

TODD E. GILLIS**CURRENT ADDRESS**

Department of Integrative Biology, University of Guelph
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EDUCATION

Ph.D. Department of Biological Sciences, Simon Fraser University.
Thesis Title: Functional characterization of salmonid cardiac troponin C.
Thesis Advisor: Dr. Glen F. Tibbits.
Year granted: 2003

M.Sc. Department of Zoology, University of Guelph.
Thesis Title: Influence of sub-zero temperatures on the mitochondrial membrane composition of marine bivalve molluscs.
Thesis Advisor: Dr. James S. Ballantyne.
Year granted: 1996

B.Sc. Honors (Marine Biology). University of Guelph.
Year granted: 1994

ACADEMIC POSITIONS**Visiting Professor**

Department of Zoology, University of British Columbia
Sept 2013-July 2014

Associate Professor with tenure

Department of Integrative Biology, University of Guelph
July 2011-present

Assistant Professor

Department of Integrative Biology, University of Guelph
July 2005-2011

Senior Research Fellow

Department of Bioengineering, University of Washington.
Research focus: Effects of PKA phosphorylation on cardiac contractility.
2004-2005

NSERC Post Doctoral Fellow

Department of Bioengineering, University of Washington.
Research focus: Influence of thin regulation on cardiac function.
Supervisor: Dr. Mike Regnier
2003-2004

Visiting Scientist

McMurdo Research Station, Antarctica.
Research focus: Physiological and molecular adaptations to extreme low temperatures.
2001

HONORS

- **Simon Fraser University Dean of Graduate Studies Convocation Medal in the Faculty of Science.** 2003
- **Scholander Award for Research Excellence by a Young Investigator.** American Physiological Society, 2002
- **William S. Hoar Award for Best Student Paper.** Canadian Society of Zoologists. 2002

FELLOWSHIPS

- **NSERC Post-Doctoral Fellowship,** (\$84,000) 2002-2004
- **US Polar Programs (NSF) Biology Training Course in Antarctica,** (~\$30,000) 2001
- **Garfield Weston Graduate Fellowship in Marine Sciences,** (\$40,000) 2000 - 2001
- **Heart and Stroke Foundation of Canada Doctoral Fellowship,** (\$80,000) 1998 - 2001
- **Simon Fraser University Graduate Fellowship,** 1998 - 2000 (declined)

RESEARCH SUPPORT*Funded*

total = \$3,831,199

The development of plasma biomarkers to detect cardiac stress for aquaculture and native salmonid populations (\$25,000)

NSERC Engage, 2015

Effects of diluted bitumen exposure during early life stages on the aerobic capacity and cardiac fitness of Pacific sockeye salmon (\$432,500) 2014-2017

Fisheries and Oceans Canada National Contaminants Advisory Group

Co-Applicants: Todd Gillis (PI), Tony Farrell (UBC), Chris Kennedy (SFU), Sarah Alderman (Guelph)

Respirometry and environmental control in micro-aquatic systems, (\$81,292)

NSERC Research tools and infrastructure (RTI) grant, 2013

Co-Applicants: Patricia Wright (PI), Nick Bernier and Glen Van der Kraak. Respirometry equipment, and gas control systems for small aquatic animals

Adaptive strategies of the vertebrate heart (\$200,000)

NSERC Discovery Grant, 2012-2017

BioRad-ChemiDoc MP System, (\$83,000)

NSERC RTI grant, 2012

Co-Applicants: Todd Gillis (PI), Doug Fudge, Nick Bernier, and four others.

Equipment purchased, Bio-Rad ChemiDoc MP, Delta2D DIGE analysis software, three iMacs, BioRad proteomics equipment including turboblot, TC-25 cell counter and multiple protein gel systems.

Graduate Student Support Award, (\$30,000)

College of Biological Sciences, University of Guelph, 2011

Automated Fluorescence Spectrometer for Life Science Research, (\$88,676)

NSERC RTI, 2010

Co-Applicants: Rod Merrill (PI), Stephan Graether.

RESEARCH SUPPORT continued**The Biomechanics of Skin Blistering Diseases: A Cellular and Biophysical****Approach, (\$97,000)**

CIHR, Catalyst Grant Program, 2008

Co-applicant: Douglas Fudge.

Manufacture of high performance renewable fibres from hagfish slime thread proteins, (\$147,000)

Advanced Food and Materials Network STAR program, 2008

Co-applicants: Douglas Fudge (PI), Loon Tak (Food Sciences, Guelph), Laurent Kreplack (Physics, Dalhousie University)

Protein expression facility, (\$65,608)

NSERC RTI, 2007

Equipment purchased: Amersham AKTA FPLC, New Brunswick large platform shaker, chromatography refrigerator, and chromatography columns/material

Refrigerated Ultracentrifuge, (\$125,521)

NSERC RTI, 2007

Co-applicants: Glen VanderKraak (PI) Jim Ballantyne; Douglas Fudge, Joe Akerman, Nick Bernier, Gord McDonald, Pat Wright

Chiller Upgrade, Hagen Aqualab, University of Guelph, (\$120,701)

NSERC RTI 2007

Co-applicants: Jim Ballantyne (PI), Douglas Fudge, Nick Bernier

Tissue, Cell and Protein Dynamics Laboratory, (\$630,798)

Canadian Foundation for Innovation, Leader Opportunity Fund, 2006

Co-applicant: Douglas Fudge

Equipment purchased: Perkin Elmer LS 55 Luminescence Spectrometer, Applied Photophysics SX20 Stopped Flow Spectrofluorometer, Custom muscle mechanics system from Aurora Scientific, Ettan Gel Electrophoresis System, Ettan IPGphor III Isoelectric Focusing System, MTS NanoBionix Testing System, Zeiss AxioImager Z1 Epifluorescent Microscope, and Laminar flow biological safety cabinet.

Regulation of cardiac contractility in teleost fishes, (\$160,000)

NSERC Discovery Grant (2006-2011)

Biomaterials Testing Station, (\$52,804)

NSERC RTI, 2006

Co-applicant: Douglas Fudge (PI)

Equipment purchased: Zeiss stereomicroscope and an Instron benchtop Universal Testing Machine

University of Guelph start-up funds, (\$100,000)

2005

Cooperative Thin Filament Activation, (\$1,392,000)

US National Heart Lung and Blood Institute, 2005-2008

Co-applicants: Mike Regnier (PI), Don Martyn, Samantha Harris

SUPERVISORY EXPERIENCE***Research Associate***

Dr. Sarah Alderman

Project: **Effects of diluted bitumen exposure during early life stages on the aