary Lopaschuk, Ruth Collins-Nakai, Koon Teo and Jason Dyck
2. Canada Patent Application #2,305,183, Issued September 23, 1998
Inventors: Gary Lopaschuk, Ruth Collins-Nakai, Koon Teo and Jason Dyck
3. Japan Patent Application #2000-514634, Filed September 30, 1998
Inventors: Gary Lopaschuk, Ruth Collins-Nakai, Koon Teo and Jason Dyck

TITLE - Methods of Cardioprotection Using Dichloroacetate in Combination with an Inotrope

4. United States Patent #6,693,133, Issued February 17, 2004
Inventors: Gary Lopaschuk and Ruth Collins-Nakai
5. Australia Patent Application #2004315552, Filed January 16, 2004
Inventors: Gary Lopaschuk, Ruth Collins-Nakai
6. China Patent Application #200480042494.4, Filed January 16, 2004
Inventors: Gary Lopaschuk, Ruth Collins-Nakai
7. Europe Patent Application, #2006-548415, Filed Jan. 16, 2004
Inventors: Gary Lopaschuk, Ruth Collins-Nakai
8. Japan Patent Application #2006-548415, Filed January 16, 2004
Inventors: Gary Lopaschuk, Ruth Collins-Nakai
9. United States Patent #7,432,247, Issued October 7, 2008
Inventors: Gary Lopaschuk, Ruth Collins-Nakai
10. Canada Patent Application #2489853, Filed January 16, 2004
Inventors: Gary Lopaschuk, Ruth Collins-Nakai

TITLE - Dichloroacetate in combination with cardioprotective or hemodynamic drugs

11. United States Patent Application #11/339988, Filed June 7, 2006, Inventor: Gary Lopaschuk
12. Australia Patent Application #2003278896, Filed June 20, 2003, Inventor: Gary Lopaschuk
13. Canada Patent Application #2490636, Filed June 20, 2003, Inventor: Gary Lopaschuk
14. Japan Patent Application #2004-514473, Filed June 20, 2003, Inventor: Gary Lopaschuk
15. Europe Patent # 1517705, Issued May 21, 2008, Inventor: Gary Lopaschuk
16. Germany Patent # 1517705DE, Issued May 21, 2008, Inventor: Gary Lopaschuk
17. Spain Patent # 1517705ES, Issued May 21, 2008, Inventor: Gary Lopaschuk
18. France Patent # 1517705FR, Issued May 21, 2008, Inventor: Gary Lopaschuk
19. Ireland Patent # 1517705IE, Issued May 21, 2008, Inventor: Gary Lopaschuk
20. Italy Patent # 1517705IT, Issued May 21, 2008, Inventor: Gary Lopaschuk
21. United Kingdom Patent # 1517705UK, Issued May 21, 2008, Inventor: Gary Lopaschuk
22. PCT/CA03/00929 Patent Application, Filed June 20, 2003, Inventor: Gary Lopaschuk

TITLE – Compounds that stimulate glucose utilization and methods of use

23. United States Patent #7,084,173, Issued August 1, 2006
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
24. United States Patent #7,074,828 B2, Issued August 1, 2006
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
25. United States Patent #7,074,828 B1, Issued July 11, 2006
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
26. United States Patent Application #11/064,713, Issued April 28, 2009
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
27. PCT/1B06/001587 Based on US 11/064,713, Filed February 23, 2006
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck

28. United States Patent Application #11/369,182, Issued January 6, 2009
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
29. Canada Patent Application #2,480,557, Filed March 31, 2003
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
30. Japan Patent Application #2003-580,269, Filed March 31, 2003
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
31. Europe Patent Application #03,745,384.2, Filed March 31, 2003
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
32. Europe Patent Application #06765523.3, Filed February 23, 2006
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
33. Hong Kong Patent Application #08105963.4, Filed May 28, 2008
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
34. Korean Patent Application #10-2007-702151, Filed February 23, 2006
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
35. United States Patent Application #12/403,143, Filed March 12, 2009
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
36. Australia Patent Application #2006242936, Filed February 23, 2006
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
37. Canada Patent Application #200680008419.5 Filed September 14, 2007
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck
38. United States Patent Application #60/368,536, Filed April 1, 2006
Inventors: Gary Lopaschuk, John Vederas, Jason Dyck

TITLE – Methods for the treatment of diseases using malonyl-CoA decarboxylase inhibitors

39. European Patent Convention Patent #1353662, Issued April 18, 2007
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
40. Germany Patent #1353663/DE60219595.0, Issued April 18, 2007
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
41. Spain Patent #1353663, Issued April 18, 2007
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
42. France Patent #1353663, Issued April 18, 2007
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
43. Great Britain Patent #1353663, Issued April 18, 2007
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
44. Italy Patent #1353663, Issued April 18, 2007
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
45. Japan Patent #4503232, Issued January 30, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
46. United States Patent #7,385,063, Issued June 10, 2008.
Inventors: Thomas Arrhenius et al. including Gary Lopaschuk
47. United States Application #10/468,378, Filed June 10, 2008.
Inventors: Thomas Arrhenius et al. including Gary Lopaschuk

TITLE – Malonyl-CoA decarboxylase inhibitors useful as metabolic modulators

48. European Patent Convention Patent #1377290, Issued October 4, 2006. .
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
49. Spain Patent #1377290, Issued January 22, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
50. Japan Application #2009-261692, Filed January 22, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
51. United States Application # 7,279,477, Issued October 9, 2007.
Inventors: Thomas Arrhenius et al. including Gary Lopaschuk

52. Australia Patent #2002245924, Issued January 6, 2006.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
53. Canada Application #2435067, Filed January 22, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
54. Canada Application #2735478, Filed January 22, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
55. Canada Application #2735267, Filed January 22, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
56. China Patent #ZL02803537.2.2, Issued August 19, 2009.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
57. China Patent #ZL02803537.2.2, Issued August 19, 2009.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
58. China Application #200910139558.7, Filed January 22, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
59. European Patent Convention Application #1411929, Issued May 5, 2011.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
60. Spain Patent #1411929, Issued May 5, 2011.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
61. France Patent #411929, Issued May 5, 2011.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
62. Italy Patent #1411929, Issued May 5, 2011.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
63. Hong Kong Patent #1068285B, Issued January 14, 2011.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
64. Hong Kong Patent #10105316.4, Issued January 26, 2005.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
65. United Kingdom Patent #1411929, Issued May 5, 2011.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
66. Germany Patent #1411929, Issued May 5, 2011.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
67. United States Patent #7,524,969, Issued April 28, 2009.
Inventors: Thomas Arrhenius et al. including Gary Lopaschuk
68. United States Application #12/431,720, Filed July 21, 2003.
Inventors: Thomas Arrhenius et al. including Gary Lopaschuk
69. South Korea Patent #637564, Issued October 16, 2006.
Inventors: Thomas Arrhenius et al. including Gary Lopaschuk
70. Great Britain Patent #1377290. Issued January 22, 2002. .
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
71. France Patent #1377290. Issued January 22, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
72. Italy Patent #1377290. Issued January 22, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
73. Germany Patent #1377290/DE60215139.2, Issued January 22, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk

TITLE – Azoles as malonyl-CoA decarboxylase inhibitors useful as metabolic modulators

74. Australia Patent #2002251987, Issued June 2, 2005
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
75. Brazil Application #PI0207408-7, Filed February 19, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
76. Canada Patent #2,437,409, Issued October 19, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk

77. China Patent #ZL02805216.1, Issued April 23, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
78. European Patent Convention Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
79. Albania Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
80. Austria Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
81. Belgium Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
82. Switzerland Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
83. Cyprus Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
84. Germany Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
85. Denmark Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
86. Spain Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
87. Finland Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
88. France Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
89. United Kingdom Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
90. Greece Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
91. Ireland Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
92. Italy Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
93. Liechtenstein Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
94. Luxembourg Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
95. Monaco Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
96. Netherlands Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
97. Portugal Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
98. Sweden Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
99. Turkey Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
100. Lithuania Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
101. Latvia Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
102. Macedonia Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk

103. Romania Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
104. Slovenia Patent #1370260, Issued November 24, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
105. Hong Kong Patent #1062633, Issued January 28, 2011.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
106. Hungary Application #P0303272, Filed February 19, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
107. Israel Application #156827, Filed February 19, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
108. Japan Patent #4,155,351, Issued July 18, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
109. South Korea Patent #659427, Issued December 12, 2006.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
110. Mexico Application #PA/A/2003/007441, Filed February 19, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
111. Norway Application #2003 3665, Filed February 19, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
112. New Zealand Patent #526883, Issued March 9, 2006..
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
113. Poland Application #204456, Issued February 19, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
114. Russian Federation Application #2003 128307, Filed February 19, 2002. Issued.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
115. United States Patent #7,709,510, Issued May 4, 2010.
Inventors: Thomas Arrhenius et al. including Gary Lopaschuk
116. United States Application #12/772,552, Filed May 3, 2010.
Inventors: Thomas Arrhenius et al. including Gary Lopaschuk

TITLE – Heterocyclic compounds useful as malonyl-CoA decarboxylase inhibitors

117. United States Patent #7,696,365, , Issued April 13, 2010.
Inventors: Jei-Fei Cheng et al. including Gary Lopaschuk
118. Canada Application #2533747, Filed July 28, 2004.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
119. Europe Patent #1653944, Issued November 11, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
120. Germany Patent #1653944, Issued November 11, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
121. France Patent #1653944, Issued November 11, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
122. United Kingdom Patent #1653944, Issued November 11, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
123. Spain Patent #1653944, Issued November 11, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
124. Italy Patent #1653944, Issued November 11, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
125. Japan Patent #4727578, Issued April 22, 2011.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk

TITLE – Piperidine compounds useful as malonyl-CoA decaroxylase inhibitors

126. United States Patent #7,449,482, Issued November 11, 2008.
Inventors: Seraguniv et al. including Gary Lopaschuk

127. United States Application #12/245,558, Filed October 3, 2008.
Inventors: Seraguniv et al. including Gary Lopaschuk
128. Canada Application #2533749, Filed July 28, 2004.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
129. Europe Patent #1653957, Issued July 9, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
130. Germany Patent #1653957, Issued July 9, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
131. Spain Patent #1653957, Issued July 9, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
132. France Patent #1653957, Issued July 9, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
133. Great Britain Patent #1653957, Issued July 9, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
134. Italy Patent #1653957, Issued July 9, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
135. Japan Patent #4648317, Issued December 17, 2010.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk

TITLE – Cyanoguanidine-based azole compounds useful as malonyl-CoA decarboxylase inhibitors

136. United States Patent #7,786,145. Issued August 31, 2010.
Inventors: Jie-Fei Cheng et al. including Gary Lopaschuk
137. Canada Application #2533881, Filed July 28, 2004.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
138. Europe Patent #1658071, Issued September 10, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
139. Germany Patent #1658071, Issued September 10, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
140. Spain Patent #1658071, Issued September 10, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
141. France Patent #1658071, Issued September 10, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
142. Great Britain Patent #1658071, Issued September 10, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
143. Italy Patent #1658071, Issued July 28, 2007.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
144. Europe Application #08163168.1, Filed September 10, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
145. Japan Application #2006-522615, Filed July 28, 2004.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk

TITLE – Cyanoamide compounds useful as malonyl-CoA decarboxylase inhibitors

146. United States Patent #7,285,562, Filed October 23, 2007.
Inventors: Mark D. Kafka et al. including Gary Lopaschuk
147. Canada Application #2533763, Filed July 28, 2004.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
148. United States Patent #7,897,615, Filed March 1, 2011.
Inventors: Mark D. Kafka et al. including Gary Lopaschuk
149. Europe Patent #1648564, Issued October 17, 2007
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
150. Germany Patent #1648564, Issued October 17, 2007

- Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
151. Spain Patent #1648564, Issued October 17, 2007
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
152. France Patent #1648564, Issued October 17, 2007
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
153. United Kingdom Patent #1648564, Issued October 17, 2007
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
154. Italy Patent #1648564, Issued October 17, 2007
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
155. Japan Patent #2006-522611, Filed April 22, 2011.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk

TITLE – Methods for measuring the metabolism of and screening for drugs in isolated hearts

156. United States Patent #6,653,090, Issued November 25, 2003
Inventor: Gary Lopaschuk

TITLE – Methods for the treatment of metabolic diseases using malonyl-CoA decarboxylase inhibitors

157. Japan Patent #4,155,361, Issued July 18, 2008.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
158. European Patent #1379243, Issued September 9, 2009.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
159. Germany Patent #1379243/ DE60233650.3, Issued September 9, 2009.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
160. United Kingdom Patent #1379243, Issued September 9, 2009.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
161. France Patent #1379243, Issued September 9, 2009.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
162. Spain Patent #1379243, Issued September 9, 2009.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
163. Italy Patent #1379243, Issued September 9, 2009.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
164. Japan Application #2007-318038, Filed February 19, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
165. Japan Application #2007-324412, Filed February 19, 2002.
Inventors: Chugai Seiyaku Kabushiki Kaisha including Gary Lopaschuk
166. United States Patent #7,723,366, Issued May 25, 2010.
Inventors: Thomas Arrhenius et al. including Gary Lopaschuk

BIBLIOGRAPHY

1. Bellward GD, Li M, Lopaschuk GD, and Warren P. The effect of alpha-1-acetylmethadol hydrochloride on rat hepatic acyl hydrocarbon hydroxylase and epoxide hydrase. *Res Commun Chem Path Pharmacol* 2005;18:415-422
2. Lopaschuk GD, Richter B, and Katz S. Characterization of calmodulin effects on calcium transport in cardiac microsomes enriched in sarcoplasmic reticulum. *Biochemistry* 1980;19:5603-5607.
3. Graf E, Verma AK, Gorski JP, Lopaschuk GD, Niggli, V Zurini, M Carafoli E, and Penniston JT. Molecular properties of the Calcium-pumping from human erythrocytes. *Biochemistry* 1980;21:4511-4516.
4. Lopaschuk GD, Katz S, and McNeill JH. The effect of alloxan and streptozotocin-induced diabetes on calcium transport in rat cardiac sarcoplasmic reticulum. The possible involvement of long chain acylcarnitines. *Can J Physiol Pharmacol* 1983;61:439-448
5. Lopaschuk GD, Tahiliani A, and McNeill JH. Continuous long term insulin delivery in diabetic rats utilizing implanted osmotic minipumps. *J Pharmacol Methods* 1983;9:71-75
6. Rodgers RL, Lopaschuk GD, and McNeill JH. Effect of reserpine pretreatment on calcium and Ca⁺⁺-Mg⁺⁺ adenosine triphosphatase activity of guinea-pig cardiac microsomes. *J Pharmacol Exper Ther* 1983;226:206-210.
7. Lopaschuk GD, Eibschutz B, Katz S, and McNeill JH. Depression of calcium transport in sarcoplasmic reticulum from diabetic rats: Lack of involvement by specific regulatory mediators. *Gen Pharmacol* 1984;15:1-5.
8. Lopaschuk GD, Tahiliani AG, Vadlamudi RVSV, Katz S, and McNeill JH. Cardiac sarcoplasmic reticulum function on insulin- or carnitine-treated diabetic rats. *Am J Physiol* 1983;245:H969-H976 .
9. Lopaschuk GD, Katz S, and McNeill JH. Characterization of cardiac microsomal sarcoplasmic reticulum prepared from control and diabetic rats. *J Pharmacol Methods* 1983;10:199-206.
10. Eibschutz B, Wong APG, Lopaschuk GD, and Katz S. The presence and binding characterization of calmodulin in microsomal preparations enriched in sarcoplasmic reticulum from skeletal muscle. *Cell Calcium* 1984;5:391-400.
11. Eibschutz B, Lopaschuk GD, Katz S, and McNeill JH. Ca²⁺-transport in skeletal muscle sarcoplasmic reticulum of chronically diabetic rats. *Res Commun Chem Pathol Pharmacol* 1984;45:301-304.
12. Tahiliani AG, Lopaschuk GD, and McNeill JH. Effect of insulin treatment on long term diabetes-induced alterations of myocardial function. *Gen Pharmacol* 1984;15:545-548.
13. Godin DV, Lopaschuk GD, and McNeill JH. Subcellular myocardial abnormalities in experimental diabetes: Role of long chain acylcarnitines. *Can J Cardiol* 1986;2:222-229.
14. Lopaschuk GD, Hansen CA, and Neely JR. Fatty acid metabolism in hearts containing elevated levels of coenzyme A *Am J Physiol* 1986;250: H351-H359.
15. Lopaschuk GD, and Neely JR. Stimulation of myocardial coenzyme A degradation by fatty acids. *Am. J.*

Physiol. 1987;253:H41-H46.

16. Lopaschuk GD, and Neely JR. Coenzyme A degradation in the heart: effect of diabetes and insulin. *J. Mol Cell Cardiol* 1987;19:281-287.
17. Lopaschuk GD, Michalak M, and Tsang H. Regulation of pantothenic acid transport in the heart. Involvement of a Na⁺-cotransport system. *J Biol Chem* 1987;262:3615-3619.
18. Lopaschuk GD, and Tsang H. Metabolism of palmitate in isolated working hearts from spontaneously diabetic "BB" Wistar rats. *Circ. Res.* 1987;61:853-858 .
19. Lopaschuk GD. Insulin effects on pantothenic acid uptake in isolated perfused working hearts from diabetic rats. *Diabetes* 1988;37:1335-1338.
20. Lopaschuk GD, Wall SR, Olley PM, and Davies NJ. Etomoxir, a carnitine palmitoyltransferase I inhibitor, protects hearts from fatty acid induced ischemic injury independent of changes in long chain acylcarnitine. *Circ Res* 1988;63:1036-1043.
21. Lopaschuk GD, and Spafford M. Response of isolated working hearts to fatty acids and carnitine palmitoyltransferase I inhibition during reduction of coronary flow in acutely and chronically diabetic rats. *Circ Res* 1989;65:378-387.
22. Lopaschuk GD, Michalak M, Wandler EL, Lerner RW, Piscione TD, Coceani F. and Olley, P.M. Prostaglandin E. receptor in cardiac sarcolemma. Identification and coupling to adenylate cyclase. *Circ Res* 1989;65:538-545.
23. Wall SR, and Lopaschuk GD. Glucose oxidation rates in fatty acid perfused isolated working hearts from diabetic rats. *Biochim Biophys Acta* 1989;1006:97-103.
24. Lopaschuk GD, McNeil J. and McVeigh J. Glucose oxidation is stimulated in reperfused hearts with the carnitine palmitoyltransferase 1 inhibitor, Etomoxir. *Mol. Cell Biochem* 1989;88:175-179.
25. Lopaschuk GD. Alterations in myocardial fatty acid metabolism contribute to ischemic injury in the diabetic. *Can J Cardiol* 1989;5:315-320.
26. Lopaschuk GD, Spafford, M Davies NJ, and Wall SR. Glucose and palmitate oxidation in isolated working rat hearts reperfused following a period of transient global ischemia. *Circ Res* 1990;66:546-553.
27. Lopaschuk GD. Acute insulin withdrawal contributes to ischemic heart failure in spontaneously diabetic BB Wistar rats. *Can J Physiol Pharmacol* 1990;68:462-466.
28. Lopaschuk GD. and Spafford M. Energy substrate utilization by isolated working hearts of newborn rabbits. *Am J Physiol* 1990;258:H1274-H1280.
29. Montague TJ, Lopaschuk GD, and Davies NJ. Viral heart disease. *Chest* 1990;98:190-199 .
30. McVeigh J, and Lopaschuk GD. Dichloroacetate stimulation of glucose oxidation improves mechanical recovery of ischemic rat hearts. *Am J Physiol* 1990;259:H1079-H1085.
31. Michalak M, Wandler EL, Strynadka K, Lopaschuk GD, Njue WM, Liu HJ and Olley. P.M. Prostaglandin Receptor in the Heart. I. Identification and Photolabelling of the PGE₂ receptor. *FEBS Letters* 1990;265:117-120.

32. Lerner RW, Lopaschuk GD, and Olley PM. High affinity Prostaglandin E receptors in attenuate adenylyl cyclase activity in isolated bovine myometrial membrane. *Can J Physiol Pharmacol* 1990;68:1574-1580.
33. Wong R, Davies N, Marshall D, Allen P, Zhu G, Lopaschuk G, and Montague T. Metabolism of normal skeletal muscle during dynamic exercise to clinical fatigue in vivo assessment by nuclear magnetic resonance spectroscopy. *Can J Cardiol* 1990;6:391-395.
34. Davies NJ, McVeigh JJ, and Lopaschuk GD. Effect of TA-3090, a new calcium channel blocker, on myocardial substrate utilization in ischemic and non-ischemic isolated working fatty acid perfused rat hearts. *Circ Res* 1991;68:807-817.
35. Lopaschuk GD, and Russell JR. Myocardial function and energy substrate metabolism in the insulin-resistant JCR:LA-corpulent rat. *J Appl Physiol* 1991;71:1302-1308 .
36. Saddik M, and Lopaschuk GD. Myocardial triglyceride turnover and contribution to energy substrate utilization in isolated working rat hearts. *J Biol Chem* 1991;266:8162-8170 .
37. Nicholl TA, and Lopaschuk GD, and McNeill JH. Effects of free fatty acids and dichloroacetate on the isolated working diabetic rat heart. *Am J Physiol* 1991;261:H1053-H1059.
38. Saddik M, and Lopaschuk GD. The fate of arachidonic acid and linoleic acid in isolated working rat hearts containing normal or elevated levels of coenzyme A. *Biochim Biophys Acta* 1991;1086:217-224.
39. Lopaschuk GD, Spafford MA, and Marsh DR. Glycolysis is predominant source of myocardial ATP production immediately after birth. *Am. J. Physiol* 1991;261:H1698-H1705.
40. Broderick TL, Barr RL, Quinney A, and Lopaschuk GD. Acute insulin withdrawal from diabetic "BB" rats decreases myocardial glycolysis during low flow ischemia. *Metabolism* 1992;41:332-338.
41. Lerner R, Lopaschuk GD, and Olley PM. Prostaglandin E2 receptors in the heart are coupled to inhibition of adenylyl cyclase via a pertussis toxin-sensitive G protein. *Can J Physiol Pharmacol* 1992;70:77-84.
42. Broderick T, Quinney A, and Lopaschuk GD. Carnitine stimulated glucose oxidation in isolated working hearts perfused with high concentrations of fatty acids. *J Biol Chem* 1992;267:3758-3763 .
43. Finegan BA, Clanachan, AS, Coulson CS, and Lopaschuk GD. Adenosine modification of energy substrate in use is isolated heart perfused with fatty acids. *Am J Physiol* 1992;262:H1501-H1506.
44. Saddik M and Lopaschuk GD. Myocardial triglycerides turnover during reperfusion of isolated rat hearts subjected to a transient period of global ischemia. *J Biol Chem* 1992;267:3825-3831.
45. Lerner RW, Lopaschuk GD, Catena RC, and Olley PM. Prostacyclin and prostaglandin E2 compete for the same receptor site on cardiac sarcolemmal membranes. *Biochim Biophys Acta* 1992;1105:189-192.
46. Davies NJ, Lovlin R, and Lopaschuk GD. Effects of exogenous fatty acids on reperfusion arrhythmias in isolated working perfused hearts. *Am J Physiol* 1992;262:H1796-H1801 .
47. Lopaschuk GD, Barr R, and Wambolt R. Effects of diltiazem on glycolysis and oxidative metabolism in the ischemic and ischemic/reperfused heart. *J Pharmacol Exp Therap* 1992;260:1220-1228.
48. Davies NJ, Schulz R, Olley PM, Strynadka K, Panas DL, and Lopaschuk GD. Lysoplasmeyl-

- ethanolamine accumulation in ischemic reperfused isolated fatty acid perfused hearts. *Circ Res* 1992;70:1161-1168.
49. Lopaschuk GD, Saddik M, Barr R, Huang L, Barker CC, and Muzyka RA. Effects of high levels of fatty acids on functional recovery of ischemic hearts from diabetic rats. *Am J Physiol* 263: 1992;E1046-E1053.
 50. Lopaschuk GD, and Spafford MA. Differences in myocardial ischemic tolerance between one and seven day old rabbits. *Can J Physiol Pharmacol* 1992;70:1315-1323.
 51. Dyck JRB, Lopaschuk GD, and Fliegel L, Identification of a small Na⁺-H⁺ exchanger-like message in the rabbit myocardium. *FEBS Letters* 1992;310:255-259.
 52. Lakey JRT, Thomson ABR, Keelan M, Lopaschuk GD, Clandinin MT, Cheeseman CI and Rajotte RV. Dietary lipid content influences the clinical and intestinal adaptive responses to islet transplantation in diabetic rats. *Diabetes Res.* 1992;19:149-164
 53. Wong R, Lopaschuk GD, Zhu G, Walker D, Catellier D, Burton D, Teo K, Collins-Nakai R, and Montague, T. Skeletal muscle metabolism in the chronic fatigue syndrome in vivo assessment by 31P nuclear magnetic resonance spectroscopy. *Chest* 1992;102:1716-1722.
 54. Wong R, Lopaschuk GD, Teo T, Walker D, Catellier D, Zhu G, Burton D, Collins-Nakai R and Montague T. In vivo skeletal muscle metabolism during dynamic exercise and recovery: Assessment by nuclear magnetic resonance spectroscopy. *Can J Cardiol* 1992;8:819-824 .
 55. Finegan BA, Lopaschuk GD, Coulson CS and Clanachan AS. Adenosine alters glucose use during ischemia and reperfusion in isolated rat hearts. *Circulation* 1993;87:900-908 .
 56. Lopaschuk GD, Wambolt RB and Barr RL. An imbalance between glycolysis and glucose oxidation is a possible explanation for the detrimental effects of high levels of fatty acids during aerobic reperfusion of ischemic hearts. *J Pharmacol Exp Therap* 1993;264:135-144.
 57. Broderick T, Quinney A, and Lopaschuk GD. Beneficial effects of carnitine on mechanical recovery of rat hearts reperfused after a transient period of global ischemia is accompanied by a stimulation of glucose oxidation. *Circulation* 1993;87:972-981.
 58. Mao GD, Thomas PD, Lopaschuk GD and Poznansky M. Superoxide dismutase (SOD)-catalase conjugates: Role of hydrogen peroxide and the Fenton reaction in SOD toxicity. *J Biol Chem* 1993;268:416-420.
 59. Schulz R, Strynadka KD, Panas DL, Olley PM, and Lopaschuk GD. Analysis of myocardial plasmalogen and diacyl-phospholipids and their arachidonic acid content using high performance liquid chromatography. *Anal Biochem* 1993;213:140-146.
 60. Itoi T, Huang L and Lopaschuk GD. Glucose use in neonatal rabbit hearts reperfused after global ischemia. *Am J Physiol* 1993;34:H427-H433.
 61. Gamble J, and Lopaschuk GD. Glycolysis and glucose oxidation during reperfusion of ischemic hearts from diabetic rat hearts. *Biochim Biophys Acta* 1993;1225:191-199.
 62. Itoi T, and Lopaschuk GD. The contribution of glycolysis, glucose oxidation, lactate oxidation and fatty acid oxidation to ATP production in isolated bi-ventricular working hearts from 2-week old rabbits. *Ped*

Res 34:1994;735-741 .

63. Lopaschuk GD, Lakey JRT, Wambolt R, Thomson ABR, Clandinin MT, and Rajotte RV. Islet transplantation improves glucose oxidation and mechanical function in diabetic rat hearts. *Can J Physiol Pharmacol* 1994;896-903.
64. Saddik M, Gamble J, Witters LA and Lopaschuk GD. Acetyl-CoA carboxylase regulation of fatty acid oxidation in the heart. *J Biol Chem* 1994;268:25836-25845.
65. Lopaschuk GD, Collins-Nakai, R Olley, PM Montague, TJ McNeil, G Gayle, M Ryan, T Penkoske, P Yeung L and Finegan BA. Plasma fatty acid levels in infants and adults after myocardial ischemia. *Am Heart J* 1994;128:61-67.
66. Liu B, Lopaschuk GD and Wang LCH. Improved rat heart function after low Ca²⁺ perfused preservation at 5°C for 18 hours. *Cryobiology* 1994;31:254-262.
67. Glatz JFC, Van Breda E, Keizer HA, De Jong YF, Lakey JRT, Rajotte RV, Thompson A, Van Der Vusse GJ and Lopaschuk GD. Rat heart fatty acid-binding protein content is increased in experimental diabetes. *Biochim Biophys Res Comm* 1994;199:639-646.
68. Collins-Nakai RL, Noseworthy D, and Lopaschuk GD. Epinephrine increases ATP production in hearts by preferentially increasing glucose metabolism. *Am J Physiol* 1994;267: H1862-H1871.
69. Saddik M, and Lopachuk GD. Triacylglycerol turnover in isolated working hearts of acutely diabetic rats. *Can J Physiol Pharmacol* 1994;72:1110-1119.
70. Allard MF, Schönekeess BO, Henning SL, English DR, and Lopaschuk GD. The contribution of oxidative metabolism and glycolysis to ATP production in hypertrophied hearts. *Am J Physiol* 1994; 267:H742-H750.
71. Lopaschuk GD, Belke DB, Gamble J, Itoi T and Schönekes BO. Regulation of fatty acid oxidation in the mammalian heart in health and disease. *Biochim Biophys Acta* 1994;1213:263-276.
72. Lopaschuk GD and Gamble J. Acetyl-CoA carboxylase: An important regulator of fatty acid oxidation in the heart. *Can J Physiol Pharmacol* 1994;72:1101-1109.
73. Montague T, De Almeida J, Lopaschuk GD, Witkowski F, Walker D, Ackman M, Davies, N Dzavik V, and Teo K. Enhanced glucose oxidation in acute low-flow myocardial ischemia: in vivo assessment by exercise body surface potential mapping. *Can J Cardiol* 1994;10:913-919.
74. Lopaschuk GD, Witters LA, Itoi T, Barr R, and Barr A. Acetyl CoA carboxylase involvement in the rapid maturation of fatty acid oxidation in the newborn rabbit heart. *J Biol Chem* 1994;269:25871-25878.
75. Schulz R, Panas DL, Catena R, Moncada S, P Olley PM and Lopaschuk GD. The role of nitric oxide in cardiac depression induced by interleukin-1b and tumour necrosis factor-a. *Br J Pharmacol*. 1995;114:27-34.
76. Broderick TL, Quinney HA, and Lopaschuk GD. L-carnitinè increases glucose metabolism and mechanical function following ischemic in diabetic rats. *Cardiovasc Res* 1995;29:373-378.
77. Schönekeess BO, Allard MF, Lopaschuk GD. Propionyl L-carnitine improvement of hypertrophied heart function is accompanied by an increase in carbohydrate oxidation. *Circ Res* 1995;77:726-734 .

78. Kudo N, Barr AJ, Barr RL, Desai S and Lopaschuk GD. High rates of fatty acid oxidation during reperfusion of ischemic hearts are associated with a decrease in malonyl CoA levels due to an increase in 5'AMP-activated protein kinase inhibition of acetyl CoA carboxylase. *J Biol Chem* 1995;270:17513-17520.
79. Schönekeess BO, Allard MF and Lopaschuk GD. Propionyl-L-carnitine improvement of hypertrophied rat heart function is associated with an increase in cardiac efficiency. *Eur J Pharmacol* 1995;286:155-166.
80. Schönekeess B, Brindley PG, Lopaschuk GD. Calcium regulation of glycolysis, glucose oxidation, and fatty acid oxidation in the aerobic and ischemic heart. *Can J Physiol Pharmacol* 1995;73:1632-1640.
81. Finegan BA, Lopaschuk GD, Gandhi M and Clanachan AS. Ischemic preconditioning inhibits glycolysis and proton production in isolated working rat hearts. *Am J Physiol* 1995;269:H1767-H1774.
82. Broderick TL, Panagakis G, Gamble J, Lopaschuk GD, Shug AL and Paulson DJ. L-carnitine improvement of cardiac function is associated with a stimulation in glucose but not fatty acid metabolism in carnitine-deficient hearts. *Cardiovasc Res* 1995;30:815-820.
83. McCormack JG, Barr RL and Lopaschuk GD. Ranolazine stimulates glucose oxidation in normoxic, ischemic and reperfused ischemic rat hearts. *Circulation* 1996;93:135-142.
84. Liu B, El-Alaoui Talibi Z, Clanachan AS, Schulz R and Lopaschuk GD. Uncoupling of contractile function from mitochondrial tricarboxylic acid cycle activity and oxygen consumption during reperfusion of ischemic rat hearts. *Am J Physiol* 1996;270:H72-H80
85. Henning S, Wambolt R, Schönekeess B, Lopaschuk G, Allard M. Contribution of glycogen to aerobic myocardial glucose utilization. *Circulation* 1996;93:1549-1555.
86. Schönekeess B, Allard MF, Lopaschuk GD. Recovery of glycolysis and oxidative metabolism during post-ischemic reperfusion of hypertrophied rat hearts. *Am J Physiol* 1996;271:H798-H805
87. Odland LM, Heigenhauser GJF, Lopaschuk GD, Spriet LL. Human skeletal muscle malonyl-CoA at rest and during prolonged submaximal exercise. *Am J Physiol* 1996;270:E541-E544.
88. Kudo N, Gillespie JG, Kung L, Witters LA, Schulz R, Clanachan AS, Lopaschuk GD. Characterization of 5'AMP-activated protein kinase activity in the heart and its role in inhibiting acetyl CoA carboxylase during reperfusion following ischemia. *Biochim Biophys Acta* 1996;130:67-75.
89. Hall JL, Stanley WC, Lopaschuk GD, Wisneski JA, Pizzuro RD, Hamilton CD, McCormack JG. Impaired pyruvate oxidation but normal glucose uptake in diabetic pig heart during dobutamine-induced work. *Am J Physiol* 1996;271: H2320-H329.
90. McCormack JG, Baracos VE, Barr R and Lopaschuk GD. Effects of ranolazine on oxidative substrate preference in epitrochlearis muscle. *J Appl Physiol* 1996;81:905-910.
91. Liu B, Clanachan AS, Schulz R, Lopaschuk GD. Cardiac efficiency is improved following ischemia by altering both the source and fate of protons. *Circ Res* 1996;79:940-948.
92. Olley PM, Kasserra J, Kozak R, Lopaschuk GD. Synergism between prostaglandin E2 and isoproterenol in stimulating glucose oxidation in the heart. *Can. J Physiol Pharmacol* 1996;74:590-597.

93. Itoi T and Lopaschuk GD. Calcium improves mechanical function and carbohydrate metabolism following ischemia in isolated bi-ventricular working hearts from immature rabbits. *J Mol Cell Cardiol* 1996;28:1501-1514.
94. Hall JL, Lopaschuk GD, Barr A, Bringas J, Pizzuro RD, Stanley WC. Increased cardiac fatty acid uptake with dobutamine infusion in swine is accompanied by a decrease in malonyl CoA levels. *Cardiovasc Res* 1996;32:879-885.
95. Finegan B, Lopaschuk GD, Ghandi M and Clanachan AS. Inhibition of glycolysis and enhanced mechanical function of working rat hearts as a result of adenosine A1 receptor stimulation during reperfusion following ischaemia. *Br J Pharmacol* 1996;118:2355-363.
96. Sidossis LR, Lopaschuk GD, Wolfe RR. Glucose plus insulin regulate fat oxidation by controlling the rate of fatty acid entry into the mitochondria. *J Clin Invest* 1996;98:224-2250.
97. Finegan B, Ghandi M, Clanachan AS and Lopaschuk GD. Antecedent ischemia reverses adenosine on glycolysis and mechanical function of working rat hearts. *Am J Physiol* 1996;271:H2116-H2125.
98. Lopaschuk GD and Stanley WC. Glucose metabolism in the ischemic heart *Circulation* 1997;95:313-315.
99. Schönekeess BO, Allard MF, Henning SL, Wambolt RB and Lopaschuk GD. Contribution of glycogen and exogenous glucose to glucose metabolism during ischemia in the hypertrophied rat heart. *Circ Res* 1997;81: 540-549.
100. Schulz R, Dodge KL, Lopaschuk GD and Clanachan AS. Peroxynitrite impairs cardiac contractile function by decreasing cardiac efficiency. *Am J Physiol* 1997;272: H1212-H1219.
101. Makinde AO, Gamble J and Lopaschuk GD. Upregulation of 5' AMP-activated protein kinase is responsible for the increase in myocardial fatty acid oxidation rates following birth in the newborn rabbit. *Circ Res* 1997;80: 482-489.
102. Belke D, Wang L and Lopaschuk GD. Effects of hypothermia on energy metabolism in rat and Richardson's ground squirrel hearts. *J Appl Physiol* 1997;82: 1210-1218.
103. Stanley WC, Lopaschuk GD, Hall JL and McCormack JG. Regulation of myocardial carbohydrate metabolism under normal and ischaemic conditions: Potential for pharmacological interventions. *Cardiovasc Res* 1997;33: 243-257.
104. Allard MF, Henning SL, Wambolt RB, Granleese SR, English DR and Lopaschuk GD. Glycogen metabolism in the aerobic hypertrophied rat heart. *Circulation* 1997;96: 676-682 .
105. Feuvray D and Lopaschuk GD. Controversies on the sensitivity of the diabetic heart to ischemic injury: the sensitivity of the diabetic heart to ischemic injury is decreased. *Cardiovasc Res* 1997;34:113-120.
106. Feuvray D, Lopaschuk GD. Diabetes mellitus and the cardiovascular system. *Cardiovasc Res* 1997;34:1-2.
107. Stanley WC, Lopaschuk GD, McCormack JG. Regulation of energy substrate metabolism in the diabetic heart. *Cardiovasc Res* 1997;34:125-133.
108. Gamble J and Lopaschuk GD. Insulin inhibition of 5'adenosine monophosphate-activated protein kinase in the heart results in activation of acetyl coenzyme A carboxylase and inhibition of fatty acid oxidation.

Metabolism 1997;46:1270-1274.

109. Lopaschuk GD. Alterations in fatty acid oxidation during reperfusion of the heart after myocardial ischemia. *Am J Cardiol* 1997;80:11A-16A.
110. Belke DD, Wang L, Lopaschuk GD. Acetyl-CoA carboxylase control of fatty acid oxidation in hearts from hibernating Richardson's ground squirrels. *Biochim Biophys Acta* 1998;1391: 25-36.
111. Dyck JRB and Lopaschuk GD. Glucose metabolism, H⁺ production and Na⁺/H⁺ exchanger mRNA levels in ischemic hearts from diabetic rats. *Mol Cell Biochem* 1998;180: 85-93.
112. Shangraw E Rabkin, Lopaschuk GD. Hepatic pyruvate dehydrogenase activity in humans: Effects of cirrhosis, transplantation and dichloroacetate. *Am J Physiol* 1998;37:G569-G577.
113. Ford W, Clanachan AS, Lopaschuk GD, Schulz R, Jugdutt BI. Intrinsic Ang II type 1 receptor stimulation contributes to recovery of post-ischemic mechanical junction. *Am J Physiol* 1998;43:H1524-H1531.
114. Ford W, Lopaschuk GD, Schulz RS, Clanachan AS. KATP-channel activation: effects on myocardial recovery to adenosine A1-receptor stimulation. *Br J Pharmacol* 1998;124:639-646.
115. Liu Q, Clanachan AS, Lopaschuk GD. Acute effects of triiodothyronine on glucose and fatty acid metabolism during reperfusion of ischemic rat hearts. *Am J Physiol* 1998;275:H392-H399.
116. Fraser H, Lopaschuk GD, Clanachan AS. Assessment of glycogen turnover in aerobic, ischemic and reperfused working rat hearts. *Am J Physiol* 1998;275:H1533-H1541.
117. Dyck JRB, Barr A, Barr R, Kolattukudy PE, Lopaschuk GD. Characterization of cardiac malonyl-CoA decarboxylase and its putative role in regulating fatty acid oxidation. *Am J Physiol* 1998;275:H2122-H2129.
118. Makinde AO, Kantor PF, Lopaschuk GD. Maturation of fatty acid and carbohydrate metabolism in the newborn heart. *Mol Cell Biochem* 1998;188:49-56.
119. Saiki Y, Lopaschuk GD, Dodge K, Yamaya K, Morgan C, Rebeyka IM. Pyruvate augments mechanical function via activation of the pyruvate dehydrogenase complex in reperfused ischemic immature rabbit hearts. *J Surg Res* 1998;79:164-169.
120. Kantor PF, Robertson MA, Coe JY, Lopaschuk GD. Volume overload hypertrophy of the newborn heart slows the maturation of enzymes involved in the regulation of fatty acid metabolism. *J Am Coll Cardiol* 1999;33:1724-1734.
121. Larsen TS, Belke DD, Dani R, Giles WR, Severson DL, Lopaschuk GD, Tyberg JV. The Isolated working mouse heart: methodological considerations. *Pflugers Archives Eur J Physiol* 1999;437:979-985.
122. Bergman BC, Butterfield GE, Wolfel EE, Casazza GA, Lopaschuk GD, Brooks, G.A. An evaluation of exercise and training on muscle lipid metabolism. *Am J Physiol* 1999;276:E106-E117.
123. Voilley N, Roduit R, Vicaretti R, Bonny C, Waeber G, Dyck JRB, Lopaschuk GD, Prentki, M. Cloning and expression of rat pancreatic β -cell malonyl-CoA decarboxylase. *Biochem J* 1999;340:213-217.

124. Bergman BC, Butterfield GE, Wolfel EE, Casazza GA, Lopaschuk GD, Brooks GA. Muscle net glucose uptake and glucose kinetics after endurance training in men. *Am J Physiol* 1999;277:E81-E92.
125. Dyck JRB, Kudo N, Barr AJ, Davies SP, Hardie G, Lopaschuk GD. Phosphorylation control of cardiac acetyl-CoA carboxylase by cAMP-dependent protein kinase and 5'-AMP activated protein kinase. *Eur J Biochem* 1999;262:184-190.
126. Belke DD, Larsen TS, Lopaschuk GD and Severson DL. Glucose and fatty acid metabolism in the isolated working mouse heart. *Am J Physiol* 1999;277:R1210-R1217.
127. Fraser H, Lopaschuk GD, Clanachan AS. Alterations and glucose metabolism in ischaemic and post-ischaemic working rat hearts by adenosine A1 receptor stimulation. *Br J Pharmacol* 1999;128:197-205.
128. Kline JA, Thornton LR, Lopaschuk GD, Barbee RW and Watts JA. Heart function after severe hemorrhagic shock. *Shock* 1999;12:411-490.
129. Bergman BC, Wolfel EE, Butterfield GE, Lopaschuk GD, Casazza GA, Horning MA, Brooks GA. Active muscle and whole body lactate kinetics after endurance training in men. *J Appl Physiol* 1999;87:1684-1696.
130. Wambolt RB, Henning SL, English DR, Dyachkova Y, Lopaschuk GD, Allard, M.F. Glucose utilization and glycogen turnover are accelerated in hypertrophied rat hearts during severe low-flow ischemia. *J Mol Cell Cardiol* 1999;31:493-502.
131. Sakamoto J, Barr RL, Kavanagh KM, Lopaschuk GD. Contribution of malonyl-CoA decarboxylase to the high fatty acid oxidation rates seen in the diabetic heart. *Am J Physiol* 2000;278:H1196-H1204.
132. Kantor PF, Lucien A, Kozak R, Lopaschuk GD. The anti-anginal drug trimetazidine shifts cardiac energy metabolism from fatty acid oxidation to glucose oxidation by inhibiting mitochondrial long chain 3-ketoacyl CoA thiolase. *Circ Res* 2000;86:580-588.
133. Kline JA, Thornton LR, Lopaschuk GD, Barbee RW, Watts JA. Lactate improves cardiac efficiency after hemorrhagic shock. *Shock* 2000;14:215-221.
134. Dyck JRB, Berthiaume L, Kantor PF, Barr AJ, Singh D, Hopkins TA, Voilley N, Prentki M, Lopaschuk GD. Characterization of rat liver malonyl-CoA decarboxylase and the study of its role in regulating fatty acid metabolism. *Biochem J* 2000;350:599-608.
135. Wambolt RB, Henning SL, English DR, Dyachkova Y, Lopaschuk GD, Allard M. Dichloroacetate improves postischemic function of hypertrophied rat hearts. *J Am Coll Cardiol* 2000;36:1378-1385.
136. Ford WR, Jugdutt BI, Lopaschuk GD, Schulz R and Clanachan AS. Influence of beta-adrenoreceptor tone on the cardioprotective efficacy of adenosine A(1) activation in isolated working rat hearts. *Br J Pharmacol* 2000;131:537-545.
137. Barr R, Lopaschuk GD. Methodology for measuring in vitro/ex vivo cardiac energy metabolism. *J Pharmacol Toxicol Methods* 2000;43:141-152.
138. Taniguchi M, Wilson C, Hunter CA, Pehowich D, Clanachan AS, Lopaschuk GD. Dichloroacetate improves cardiac efficiency after ischemia independent of changes in mitochondrial proton leak. *Am J Physiol* 2001;280:H1762-H1769.

139. Custalow CC, Watts JA, Lopaschuk GD. Role of fatty acids in the recovery of cardiac function during resuscitation from hemorrhagic shock. *Shock* 2001;15:231-238.
140. Longnus SL, Wambolt RB, Barr RL, Lopaschuk GD, Allard MF. Regulation of myocardial fatty acid oxidation by substrate supply. *Am J Physiol* 2001;281:H1561-H1567.
141. Finck BN, Lehman JJ, Leone TC, Welch MJ, Bennett MJ, Kovacs A, Han X, Gross RW, Kozak R, Lopaschuk GD, Kelly DP. The cardiac phenotype induced by PPAR α overexpression mimics that caused by diabetes mellitus. *J Clin Invest* 2002;109:121-130.
142. Liu Q, Docherty JC, Rendell JCT, Clanachan AS, Lopaschuk GD. High levels of fatty acid delay the recovery of intracellular pH and cardiac efficiency in postischemic hearts by inhibiting glucose oxidation. *J Am Coll Cardiol* 2002;39:718-725.
143. Michelakis ED, McMurtry MS, Wu XC, Dyck JRB, Moudgil R, Hopkins T, Lopaschuk GD, Archer SA. Dichloroacetate, a metabolic modulator, prevents and reverses chronic hypoxic pulmonary hypertension in rats: Role of increased expression and activity of voltage-gated potassium channels. *Circulation* 2002;105:244-250.
144. Lopaschuk GD, Rebeyka IM, Allard MF. Metabolic Modulation: A means to mend a broken heart. *Circulation* 2002;105:140-142.
145. Campbell FM, Kozak R, Wagner A, Altarejos JY, Dyck JRB, Belke DD, Severson DL, Kelly DP, Lopaschuk GD. A role for peroxisome proliferator-activated receptor α (PPAR α) in the control of cardiac malonyl CoA levels. *J Biol Chem* 2002;277:4098-4103.
146. Recchia FA, Osorio JC, Chandler MP, Xu X, Panchal AR, Lopaschuk GD, Hintze TH, Stanley WC. Reduced synthesis of NO causes marked alterations in myocardial substrate metabolism in conscious dogs. *Am J Physiol* 2002;282:E197-E206.
147. Leong HS, Grist M, Parsons H, Wambolt RB, Lopaschuk GD, Brownsey R, Allard MF. Accelerated rates of glycolysis in the hypertrophied heart: Are they a methodological artifact? *Am J Physiol* 2002;282:E1039-E1045.
148. Atkinson LA, Kelly SE, Russell JC, Bar-Tana J, Lopaschuk GD. MEDICA 16 inhibits hepatic acetyl-CoA and reduces plasma triacylglycerol levels in insulin resistant JCR:LA-cp rats. *Diabetes* 2002;51:1548-1555.
149. Xu Y, Kumar D, Dyck JRB, O'Brien DW, Ford WR, Clanachan AS, Lopaschuk GD, Jugdutt BI. AT(1) and AT(2) receptor expression and blockade after acute ischemia-reperfusion in isolated working rat hearts. *Am J Physiol* 2002;282:H1206-H1215.
150. Atkinson LA, Fischer MA, Lopaschuk GD. Leptin activated cardiac fatty acid oxidation independent of changes in the AMP-activated protein kinase-acetyl-CoA carboxylase-malonyl CoA axis. *J Biol Chem* 2002;277:29424-29430
151. Osorio JC, Stanley WC, Linke A, Castellari M, Diep ON, Panchan AR, Hintze TH, Lopaschuk GD, Recchia FA. Impaired myocardial fatty acid oxidation and reduced protein expression of retinoid X receptor-alpha in pacing-induced heart failure. *Circulation* 2002;106: 606-612 .
152. Dyck JRB and Lopaschuk GD. Malonyl CoA control of fatty acid oxidation in the ischemic heart. *J Mol Cell Cardiol* 2002;34:1099.

153. Besikci A, Campbell FM, Hopkins TA, Dyck JRB, Lopaschuk GD. Relative importance of malonyl CoA and carnitine in the maturation of fatty acid oxidation in the newborn rabbit heart. *Am J Physiol* 2003;284:H283-H289.
154. Atkinson LL, Kozak R, Kelly SE, Onay-Besikci A, Russell JC, Lopaschuk GD. Potential mechanisms and consequences of cardiac triacylglycerol accumulation in insulin resistant rats. *Am J Physiol* 2003;284:E923-E930.
155. Hopkins TA, Sugden MC, Holness MJ, Kozak R, Dyck JR, Lopaschuk GD. Control of cardiac pyruvate dehydrogenase activity in peroxisome proliferator-activated receptor- α transgenic mice. *Am J Physiol* 2003;285:H270-H276.
156. Lopaschuk GD, Barr R, Thomas PD, Dyck JRB. Beneficial effects of trimetazidine in ex vivo working ischemic hearts are due to a stimulation of glucose oxidation secondary to inhibition of long chain 3-ketoacyl coenzyme A thiolase. *Circ Res* 2003;93:E33-E37.
157. Stanley WC, Meadows SR, Kivilo KM, Roth BA, Lopaschuk GD. α -hydroxybutyrate inhibits myocardial fatty acid oxidation in vivo independent of changes in malonyl-CoA content. *Am J Physiol* 2003;285:H1631-H1631.
158. Bamford JA, Lopaschuk GD, MacLean IM, Reinhart ML, Dixon WT, Putman CT. Effects of chronic AICAR administration on the metabolic and contractile phenotypes of rat slow- and fast-twitch skeletal muscle. *Can J Physiol* 2003;81:1072-1082.
159. Fragasso G, Piatti PM, Monti L, Palloshi A, Setola E, Pucetti P, Calori G, Lopaschuk G.D. Short- and long-term beneficial effects of trimetazidine in patients with diabetes and ischemic cardiomyopathy. *Am Heart J* 2003;146:18.
160. Kuang M, Febbraio M, Wagg C, Lopaschuk GD, Dyck JRB. Fatty acid translocase/CD36 deficiency does not energetically or functionally compromise hearts before or after ischemia. *Circulation* 2004;109:1550-1557 .
161. Lopaschuk GD. Glutamate transport in the heart: lessons learned from the brain. *J Mol Cell Cardiol* 2004;37:5-6.
162. Zhou D, Yuen P, Chu D, Thon V, McConnell S, Brown S, Tsang A, Pena M, Russell A, Cheng JF, Nazdan AM, Barbosa MS, Dyck JRB, Lopaschuk GD, Yang G. Expression, purification and characterization of human malonyl-CoA decarboxylase. *Protein Expression & Purification* 2004;34:261-269.
163. Reszko AE, Kasumov T, David F, Thomas KR, Jobbins KA, Cheng JF, Lopaschuk GD, Dyck JRB, Diaz M DesRosiers C, Stanley WC, Brunengraber H. Regulation of malonyl-CoA concentration and turnover in the normal heart. *J Biol Chem* 2004;279:34298-34301.
164. Sambandam N, Steinmetz M, Chu A, Altarejos JY, Dyck JRB, Lopaschuk GD. Malonyl-CoA decarboxylase (MCD) is differentially regulated in subcellular compartments by 5' AMP-activated protein kinase (AMPK). Studies using H9c2 cells overexpressing MCD and AMPK by adenoviral gene transfer technique. *Eur J Biochem* 2004;271:2831-2840.
165. Dyck JR, Cheng JF, Stanley WC, Barr R, Chandler MP, Brown S, Wallace D, Arhenios T, Harmon C, Yang G, Nazdan AM, Lopaschuk GD. Malonyl coenzyme a decarboxylase inhibition protects the

- ischemic heart by inhibiting fatty acid oxidation and glucose oxidation. *Circ Res* 2004;194:E78-E84.
166. Onay-Besikci A, Altarejos JY, Lopaschuk GD. gAd-globular head domain of adiponectin increases fatty acid oxidation in newborn rabbit hearts. *J Biol Chem* 2004;279:44320-44326.
 167. T Abou-Rjaily GA, Al-share QY, Yang Y, Fenstrom MA, De Angelis AM, Lee AD, Sweetman L, Amato A, Pasquale M, Lopaschuk GD, Erickson SK, Najjar SM. Interaction between altered insulin and lipid metabolism in CEACAM1-inactive transgenic mice. *J Biol Chem* 2004;279:45155-45161.
 168. León H, Atkinson L, Sawicka J, Strynadka K, Lopaschuk GD, Schulz R. Pyruvate prevents cardiac dysfunction and AMP-activated protein kinase activation by hydrogen peroxide in isolated rat hearts. *Can J Physiol Pharmacol* 2004;82:409-416.
 169. Altarejos JY, Taniguchi M, Clanachan AS, Lopaschuk GD. Myocardial ischemia differentially regulates LKB1 and an alternate 5'AMP-activated protein kinase kinase. *J Biol Chem* 2005;280:183-190.
 170. Sheth SS, Castellani LW, Chari S, Wagg C, Thippavong CK, Bodnar JS, Tontonoz P, Attie AD, Lopaschuk GD, Lusic AJ. Thioredoxin interacting protein (Txnip) deficiency disrupts the fasting-feeding metabolic transition. *J Lipid Res* 2005;46:123-134 .
 171. Stanley WC, Recchia FA, Lopaschuk GD. Myocardial substrate metabolism in the normal and failing heart. *Physiol Rev* 2005;85:1093-1129.
 172. Al-Hesayen A, Azevedo ER, Floras JS, Hollingshead S, Lopaschuk GD and Parker JD. Selective versus nonselective beta-adrenergic receptor blockade in chronic heart failure: differential effects on myocardial energy substrate utilization. *Eur J Heart Fail* 2005;7:618-623.
 173. King KL, Okere IC, Sharma N, Dyck JR, Reszko AE, McElfresh T, Kerner J, Candler MP, Lopaschuk GD, Stanley WC. Regulation of cardiac malonyl-CoA content and fatty acid oxidation during increased cardiac power. *Am J Physiol* 2005;289:H1033-H1037.
 174. Stanley WC, Morgan EE, Huang H, McElfresh T, Sterk JP, Okere IC, Chandler MP, Cheng J, Dyck JR, Lopaschuk GD. Malonyl-CoA decarboxylase inhibition suppresses fatty acid oxidation and reduces lactate production during demand-induced ischemia. *Am J Physiol* 2005;289:H2304-H2309.
 175. Sambandam N, Morabito D, Wagg C, Finck BN, Kelly DP, Lopaschuk GD. Chronic activation of PPAR α is detrimental to cardiac recovery after ischemia. *Am J Physiol* 2006;290:H87-H95.
 176. Degrado TR, Kitapci MT, Wang S, Ying J, Lopaschuk GD. Validation of 18F-fluoro-4-thia-palmitate as PET probe for myocardial fatty acid oxidation: Effects of hypoxia and composition of exogenous fatty acid. *J Nucl Med* 2006;47:173-181.
 177. Cheng JF, Chen M, Wallace D, Tith S, Haramura M, Liu B, Mak CC, Arrhenius T, Reily S, Brown S, Thorn V, Harmon C, Barr R, Dyck JRB, Lopaschuk G, Nadzan AM. Synthesis and structure – activity relationship of small-molecule malonyl Coenzyme A decarboxylase inhibitors. *J Med Chem* 2006;49:1517-1525.
 178. Huang W, Dedousis N, Bandi A, Lopaschuk GD, O'Doherty RM. Liver triglyceride secretion and lipid oxidative metabolism are rapidly altered by leptin in vivo. *Endocrinology* 2006;147:1480-1487.
 179. Collier CA, Bruce CR, Smith AC, Lopaschuk GD, Dyck JRB. Metformin counters the insulin-induced suppression of fatty acid oxidation and stimulation of triacylglycerol storage in rodent skeletal muscle.

Am J Physiol 2006;291:E182-E189.

180. Folmes CL, Clanachan AS, Lopaschuk GD. Fatty acids attenuate insulin regulation of 5'-AMP-activated protein kinase and insulin cardioprotection after ischemia. *Circ Res* 2006;99:61-68.
181. Dyck JR and Lopaschuk GD. AMPK alterations in cardiac physiology and pathology: enemy or ally? *J Physiol* 2006;574:95-112 .
182. Lopaschuk GD. Cardiac energy metabolism alterations in angiotensin II induced hypertrophy. *J Moll Cell Cardiol* 2006;41:418-420.
183. Cheng JF, Huang Y, Penuliar R, Nishimoto M, Liu L, Arrhenius T, Yang G, O'leary E, Barbosa M, Barr R, Dyck JR, Lopaschuk GD, Nadzan AM. Discovery of potent and orally available malonyl-CoA decarboxylase inhibitors as cardioprotective agents. *J Med Chem* 2006;49:4055-4058 .
184. Fragasso G, Montano C, Perseghin G, Palloschi A, Calori G, Lattuada G, Oggioni S, Bassanelli G, Locatelli M, Lopaschuk GD, Margonato A. The anti-ischemic effect of trimetazidine in patients with postprandial myocardial ischemia is unrelated to meal composition. *Am Heart J* 2006;151:1238.E1-E8.
185. Cheng JF, Mak CC, Huang Y, Penuliar R, Nishimoto M, Zhang L, Chen M, Wallace D, Arrhenius T, Chu D, Yang G, Barbosa M, Barr R, Dyck JR, Lopaschuk GD, Nadzan, A.M. Heteroaryl substituted bis-trifluoromethyl carbinols as malonyl-CoA decarboxylase inhibitors. *Bioorg Med Chem Lett* 2006;16:3484-3488.
186. Noga AA, Soltys CL, Barr AJ, Kovacic S, Lopaschuk GD, Dyck JR. Expression of an active LKB1 complex in cardiac myocytes results in decreased protein synthesis associated with phenylephrine-induced hypertrophy. *Am J Physiol* 2006;292:H1460-H1469.
187. Dyck JRB, Hopkins TA, Bonnet S, Michelakis E, Young ME, Watanabe Y, Kawase Y, Jishage, K., Lopaschuk GD. Absence of malonyl CoA decarboxylase in mice increases cardiac glucose oxidation and protects the heart from ischemic injury. *Circulation* 2006;114:1721-1728.
188. Lopaschuk GD and Stanley W. Malonyl-CoA decarboxylase inhibition as a novel approach to treat ischemic heart disease. *Cardiovasc Drugs Ther* 2006;20:433-439.
189. Bonnet S, Archer SL, Allalunis-Turner J, Haromy A, Beaulieu C, Thompson R, Lee CT, Lopaschuk GD, Puttagunta L, Bonnet SN, Harry G, Hashimoto K, Thebaud B, Michelakis E. A Mitochondria-K⁺ Channel Axis is suppressed in cancer and its normalization promotes apoptosis and inhibits cancer growth. *Cancer Cell* 2007;11:37-51.
190. Putnam CT, Martins KJ, Gallo ME, Lopaschuk GD, Pearcey JA, Maclean Im, Saranchuk RJ, Pette D. {alpha}-Catalytic subunits of 5'AMP-activated protein kinase display fiber specific expression and are upregulated by chronic low-frequency stimulation in rat muscle. *Am J Physiol* 2007;293:R1325-R1334.
191. Szczesna-Cordary D, Jones M, Moore JR, Watt J, Kerrick WG, Wu Y, Wang Y, Wagg C, Lopaschuk GD. Myosin regulatory light chain E22K mutation results in decreased cardiac intracellular calcium and force transients. *FASEB J* 2007;21:3974-3985.
192. Wallis GA, Friedlander AL, Jacobs KA, Horning MA, Fattor JA, Wolfel EE, Lopaschuk GD, Brooks GD. Substantial working muscle glycerol turnover during two-legged cycle ergometry. *Am J Physiol* 2007;293:E950-E957.

193. Gao S, Kinzig KP, Aja S, Scott KA, Keung W, Kelly S, Strynadka K, Chohan S, Smith WW, Tamashiro, KL, Ladenheim EE, Ronnett GV, Tu Y, Birnbaum MJ, Lopaschuk GD, Moran TH. Leptin activates hypothalamic acetyl-CoA carboxylase to inhibit food intake. *Proc Natl Acad Sci* 2007;104: 17358-17363.
194. Zhou L, Huang H, Yuan CL, Keung W, Lopaschuk GD, Stanley WC. Metabolic response to an acute jump in cardiac workload: effects on malonyl-CoA, mechanical efficiency, fatty acid oxidation. *Am J Physiol* 2007;294: H954-H960.
195. Onay-Besikci A, Wagg C, Lopaschuk TP, Keung W, Lopaschuk GD. Alpha-lipoic acid increases cardiac glucose oxidation independent of AMP-activated protein kinase in isolated working rat hearts. *Basic Res Cardiol* 2007;102:436-444 .
196. Carley AN, Atkinson LL, Bonen A, Harper ME, Kunnathu S, Lopaschuk GD, Severson DL. Mechanisms responsible for enhanced fatty acid utilization by perfused hearts from type 2 diabetic db/db mice. *Arch Physiol Biochem* 2007;113:65-75.
197. Lopaschuk GD, Folmes C, Stanley W. Cardiac energy metabolism in obesity. *Circ Res* 2007;102:335-347.
198. Koves TR, Ussher JR, Slentz D, Mosedale M, Ilkayeva O, Bain J, Stevens R, Dyck J, Newgard CB, Lopaschuk GD and Muoio DM. Mitochondrial overload and incomplete fatty acid oxidation contribute to skeletal muscle insulin resistance. *Cell Metabolism* 2008;7:45-56.
199. Khairallah RJ, Khairallah M, Gelinis R, Bouchard B, Young ME, Allen BG, Lopaschuk GD, Deschepper CF, Des Rosiers C. Cyclic GMP signaling in cardiomyocytes modulates fatty acid trafficking and prevents triglyceride accumulation. *J Mol Cell Cardiol* 2008;45:230-239.
200. Lopaschuk GD, Kelly DP. Signalling in Cardiac Metabolism. *Cardiovasc Res* 2008;79:205-207.
201. Lei B, Chess DJ, Keung W, O'Shea KM, Lopaschuk GD, Stanley WC. Transient activation of P38 MAP kinase and up-regulation of Pim-1 kinase in cardiac hypertrophy despite no activation of AMPK. *J Mol Cell Cardiol* 2008;45:404-410.
202. Yatscuff MA, Jaswal JS, Grant MR, Greenwood R, Lukat T, Beker DL, Rebeyka IM, Lopaschuk GD. Myocardial hypertrophy and the maturation of fatty acid oxidation in the newborn human heart. *Ped Res* 2008;64:643-647.
203. Fert-Bober J, Sawicki G, Lopaschuk GD, Cheung PY. Proteomic analysis of cardiac metabolic enzymes in asphyxiated newborn piglets. *Mol Cell Biochem* 2008;318:13-21.
204. Wang L, Lopaschuk GD, Clanachan AS. H₂O₂-induced left ventricular dysfunction in isolated working rat hearts is independent of calcium accumulation. *J Mol Cell Cardiol* 2008;45: 787-795.
205. Ussher JR and Lopaschuk GD. The malonyl CoA axis as a potential target for treating ischemic heart disease. *Cardiovasc Res* 2008;79:259-268
206. Abraham TP, Jones M, Kazmierczak K, Liang HY, Pinheiro AC, Wagg CS, Lopaschuk GD, Szczesna-Cordary D. Diastolic dysfunction in familial hypertrophic cardiomyopathy transgenic model mice. *Cardiovasc Res* 2009;82:84-92.
207. Folmes CD, Sowah D, Clanachan AS, Lopaschuk GD. High rates of fatty acid oxidation during mild

ischemia decreases cardiac work and efficiency. *J Mol Cell Cardiol* 2009;47:142-148.

208. Wang X, Chow FL, Oka T, Hao L, Lopez-Campistrous A, Kelly S, Cooper S, Odenbach J, Finegan BA, Schulz R, Kassiri A, Lopaschuk GD. and Fernandez-Patron, C. Matrix metalloproteinase-7 and ADAM-12 (a disintegrin and metalloproteinase-12) define a signaling axis in agonist-induced hypertension and cardiac hypertrophy. *Circulation* 2009;119:2480-2489.
209. Folmes CD, Wagg CS, Shen M, Folmes, Clanachan AS, Tian R, Lopaschuk GD. Suppression of AMP-activated protein kinase activity does not impair recovery of contractile function during reperfusion of ischemic hearts. *Am J Physiol* 2009;297:H313-H321.
210. Yan J, Young ME, Cui L, Lopaschuk GD, Liao R, Tian R. Increased glucose uptake and oxidation in mouse hearts prevent high fatty acid oxidation but cause cardiac dysfunction in diet-induced obesity. *Circulation* 2009;119:2818-2828.
211. Ussher JR, Koves TR, Jaswal JJ, Zhang L, Ilkayeva O, Dyck JR, Muoio DM, Lopaschuk GD. Insulin-stimulated cardiac glucose oxidation is increased in high fat diet- induced obese mice lacking malonyl CoA decarboxylase. *Diabetes* 2009;58:1766-1765.
212. Wang X, Oka T, Chow FL, Cooper SB, Odenbach J, Lopaschuk GD, Kassiri Z, Fernandez-Patron C. Tumor Necrosis Factor {alpha}-Converting Enzyme is a key regulator of agonist-induced cardiac hypertrophy and fibrosis. *Hypertension* 2009;54:575-582.
213. Ussher JR, Jaswal JJ, Wagg CS, Armstrong HE, Keung W, Lopaschuk GD. Role of the atypical protein kinase Czeta in regulation of 5'-AMP-activated protein kinase in cardiac and skeletal muscle. *Am J Physiol* 2009;297:E349-E57 .
214. Ussher JR, Lopaschuk GD. Targeting malonyl CoA inhibition of mitochondrial fatty acid uptake as an approach to treat cardiac ischemia/reperfusion. *Basic Res Cardiol* 2009;104:203-210.
215. Basu R, Oudit GY, Wang X, Ussher JR, Lopaschuk GD, Kassiri, Z. Type 1 diabetic cardiomyopathy in the Akita (Ins2WT/C96Y) mouse model is characterized by diastolic dysfunction with preserved systolic function. *Am J Physiol* 2009;297:H2096-H2108.
216. Zhang L, Keung W, Samokhvalov V, Wang W and Lopaschuk GD. Role of fatty acid uptake and fatty acid beta-oxidation in mediating insulin resistance in heart and skeletal muscle. *Biochim Biophys Acta* 2010;1801:1-22 .
217. Piao L, Fang YH, Cadete V, Wietholt C, Urboniene D, Toth P, Marsboom G, Zhang H, Haber I, Rehman J, Lopaschuk GD, Archer S. The inhibition of pyruvate dehydrogenase kinase improves impaired cardiac function and electric remodeling in two models of right ventricular hypertrophy: resuscitating the hibernating right ventricle. *J Mol Med* 2010;88:47-60.
218. Lopaschuk GD, Ussher JR, Folmes CD, Jaswal JS. and Stanley WC. Myocardial fatty acid metabolism in health and disease. *Physiol Rev* 2010;90:207-258.
219. Carvalho RA, Sousa RPB, Cadete VJJ, Lopaschuk GD, Palmeira CMM, Bjork JA and Wallace KB. Metabolic remodeling associate with subchronic doxorubicin cardiomyopathy. *Toxicology* 2010;270:92-98.
220. Ito M, Jaswal JS, Lam VH, Oka T, Zhang L, Beker DL, Lopaschuk GD and Rebeyka IR. High levels of fatty acids increase contractile function of neonatal rabbit hearts during reperfusion following ischemia.

Am J Physiol 2010;298:H1426-1437 .

221. Niu W, Bilan PJ, Ishikura S, Schertzer JD, Contreras-Ferrat A, Fu Z, Liu J, Boguslavsky S, Foley KP, Liu Z, Li J, Chu G, Panakkezhum T, Lopaschuk GD, Lavandero S, Yao Z, Klip A. Contraction-related stimuli regulate GLUT4 traffic in C2C12-GLUT4 myc skeletal muscle cells. *Am J Physiol* 2010;298:E1058-E1071 .
222. Lopaschuk GD, Ussher JR and Jaswal JS. Targeting intermediary metabolism in the hypothalamus as a mechanism to regulate appetite. *Pmcol Rev* 2010;62:237-264.
223. Jessen N, Koh HJ, Folmes, C.D, Wagg C, Fujii N, Lofgren B, Wolf CM, Berul CI, Hirschman MF, Lopaschuk, GD. and Goodyear, LJ. Ablation of LKB1 in the heart leads to energy deprivation and impaired cardiac function. *Biochim Biophys Acta* 2010;1802: 593-600.
224. Ussher JR, Koves TR, Cadete VJ, Zhang L, Jaswal JS, Swyrd SJ, Lopaschuk DG, Proctor SD, Keung W, Muoio DM, Lopaschuk GD. Inhibition of de novo ceramide synthesis reverses diet-induced insulin resistance and enhances whole body oxygen consumption. *Diabetes* 2010;59:2453-2464.
225. Sutendra G, Bonnet S, Rochefort G, Haromy A, Folmes KD, Lopaschuk GD, Dyck JRB and Michelakis ED. Fatty acid oxidation and malonyl CoA decarboxylase in the vascular remodeling of pulmonary hypertension. *Science (Trans Med)* 2010;11:44ra58.
226. Scott JM, Esch BT, Haykowsky MJ, Paterson I, Warburton DE, Chow K, Baron JC, Lopaschuk GD and Thompson RB. Effects of high intensity exercise on biventricular function assessed by cardiac magnetic resonance imaging in endurance training and normally active individuals. *Am J Cardiol* 2010;106:278-283.
227. Folmes CD, Sawicki G, Cadete VJ, Masson G, Barr AJ and Lopaschuk GD. Novel O-palmitoylated beta E1 subunit of pyruvate dehydrogenase is phosphorylated during ischemia/ reperfusion injury. *Proteome Sci* 2010;8:38.
228. Dolinsky VW, Morton JS, Oka T, Robillard-Fraynem I, Bagdan M, Lopaschuk GD, Des Rosiers C, Walsh K, Davidge ST and Dyck JRB. Calorie restriction prevents hypertension and cardiac hypertrophy in the spontaneously hypertensive rat. *Hypertension* 2010;56:412-421.
229. Jaswal JS, Lund CR, Keung W, Beker DL, Rebeyka IR and Lopaschuk GD. Isoproterenol stimulates 5'-AMP activated protein kinase and fatty acid oxidation in neonatal hearts. *Am J Physiol* 2010;299:H1135-1145 .
230. Wang L, Ko KWS, Lucchinetti E, Zhang L, Troxler H, Hersberger M, Omar MA, Posse de Chaves EI, Lopaschuk GD, Clanachan AS and Zaugg M. Metabolic profiling of hearts exposed to sevoflurane and propofol reveals distinct regulation of fatty acid and glucose oxidation. *Anesthesiology* 2010;113:541-551.
231. Kandalam V, Basu R, Abraham T, Wang X, Awad A, Wang W, Lopaschuk GD, Maeda N, Oudit GY and Kassiri Z. Early activation of matrix metalloproteinases underlies the exacerbated systolic and diastolic dysfunction in mice lacking TIMP3 following myocardial infarction. *Am J Physiol* 2010;299:H101-H1023.
232. Keung W, Cadete VJ, Palaniyappan A, Jablonski A, Fischer M and Lopaschuk GD. Intracerebroventricular leptin administration differentially alters cardiac energy metabolism in mice fed a low fat and high fat diet. *J Cardiovasc Pharmacol* 2010;57:103-113.

233. Odenbach J, Wang X, Cooper S, Chow FL, Oka T, Lopaschuk GD, Kassirir Z and Fernandez-Patron C. MMP-2 mediates angiotensinII-induced hypertension under the transcriptional control of MMP-7 and TACE. *Hypertension* 2010;57:123-130.
234. Chambers KT, Leone TC, Sambandam N, Kovacs A, Wagg CS, Lopaschuk GD, Finck BN and Kelly DP. Chronic inhibition of pyruvate dehydrogenase in heart triggers an adaptive metabolic response. *J Biol Chem* 2011;286:11155-11162.
235. Mraiche F, Wagg CS, Lopaschuk GD and Fliegel L. Elevated levels of activated NHE1 protect the myocardium and improve metabolism following ischemia/ reperfusion injury. *J Mol Cell Cardio* 2011;50:157-164.
236. Zhang L, Ussher JR, Oka T, Cadete VJ, Wagg C, Lopaschuk GD. Cardiac diacylglycerol accumulation in high fat-fed mice is associated with impaired insulin-stimulated glucose oxidation. *Cardiovasc Res* 2011;89:148-56.
237. Rueda-Clausen CF, Morton JS, Lopaschuk GD and Davidge ST. Long-term effects of intrauterine growth restriction on cardiac metabolism and susceptibility to ischemia reperfusion. *Cardiovasc Res* 2011;90:285-294.
238. Jaswal JS, Keung W, Wang W, Ussher JR, Lopaschuk GD. Targeting fatty acid and carbohydrate oxidation--a novel therapeutic intervention in the ischemic and failing heart. *Biochim Biophys Acta* 2011;1813:1333-50
239. Lucchinetti E, Wang L, Ko KW, Troxler H, Hersberger M, Zhang L, Omar MA, Lopaschuk GD, Clanachan AS, Zaugg M. Enhanced glucose uptake via GLUT4 fuels recovery from calcium overload after ischaemia-reperfusion injury in sevoflurane- but not propofol-treated hearts. *Br J Anaesth* 2011;106:792-800.
240. Kudej RK, Fasano M, Zhao X, Lopaschuk GD, Fischer SK, Vatner DE, Vatner SF, Lewandowski ED. Second window of preconditioning normalizes palmitate use for oxidation and improves function during low-flow ischaemia. *Cardiovasc Res* 2011;92:394-400.
241. Keung W, Palaniyappan A, Lopaschuk, GD. Chronic central leptin decreases food intake and improves glucose tolerance in diet-induced obese mice independent of hypothalamic malonyl CoA levels and skeletal muscle insulin sensitivity. *Endocrinology* 2011;152:4127-37.
242. Gao S, Keung W, Serra D, Wang W, Carrasco P, Cassals N, Hegardt FG, Moran TH and Lopaschuk GD. Malonyl-CoA mediates leptin hypothalamic control of feeding independent of inhibition of CPT-1a. *Am J Physiol* 2011;301:R209-R217.
243. Gao S, Zhu G, Gao X, Wu D, Carrasco P, Casals N, Hegardt FG, Moran TH and Lopaschuk GD. Important roles of brain-specific carnitine palmitoyltransferase and ceramide metabolism in leptin hypothalamic control of feeding. *Proc Natl Acad Sci USA* 2011;108:9691-9696.
244. Axelsen LN, Keung W, Pedersen HD, Meier E, Riber D, Kjølbye AL, Petersen JS, Proctor SD, Holstein-Rathlou NH, Lopaschuk GD. Glucagon and a glucagon-GLP-1 dual-agonist increases cardiac performance with different metabolic effects in insulin-resistant hearts. *Br J Pharmacol* 2012;165:2736-48.
245. Lopaschuk GD and Jaswal JS. Hypoxia-induced adaptation to mitral regurgitation: a role for K ATP

channel up-regulation? *J Am Coll Cardiol* 2012;59:397-9.

246. Oka T, Lam VH, Zhang L, Keung W, Cadete VJ, Samokhvalov V, Tanner BA, Beker DL, Ussher JR, Huqi A, Jaswal JS, Rebeyka IM and Lopaschuk GD. Cardiac hypertrophy in the newborn delays the maturation of fatty acid β -oxidation and compromises post-ischemic functional recovery. *Am J Heart Circ Physiol* 2012;302:H1784-H1794.
247. Zhang L, Mori J, Wagg C and Lopaschuk GD. Activating cardiac E2F1 induces up-regulation of pyruvate dehydrogenase kinase 4 in mice on a short term of high fat feeding. *FEBS letters* 2012;586:996-1003.
248. Lopaschuk GD and Ussher JR. An ACE up your sleeve: 2 is better than 1. *Circ Res* 2012;10:1270-1272.
249. Ussher JR, Wang W, Ghandi M, Keung W, Samokhvalov V, Oka T, Wagg CS, Jaswal JS, Harris RA, Clanachan AS, Dyck JD and Lopaschuk GD. Stimulation of glucose oxidation protects against acute myocardial infarction and reperfusion injury. *Cardiovasc Res* 2012;94:359-369.
250. Borthwick F, Warnakula S, Mangat R, Russell JC, Kelly Se, Lee CY, Hryshko L, Mamo JC, Rye KA, Lopaschuk GD and Proctor SD. ApoA-1 infusion reduces arterial cholesterol and myocardial lesions in a rat model of cardiac dysfunction and insulin resistance. *Atherosclerosis* 2012;222:402-408.
251. Ussher JR, Folmes CD, Keung W, Fillmore N, Jaswal JS, Cadete VJ, Beker DL, Lam VH, Zhang L and Lopaschuk GD. Inhibition of serine palmitoyl transferase I reduces cardiac ceramide levels and increases glycolysis rates following diet-induced insulin resistance. *PLoS One* 2012;7:E37703.
252. Cadete VJ, Sawicka J, Jaswal J, Lopaschuk GD, Schulz RS, Szczena-Cordary D and Sawicki G. Ischemia/reperfusion-induced myosin light chain 1 phosphorylation increases its degradation by matrix metalloproteinase-2. *FEBS J* 2012;279:2444-2454.
253. Ussher, J.R., Jaswal, J.S. and Lopaschuk, G.D. Pyridine nucleotide regulation of cardiac intermediary metabolism. *Circ. Res.* 111:628-641 (2012).
254. Mori J, Basu R, McLean BA, Das SK, Zhang L, Patel VB, Wagg CS, Kassiri Z, Lopaschuk GD and Oudit GY. Agonist-induced hypertrophy and diastolic dysfunction is associated with selective reduction in glucose oxidation: A metabolic contribution to heart failure with normal ejection fraction. *Circ Heart Fail* 2012;5:493-503.
255. Lopaschuk GD and Jaswal JS. A role for period 2 in cardioprotection. *Cell Metab* 2012;16:2-4.
256. Lopaschuk GD. The challenge of treating diastolic heart failure. *Heart Metabolism* 2012;57:1-2.
257. Fillmore N and Lopaschuk GD. How the heart relaxes. *Heart Metabolism* 2012;57:1-4.
258. Samokhvalov V, Ussher JR, Fillmore N, Armstrong IK, Keung W, Moroz D, Lopaschuk DG, Seubert, JM, Lopaschuk GD. Inhibition of malonyl CoA decarboxylase reduces the inflammatory response associated with insulin resistance. *Am J Physiol Endocrinol Metab* 2012;303:E1459-1468.
259. Cherian S, Lopaschuk GD, Carvalho E. Cellular cross-talk between epicardial adipose tissue and myocardium in relation to the pathogenesis of cardiovascular disease. *Am J Physiol Endocrinol Metab* 2012;303:E937-949.
260. Jaswal JS, Ussher JR, Lopaschuk GD, Johnstone DE. Something old holds potential to be something new in heart failure: Allopurinol revisited. *Can J Cardiol* 2012;28:626-628.

261. Fillmore N, Lopaschuk GD. Targeting mitochondrial oxidative metabolism as an approach to treat heart failure. *Biochim Biophys Acta* 2013;1833:857-865.
262. Keung W, Ussher J, Jaswal J, Raubenheimer M, Lam V, Wagg C, Lopaschuk G. Inhibition of carnitine palmitoyltransferase-1 activity alleviates insulin resistance in diet-induced obese mice. *Diabetes* 2013;62:711-720.
263. Wu G, Zhang L, Li T, Lopaschuk GD, Vance DE and Jacobs RL. Choline deficiency attenuates body weight gain and improves glucose tolerance in ob/ ob mice. *J Obesity* 2013;288:837-847.
264. Wu G, Zhang L, Li T, Lopaschuk GD, Jacobs R, Vance DE. Choline supplementation promotes hepatic insulin resistance in phosphatidylethanolamine N-methyltransferase-deficient mice via increased glucagon action. *J Biol Chem* 2013;288: 837-847.
265. Lewandowski ED, Fischer SK, Fasano M, Banke NH, Walker LA, Huqi A, Wang X, Lopaschuk GD, O'Donnell JM. Acute L-CPT1 overexpression recapitulates reduced palmitate oxidation of cardiac hypertrophy. *Circ Res* 2013;112:57-65.
266. Zhabyeyev P, Gandhi M, Mori J, Basu R, Kassiri Z, Clanachan A, Lopaschuk GD, Oudit GY. Pressure-overload induced heart failure induces a selective reduction in glucose oxidation at physiological afterload. *Cardiovasc Res* 2013;97:676-685.
267. Piao L, Sidhu VK, Fang YH, Ryan JJ, Parikh KS, Hong Z, Toth PT, Morrow E, Kutty S, Lopaschuk GD, Archer SL. FOXO1-mediated upregulation of pyruvate dehydrogenase kinase-4 (PDK4) decreases glucose oxidation and impairs right ventricular function in pulmonary hypertension: therapeutic benefits of dichloroacetate. *J Mol Med* 2013;91:333-346.
268. Lee D, Oka T, Hunter B, Robinson A, Papp S, Nakamura K, Srisakuldee W, Nickel BE, Light PE, Dyck JR, Lopaschuk GD, Kardami E, Opas M and Michalak M. Calreticulin induces dilated cardiomyopathy. *PLoS One* 2013;8(2):e56387 .
269. Mori J, Alrob OA, Wagg CS, Harris RA, Lopaschuk GD and Oudit GY. Ang II causes insulin resistance and induces cardiac metabolic switch and inefficiency: a critical role of PDK4. *Am J Physiol Heart Circ Physiol* 2013;304:H1103-1113.
270. Gill R, Lee TF, Manouchehri N, Liu JQ, Lopaschuk G, Bigam DL and Cheung PY. Postresuscitation cyclosporine treatment attenuates myocardial and cardiac mitochondrial injury in newborn piglets with asphyxia-reoxygenation. *Crit Care Med* 2013;41:1069-1074.
271. Singh KK, Shukla PC, Yanagawa B, Quan A, Lovren F, Pan Y, Wagg CS, Teoh H, Lopaschuk GD. and Verma S. Regulating cardiac energy metabolism and bioenergetics by targeting the DNA damage repair protein BRCA1. *J Thorac Cardiovasc Surg* 2013;146:702-709.
272. Gao S, Serra D, Keung W, Hegardt FG, Lopaschuk GD. Important role of ventromedial hypothalamic carnitine palmitoyltransferase-1a in the control of food intake. *Am J Physiol Endocrinol Metab* 2013;305:E336-347.
273. Dolinsky VW, Chakrabarti S, Pereira TJ, Oka T, Levasseur J, Beker D, Zordoky BN, Morton JS, Nagendran J, Lopaschuk GD, Davidge ST, Dyck JR. Resveratrol prevents hypertension and cardiac hypertrophy in hypertensive rats and mice. *Biochim Biophys Acta* 2013;1832:1723-1733.

274. Gao S, Casals N, Keung W, Moran TH, Lopaschuk GD. Differential effects of central ghrelin on fatty acid metabolism in hypothalamic ventral medial and arcuate nuclei. *Physiol Behav* 2013;118:165-170.
275. Ussher J and Lopaschuk GD. Cardiac insulin resistance: It's sweeter than you think. *Endocrinology* 2013;154:2575-2578.
276. Mori J, Zhang L, Oudit GY, Lopaschuk GD. Impact of the renin-angiotensin system on cardiac energy metabolism in heart failure. *J Mol Cell Cardiol* 2013;63:98-106.
277. Zhang L, Jaswal JS, Ussher JR, Sankaralingam S, Wagg C, Zaugg M, Lopaschuk GD. Cardiac insulin resistance and decreased mitochondrial energy production precede the development of systolic heart failure following pressure overload hypertrophy. *Circ Heart Fail* 2013;6:1039-1048.
278. Shrivastav S, Zhang L, Okamoto K, Lee H, Lagranha C, Abe Y, Balasubramanyam A, Lopaschuk GD, Kino T, Kopp JB. HIV-1 Vpr enhances PPAR β/δ -mediated transcription, increases PDK4 expression and reduces PDK activity. *Mol Endocrinol* 2013;27:1564-1576.
279. Ussher JR, Lopaschuk GD, Arduini A. Gut microbiota metabolism of L-carnitine and cardiovascular risk. *Atherosclerosis*. 2013;231:456-61.
280. Gao S, Moran TH, Lopaschuk GD, Butler AA. Hypothalamic malonyl-CoA and the control of food intake. *Physiol Behav* 2013;122:17-24.
281. Zhang L, Yu X, Cheyesh A, Rebeyka IM, Granoski D, Lopaschuk GD, Li J. Plasma fatty acid levels in children during extracorporeal membrane oxygenation support-a pilot study. *J Extra Corpor Technol* 2013;45(4):242-247.
283. Masoud WG, Ussher JR, Wang W, Jaswal JS, Wagg CS, Dyck JR, Lygate CA, Neubauer S, Clanachan AS, Lopaschuk GD. Failing mouse hearts utilize energy inefficiently and benefit from improved coupling of glycolysis and glucose oxidation. *Cardiovasc Res* 2014;101:30-38.
284. Lopaschuk GD, Keehan KH, Taegtmeier H, Des Rosiers C, William (Bill) C Stanley (1957-2013). *Am J Physiol Heart Circ Physiol* 2014;306:H161-2.
285. Mori J, Patel VB, Abo Alrob O, Basu R, Altamimi T, Desaulniers J, Wagg CS, Kassiri Z, Lopaschuk GD, Oudit GY. Angiotensin 1-7 ameliorates diabetic cardiomyopathy and diastolic dysfunction in db/db mice by reducing lipotoxicity and inflammation. *Circ Heart Fail* 2014;7:327-339.
286. Fillmore N, Mori J, Lopaschuk GD. Mitochondrial fatty acid oxidation alterations in heart failure, ischemic heart disease, and diabetic cardiomyopathy. *Br J Pharmacol* 2014;8:2080-2090.
287. Fillmore N and Lopaschuk GD. Malonyl CoA: A promising target for the treatment of cardiac disease. *IUBMB Life*. 2014; Mar 3. doi: 10.1002/iub.1253. [Epub ahead of print] PubMed PMID: 24591219.
288. Mori J, Patel VB, Ramprasath T, Alrob OA, Desaulniers J, Scholey JW, Lopaschuk GD, Oudit GY. Angiotensin 1-7 mediates renoprotection against diabetic nephropathy by reducing oxidative stress, inflammation and lipotoxicity. *Am J Physiol Renal Physiol* 2014;306:F812-F821.
289. Lee CT, Ussher JR, Mohammad A, Lam A, Lopaschuk GD. 5'-AMP-activated protein kinase increases glucose uptake independent of GLUT4 translocation in cardiac myocytes. *Can J Physiol Pharmacol* 2014;92:307-314 .

290. Ussher JR, Keung W, Fillmore N, Koves TR, Mori J, Zhang L, Lopaschuk DG, Ilkayeva OR, Wagg CS, Jaswal JS, Muoio DM, Lopaschuk GD. Treatment with the 3-Ketoacyl-CoA thiolase inhibitor trimetazidine does not exacerbate whole-body insulin resistance in obese mice. *J Pharmacol Exp Ther* 2014;349(3):487-96.
291. Davidson SM, Lopaschuk GD, Spedding M, Beart PM. Mitochondrial pharmacology: energy, injury and beyond. *Br J Pharmacol* 2014;171(8):1795-7.
292. Samokhvalov V, Alsaleh N, El-Sikhry HE, Jamieson KL, Chen CB, Lopaschuk DG, Carter C, Light PE, Manne R, Falck JR, Seubert JM. Epoxyeicosatrienoic acids protect cardiac cells during starvation by modulating an autophagic response. *Cell Death Dis* 2014;4:e885.
293. Gao S, McMillan RP, Jacas J, Zhu Q, Li X, Kumar GK, Casals N, Hegardt FG, Robbins PD, Lopaschuk GD, Hulver MW, Butler AA. Regulation of substrate oxidation preferences in muscle by the peptide hormone a dropin. *Diabetes* 2014;63:3242-3252.
294. Heusch G, Libby P, Gersh B, Yellon D, Böhm M, Lopaschuk G, Opie L. Cardiovascular remodelling in coronary artery disease and heart failure. *Lancet* 2014;383:1933-1943.
295. Abo Alrob O and Lopaschuk GD. Role of CoA and acetyl-CoA in regulating cardiac fatty acid and glucose oxidation. *Biochem Soc Trans* 2014;42(4):1043-51.
296. Ussher JR, Fillmore N, Keung W, Mori J, Beker DL, Wagg CS, Jaswal JS, Lopaschuk GD. Trimetazidine therapy prevents obesity-induced cardiomyopathy in mice. *Can J Cardiol* 2014;30(8):940-4.
297. Ezekowitz JA, Becher H, Belenkie I, Clark AM, Duff HJ, Friedrich MG, Haykowsky MJ, Howlett JG, Kassiri Z, Kaul P, Kim DH, Knudtson ML, Light PE, Lopaschuk GD, McAlister FA, Noga ML, Oudit GY, Paterson DI, Quan H, Schulz R, Thompson RB, Weeks SG, Anderson TJ, Dyck JR. The Alberta Heart Failure Etiology and Analysis Research Team (HEART) study. *BMC Cardiovasc Disord* 2014;14(1):91.
298. Alrob OA, Sankaralingam S, Ma C, Wagg CS, Fillmore N, Jaswal JS, Sack MN, Lehner R, Gupta MP, Michelakis ED, Padwal RS, Johnstone DE, Sharma AM, Lopaschuk GD. Obesity-induced lysine acetylation increases cardiac fatty acid oxidation and impairs insulin signalling. *Cardiovasc Res* 2014;103(4):485-97.
299. Fillmore N, Lopaschuk GD. The link between pediatric heart failure and mitochondrial lipids. *J. Mol. Cell Cardiol* 2014;76C:71-72.
300. Aksentijević D, McAndrew DJ, Karlstädt A, Zervou S, Sebag-Montefiore L, Cross, R, Douglas G, Regitz-Zagrosek V, Lopaschuk GD, Neubauer S, Lygate CA. Cardiac dysfunction and peri-weaning mortality in malonyl-coenzyme A decarboxylase (MCD) knockout mice as a consequence of restricting substrate plasticity. *J Mol Cell Cardiol* 2014;75:76-87.
301. Putko BN, Wang Z, Lo J, Anderson T, Becher H, Dyck JR, Kassiri Z, Oudit GY; Alberta HEART Investigators. Circulating levels of tumor necrosis factor-alpha receptor 2 are increased in heart failure with preserved ejection fraction relative to heart failure with reduced ejection fraction: evidence for a divergence in pathophysiology. *PLoS One* 2014;9(6):e99495.
302. Wu R, Chang HC, Khechaduri A, Chawla K, Tran M, Chai X, Wagg C, Ghanefar M,

- Jiang X, Bayeva M, Gonzalez F, Lopaschuk GD, Ardehali, H. Cardiac-specific ablation of ARNT leads to lipotoxicity and cardiomyopathy. *J Clin Invest* 2014;3;124(11):4795-806.
303. Zhang L, Yu X, Cheyesh A, Rebeyka IM, Granoski D, Lopaschuk, G.D, Li J. Plasma fatty acid levels in children during extracorporeal membrane oxygenation support - a pilot study. *J Extra Corpor Technol* 2014;45(4):242-7.
304. Wu R, Chang HC, Khechaduri A, Chawla K, Tran M, Chai X, Wagg C, Ghanefar M, Jiang X, Bayeva M, Gonzalez F, Lopaschuk GD, Ardehali H. Cardiac-specific ablation of ARNT leads to lipotoxicity and cardiomyopathy. *J Clin Invest* 2014;124(11):4795-806.
305. Sankaralingam S, Alrob OA, Zhang L, Jaswal JS, Wagg CS, Fukushima A, Padwal RS, Johnstone DE, Sharma AM, Lopaschuk GD. Lowering body weight in obese mice with diastolic heart failure improves cardiac insulin sensitivity and function: Implications for the obesity paradox. *Diabetes* 2015;64:1643-1657.
306. Lopaschuk GD, Ussher JR. Targeting microRNAs to limit myocardial lipid accumulation. *Circ Res* 2015;116(2):229-31.
307. Fillmore N, Huqi A, Jaswal JS, Mori J, Paulin R, Haromy A, Onay-Besikci A, Ionescu L, Thébaud B, Michelakis E, Lopaschuk GD. Effect of fatty acids on human bone marrow mesenchymal stem cell energy metabolism and survival. *PLoS One* 2015;10(3):e0120257.
308. Mohamed IA, Gadeau AP, Fliegel L, Lopaschuk GD, Mlih M, Abdulrahman N, Fillmore N, Mraiche F. Na⁺/H⁺ exchanger isoform 1-induced osteopontin expression facilitates cardiomyocyte hypertrophy. *PLoS One*. 2015;10(4):e0123318.
309. Gao S, McMillan RP, Zhu Q, Lopaschuk GD, Hulver MW, Butler AA. Therapeutic effects of adropin on glucose tolerance and substrate utilization in diet-induced obese mice with insulin resistance. *Mol Metab* 2015;4(4):310-24 .
310. Fillmore N, Keung W, Kelly SE, Proctor SD, Lopaschuk GD, Ussher JR. Accumulation of ceramide in slow-twitch muscle contributes to the development of insulin resistance in the obese JCR:LA-cp rat. *Exp. Physiol* 2015;100(6):730-741.
311. Opie LH, Lopaschuk GD. What is good for the circulation also lessens cancer risk. *Eur Heart J* 2015;36(19):1157-1162.
312. Sankaralingam S, Lopaschuk, GD. Cardiac energy metabolic alterations in pressure overload-induced left and right heart failure. *Pulm Circ* 2015;5(1):15-28.
313. Lam VH, Zhang L, Huqi A, Fukushima A, Tanner BA, Onay-Besikci A, Keung W, Kantor PF, Jaswal JS, Rebeyka IM, Lopaschuk GD. Activating PPAR α prevents post-ischemic contractile dysfunction in hypertrophied neonatal hearts. *Circ Res* 2015;117:41051.
314. Patel VB, Mori J, McLean BA, Basu R, Das SK, Ramprasath T, Parajuli N, Penninger JM, Grant MB, Lopaschuk GD, Oudit GY. ACE2 deficiency worsens epicardial adipose tissue inflammation and cardiac dysfunction in response to diet-induced obesity. *Diabetes* 2015 Jul 29. pii: db150399. [Epub ahead of print] PubMed PMID: 26224885.
315. Fukushima A, Milner K, Gupta A, Lopaschuk GD. Myocardial energy substrate metabolism in heart failure : from pathways to therapeutic targets. *Curr Pharm Des* 2015 Jul 10. [Epub ahead of print]

PubMed PMID: 26166604.

316. Masoud WG, Abo Al-Rob O, Yang Y, Lopaschuk GD, Clanachan AS. Tolerance to ischaemic injury in remodelled mouse hearts: less ischaemic glycogenolysis and preserved metabolic efficiency. *Cardiovasc Res.* 2015 Sep 1;107(4):499-508
317. Azam MA, Wagg CS, Massé S, Farid T, Lai PF, Kusha M, Asta J, Jaimes R 3rd, Kuzmiak-Glancy S, Kay MW, Lopaschuk GD, Nanthakumar K. Feeding the fibrillating heart: Dichloroacetate improves cardiac contractile dysfunction following VF. *Am J Physiol Heart Circ Physiol* 2015 Nov;309(9):H1543-53
318. Patel VB, Mori J, McLean BA, Basu R, Das SK, Ramprasath T, Parajuli N, Penninger JM, Grant MB, Lopaschuk GD, Oudit GY. ACE2 Deficiency Worsens Epicardial Adipose Tissue Inflammation and Cardiac Dysfunction in Response to Diet-Induced Obesity. *Diabetes* 2016 Jan;65(1):85-95
319. Akhnokh MK, Yang FH, Samokhvalov V, Jamieson KL, Cho WJ, Wagg C, Takawale A, Wang X, Lopaschuk GD, Hammock BD, Kassiri Z, Seubert J. (2016). Inhibition of soluble epoxide hydrolase limits mitochondrial damage and preserves function following ischemic injury. *Front Pharmacol.* 7(133): 1-7.
320. Groenendyk J, Lee D, Jung J, Dyck JR, Lopaschuk GD, Agellon LB, Michalak M. (2016). Inhibition of the unfolded protein response mechanism prevents cardiac fibrosis. *PLoS One.* 11(7): e0159682.
321. Lopaschuk GD. (2016). Fatty acid oxidation and its relation with insulin resistance and associated disorders. *Annals of Nutrition and Metabolism.* 68((suppl 3)): 15-20.
322. Carvalhoi E, Lopaschuk GD, Borsheim E, Burgeiro A. (2016). Reply to Katlander, Ozbek and Keser. *Am J Physiol: Endocrinol Metab.* 310(10): E863.
323. Ussher JR, Fillmore N, Keung W, Zhang L, Mori J, Sidhu VK, Fukushima A, Gopal K, Lopaschuk DG, Wagg CS, Jaswal JS, Dyck JR, Lopaschuk GD. (2016). Genetic and pharmacological inhibition of malonyl CoA decarboxylase does not exacerbate age-related insulin resistance in mice. *Diabetes.* 65(7): 1883-1893.
324. Taegtmeier H, Young ME, Lopaschuk GD, Stanley WC, Neubauer S, Gropler R, Malloy C, Des Rosiers C, plus 19 authors American Heart Statement: Assessing cardiac metabolism. *Circ Res* A scientific statement from the American Heart Association. *Circulation Research.* 118(10): 1659-1701.
325. Lopaschuk GD, Verma S. (2016). Empagliflozin's fuel hypothesis: Not so soon. *Cell Metabolism.* 9(24): 200-202.
326. Lopatin YM, Rosano GM, Fragasso G, Lopaschuk GD, Seferovic PM, Gowdak LH, Vineranu D, Hamid MA, Jourdain P, Ponikowski P. (2016). Rationale and benefits of trimetazidine by acting on cardiac
327. Lopaschuk GD. (2016). Preface to the BBA special issue "heart lipid metabolism". *Biochim Biophys Acta.* 1860(10): 1423-1424.
328. Fukushima A, Alrob OA, Zhang L, Wagg CS, Altamimi T, Rawat S, Rebeyka IM, Kantor PF, Lopaschuk GD. (2016). Acetylation and succinylation contribute to maturational alterations in energy metabolism in the newborn heart. *Am J Physiol: Heart and Circulatory Physiology.* 311(2): H347-H363.
329. Fukushima A, Lopaschuk GD. (2016). Acetylation control of cardiac fatty acid β -oxidation and energy

metabolism in obesity, diabetes and heart failure. *Biochim Biophys Acta*. S0925-4439(16): 30188-0.

330. Lopaschuk GD, Ussher JR. (2016). Evolving concepts of myocardial energy metabolism: More than fats and carbohydrates. *Circulation Research*. 119(8): 1-5.
331. Fukushima A, Lopaschuk GD.(2016). Cardiac fatty acid oxidation in heart failure associated with obesity and diabetes. *Biochim Biophys Acta*. 1860(10): 1525-34.

BOOK CHAPTERS AND INVITED PAPERS:

1. Lopaschuk, G.D. Glucose oxidation in hearts from diabetic rats perfused following a period of transient global ischemia. In: *Diabetic Heart*, eds: Nagano M and Dhalla NS, Raven Press Ltd p. 451-464 (1991).
2. Lopaschuk, G.D., Broderick T., and Saddik, M. In: Carnitine and carnitine acyltransferase inhibitors stimulate glucose oxidation in intact hearts perfused with high concentration of acids. In: *Current concepts in carnitine research*. ed. Carter AL, CRC Press, 231-243 (1992).
3. Lopaschuk, G.D. Effects of carnitine and carnitine acyltransferase inhibition on energy substrate utilization in the intact heart. *L-carnitine and its role in medicine* from function to therapy, ed. R. Ferrari, Academic Press. 22:403-410 (1991).
4. Lopaschuk, G.D. and Saddik, M. The relative contribution of glucose and fatty acids to ATP production in hearts reperfused following ischemia. *Mol. Cell. Biochem.* 116:111-116 (1992).
5. Lopaschuk, G.D., Collins-Nakai, R.L., and Itoi, T. Developmental changes in energy substrate use by the heart. *Cardiovasc. Res.* 26:1172-1180(1992).
6. Lopaschuk, G.D., Broderick T., and Gamble, J. Pharmacological control of glucose and fatty acid metabolism in the heart. *Cardiologia* 37(suppl):29-33 (1992).
7. Schönekeess, B.O., and Lopaschuk, G.D. The effects of carnitine on myocardial carbohydrate metabolism. *The Carnitine System and the Heart*. Ed: J.W. de Jung, R. Ferrari pp. 39-52 (1995).
8. Clanachan, A.S., and Lopaschuk, G.D. Alterations in energy substrate metabolism during oxidative stress. *Purines and Myocardial Protection*. Abd-Alfattah & Wechsler Eds. Kluwer Academic Publishers, pp. 105-115 (1996)
9. Lopaschuk, G.D. How can fatty acid and carbohydrate metabolism be manipulated? Dialogues in *Cardiovascular Res.* 1:93-98 (1996)
10. Barr, R.L., Lopaschuk, G.D. The fatty acid perfused isolated working heart “*Measurement of Cardiovascular Function*”, Ed. J.H. McNeill, CRC Press pp. 1-17 (1997).
11. Barr, R.L., Lopaschuk, G.D. Direct measurement of energy metabolism in the isolated working rat heart. *J. Pharmacol. Toxicol. Methods.* 38:11-17(1997).
12. Lopaschuk, G.D., Barr, R. Measurements of fatty acid and carbohydrate metabolism in the isolated working rat heart. *Mol. Cell. Biochem.* 172:137-147(1997).
13. Lopaschuk, G.D., Stanley, W.C. Manipulations of energy metabolism in the heart. *Sci. & Med.* 4:42-51 (1997)
14. Barr, R.L., Lopaschuk, G.D. Measurements of energy metabolism in the isolated heart. “*Measurement of Cardiovascular Function*”, Ed. J.H. McNeill, CRC Press 19-40 (1997).
15. Lopaschuk, G.D. Carnitine and myocardial glucose metabolism. *Carnitine Today* 71-93 (1997)
16. Lopaschuk, G.D. Alterations in fatty acid oxidation during reperfusion of the heart after myocardial ischemia. *Am. J. Cardiol.* 80:11A-16A (1997)

17. Lopaschuk, G.D., Barr, R. Measurements of fatty acid and carbohydrate metabolism in the isolated working rat heart. *Mol. Cell. Biochem.* 172:137-147 (1997)
18. Lopaschuk, G.D., Stanley, W.C. Manipulation of energy metabolism in the heart. *Science and Medicine.* 4:2-51 (1997)
19. Belke, D.D., Lopaschuk, G.D. Fatty acid metabolism in the reperfused ischemic heart. *Advances in Lipobiology*, JAI Press Inc. 2:29-46 (1997)
20. Lopaschuk, G.D. Advantages and limitations of experimental techniques used to measure cardiac energy metabolism. *J. Nucl. Cardiol.* 4:316-328 (1997).
21. Lopaschuk, G.D., Clanachan, A.S. The source and fate of protons in the reperfused ischemic heart. *"The Ischemic Heart"* Kluwer Academic Publishers. S. Mochiuzuki, N. Takeda, M. Nagano, N. Dhalla Eds.199-213 (1998)
22. Lopaschuk, G.D. Treating ischemic heart disease by pharmacologically improving cardiac energy metabolism. *"Presse Med."* 27:2100-2104(1998) French.
23. Lopaschuk, G.D. Fatty acid and glucose metabolism: A target for intervention. "Metabolic Management of Ischemic Heart Disease". *Am. J. Cardiol.* SP Science Press Ltd. 44-54 (1998)
24. Makinde, A.O., Kantor, P.F., Lopaschuk, G.D. Maturation of fatty acid and carbohydrate metabolism in the newborn heart. *Mol. Cell. Biochem.* 188:49-56 (1998).
25. Stanley W.C., Lopaschuk, G.D., Kivilo, K.M. Alteration in myocardial energy metabolism in streptozotocin diabetes. *Experimental Models of Diabetes.* CRC Press (1999).
26. Kantor, P.F., Dyck, J.R.B., Lopaschuk, G.D. Fatty acid oxidation in the reperfused ischemic heart. *Am. J. Med. Sci.* 318:3-14 (1999)
27. Lopaschuk, G.D. Optimizing cardiac energy metabolism: a new approach to treating ischaemic heart disease. *Eur. Heart J. Suppl.* 1:32-39 (1999)
28. Lopaschuk, G.D. Metabolic agents: a new approach to the management of coronary heart disease. *Heart and Metabolism* 5:1-2 (1999)
29. Lopaschuk, G.D. Metabolic agents: a new approach in treating ischemic heart disease. *Heart and Metabolism* 4:5-10 (1999)
30. Lopaschuk, G.D. Métabolisme énergétique du coeur diabétique: Effets de l'ischémie et de l'hypertrophie. In *Coeur et Diabète*. Prise en charge et suivi des patients diabétiques. Ed. Frison-Roche. pp. 31-50 (1999).
31. Kantor, P.F., Dyck, J.R., Lopaschuk, G.D. Fatty acid oxidation in the reperfused ischemic heart. *Am. J. Med. Sci.* 318:3-14 (1999).
32. Lopaschuk, G.D. Regulation of Carbohydrate metabolism in ischemia and reperfusion. *Am. Heart J.* 139:S115-S119 (1999).
33. Allard, M.F., Stanley, W.A., Lopaschuk, G.D. Metabolic effects of glucose-insulin-potassium on the

- heart. *Heart and Metabolism* 7:2-9 (2000).
34. Lopaschuk, G.D. Glycolysis Regulation. *Encyclopedia of Sciences* 1-11 (2000).
 35. Kantor, F.P., Lopaschuk, G.L., Opie, L.H. Myocardial Energy Metabolism. *Heart Physiology and Pathophysiology*. 534-569 (2000)
 36. Lopaschuk, G.D. Myocardial metabolism and function in diabetes. *Heart and Metabolism*, 11:3-7 (2001).
 37. Marber, M., Lopaschuk, G.D. Metabolic and ion flux interventions for acute infarction? *Heart and Metabolism*, 12:1-2 (2001)
 38. Lopaschuk, Gary D. Optimizing cardiac energy metabolism: How can fatty acid and carbohydrate metabolism be manipulated? *Coronary Artery Disease*, 12:S8-S11 (2001).
 39. Lopaschuk, G.D. Myocardial metabolism and function in diabetes. *Heart and Metabolism* 11:3-7 (2001).
 40. Lopaschuk, G.D. Trimetazidine in AMI. *Eur. Heart J.* 22:977-978 (2001).
 41. Lopaschuk, G.D. Regulation of carbohydrate metabolism in ischemia and reperfusion. *Am. Heart. J.* 139:S115-119 (2001).
 42. Lopaschuk, G.D. Malonyl CoA control of fatty acid oxidation in the diabetic rat heart. *Diabetes and Cardiovascular Disease*. 498:155-165 (2001).
 43. Lopaschuk, G.D. Metabolic abnormalities in the diabetic heart. *Heart Failure Reviews* 7:149-159 (2002).
 44. Sambandam N., Lopaschuk, G.D., Brownsey, R.W., Allard, M.F. Energy metabolism in the hypertrophied heart. *Heart Fail. Rev.* 7:161-173 (2002).
 45. Lopaschuk, G.D. Metabolic Modulation in the management of coronary artery disease. *Cardiology at the limits*.17-34 (2002).
 46. Lopaschuk, G.D., Opie, L.H. Introduction to JMCC Symposium on myocardial energy metabolism in health and disease. *J. Mol. Cell. Cardiol.* 34:1075-1076 (2002).
 47. Lopaschuk, G. Mode of action of trimetazidine and other new metabolic agents in the treatment of ischemic heart disease. *Proceedings: Low Output Syndrome Revisited*. 77-81 (2002).
 48. Lopaschuk, G. Metabolic modulation in the management of coronary artery disease. *Cardiology at the Limits V.* 17-30 (2002).
 49. Lopaschuk, G.D. Pharmacological rationale for trimetazidine in the treatment of ischemic heart disease. *Am. J. Cardiov. Drugs* 3 (Suppl. 1):21-26, 2003.
 50. Lopaschuk G.D. Metabolic Interventions. *Acute Coronary Syndromes*, Saunders. 359-367 (2003).
 51. Dyck, J.R.B., Lopaschuk, G.D. Malonyl CoA control of fatty acid oxidation in the ischemic heart. *J. Mol. Cell. Cardiol.* 34:1099 (2002).
 52. Sambandam, N., Lopaschuk, G.D., Brownsey, R.W., Allard, M.E. Energy metabolism in the hypertrophied heart. *Heart Fail. Rev.* 7:161-173 (2002).

53. Hopkins, T.A., Dyck, J.R.B, Lopaschuk, G.D. AMP-activated protein kinase regulation of fatty acid oxidation in the ischaemic heart. *Biochem. Soc. Trans.* 31:207-212 (2003).
54. Sambandam, N., Lopaschuk, G.D. AMP-activated protein kinase control of fatty acid and glucose metabolism in the ischemic heart. *Prog. Lipid Res.* 42:238-256 (2003)
55. Lopaschuk, G.D., Marzilli, M. Mode of action of trimetazidine and other new metabolic agents in the treatment of ischemic heart disease. *Seminars in Cardiothoracic and Vascular Anesthesia.* 7:91-96 (2003).
56. Lopaschuk, G.D. Manipulation of free fatty acid oxidation in ischemic heart disease. *Medicographia* 25:334-340 (2003).
57. Lopaschuk, G.D. Hypertrophic Cardiomyopathies: role of genetic mutations in proteins involved in sarcomere function and energy metabolism in the pathogenesis of this disorder. *Heart Metab.* 21:3-4 (2003).
58. Opie, L.H., Lopaschuk, G.D. Fuels: Aerobic and Anaerobic Metabolism. *Heart Physiology. From Cell to Circulation.* Lipincott Williams and Wilkins 306-354 (2003)
59. Lopaschuk, G., Onay-Besikci A. Regulation of fatty acid oxidation by malonyl CoA in cardiac muscle. *Lipobiology* 33:223-24 (2004).
60. Lopaschuk G.D. Targets for modulation of fatty acid oxidation in the heart. *Current Opinion in Investigational Drugs* 5:290-294 (2004).
61. Fukao, T., Lopaschuk, G.D., Mitchell, G.A. Pathways and control of ketone body metabolism: on the fringe of lipid biochemistry. *Prostaglandins Leuk. Essent. Fatty Acids* 70:243-251 (2004).
62. Lopaschuk, G.D. The role of fatty acid oxidation in cardiac ischemia. *Adv. Studies Med.* 4:S803-S807 (2004).
63. Lopaschuk, G. Glutamate transport in the heart: lessons learned from the brain. *J. Mol. Cell Cardiol.* 37:1:5-6 (2004).
64. Noga, A.A., Dyck, J.R.B., Lopaschuk, G.D. Alterations in energy metabolism in acute coronary syndromes. *Heart Metab.* 23:5-12 (2004).
65. Armstrong, P.W, Ezekowitz, C., Michelakis, E., Anderson, T., Archer, S., Ghali, W., Hayward, R., Jensen, L. Lopaschuk, G.D., Sheldon, R. Innovative strategic Canadian research training from Tomorrow's Research Cardiovascular Health Care Professionals (TORCH). *Clin. Invest. Med.* 27:33-341 (2004).
66. Folmes, C.D.L., Clanachan, A.S., Lopaschuk, G.D. Fatty acid oxidation inhibitors in the management of chronic complications of atherosclerosis. *Current Atherosclerosis Reports* 7:63-70 (2005).
67. Lopaschuk, G.D. Optimizing cardiac fatty acid and glucose metabolism as an approach to treating heart failure. *Seminars in Cardiothoracic and Vascular Anesthesia.* 3:28-230 (2006).
68. Lopaschuk, G.D. Cardiac energy metabolism alterations in angiotensin II induced hypertrophy. *J. Mol. Cell. Cardiol.* 41:418-420 (2006).

69. Ussher, J.R., Lopaschuk, G.D. Clinical implications of energetic problems in cardiovascular diseases. *Heart and Metabolism*. Metabolic Profile in Heart Disease. 32:9-17 (2006).
70. Lopaschuk, G.D., Stanley, W. Malonyl-CoA decarboxylase inhibition as a novel approach to treat ischemic heart disease. *Cardiovasc. Drugs. Ther.* 20:433-439 (2006).
71. Lopaschuk G.D. Optimizing cardiac fatty acid and glucose metabolism as an approach to treating heart failure. *Semin. Cardiothorac. Vasc. Anesth.* 10:228-230 (2006)
72. Folmes, C., Lopaschuk, G.D. Role of malonyl CoA in heart disease and the hypothalamic control of obesity. *Cardiovascular Research*. Spotlight issue in Nutrition and Metabolism. 73:278-287 (2007).
73. Lam, A., Lopaschuk, G. Anti-anginal effects of partial fatty acid oxidation inhibitors. *Curr Opin Pharmacol.* 7:179-82 (2007).
74. Lopaschuk, G.D. Cardiac metabolism I. *Dialogues in Cardiovascular Medicine.* 3:278-87 (2007).
75. Noga, A.A., Soltys, C.M., Barr, A.J., Kovacic, S., Lopaschuk, G.D., Dyck, J.R. Expression of an active LKB1 complex in cardiac myocytes results in decreased protein synthesis associated with phenylephrine-induced hypertrophy. *Am. J. Physiol.* 292:H1460-H1469 (2007).
76. Taha, M., Lopaschuk, G.D. Alterations in energy metabolism in cardiomyopathies. *Ann. Med.*39: 594-607 (2007).
77. Wang, W., Lopaschuk, G.D. Metabolic therapy for the treatment of ischemic heart disease: reality and expectations. *Expert Review of Cardiovascular Therapy* 21:3974-3985 (2007).
78. Jaswal J.S., Cadete V.J.J., Lopaschuk G.D. Optimizing cardiac energy substrate metabolism: a novel therapeutic intervention for ischemic heart disease. *Heart Metab.* 38: 5-14 (2008).
79. Lopaschuk, G.D. AMP-activated protein kinase control of energy metabolism in the ischemic heart. *Int J Obes (Lond)* 4:S29-S35 (2008).
80. Lopaschuk, G.D. Editorial. Diabetes and cardiovascular disease. *Heart Metab.* 45 (2009).
81. Jaswal, J.S., Ussher, J.R., Lopaschuk, G.D. Myocardial fatty acid utilization as determinant of cardiac efficiency and function. *Clin. Lipid.* 4:379-389 (2009).
82. Lopaschuk, G.D., Jaswal, J.S. Energy metabolic phenotype of the cardiomyocyte during development, differentiation, and post-natal maturation. *J. Cardio. Pharmacol* 56:130-140 (2010).
83. Lopaschuk, G.D. Editorial. Obesity and heart disease. *Heart Metab.* 48 (2010).
84. Jaswal, J.S., Keung, W., Wang, W., Ussher, J.R. and Lopaschuk, G.D. Molecular changes in fatty acid oxidation in the failing heart. In: *Molecular defects in cardiovascular disease*. eds: Dhalla, N., Nagano, M. and Ostadal, B. Springer p.153-176 (2011).
85. Jaswal, J.S. and Lopaschuk, G.D. Cardiac energy metabolism in ischemia and ischemic cardiomyopathy. In: *Moving forward on the management of ischemic cardiomyopathy*. eds: Ferrari, R. and Ponikowski, P. Springer p.55-72 (2011).

86. Nagoshi, T., Yoshimura, M., Rosano, G.M., Lopaschuk, G.D., Mochizuki, S. Optimization of cardiac metabolism in heart failure. *Curr. Pharm. Des.* 17:3846-53 (2011)
87. Fillmore, N., Abo Alrob, O. and Lopaschuk, G.D. Fatty acid beta-oxidation. *AOCS Lipid Library*. [Epub ahead of print] (2011).
88. Lopaschuk, G.D. Editorial. Dictionary of Cardiac Metabolism, *Heart Metab.* Servier (2012).
89. Lopaschuk, G.D. Cardiac energy metabolism in heart failure associated with obesity and diabetes. In: *Cardiac Energy Metabolism in Health and Disease*. Editors: Lopaschuk G., Dhalla N.S.; Springer, New York p. 89-102 (2014).
90. Altamimi R., Lopaschuk, G.D. Role of carnitine in modulation of muscle energy metabolism and insulin resistance. In: *Carnitine Metabolism and Human Nutrition*. Editors: Wall B.T., Porter C. CRC Press, Boca Raton, Florida (in press).

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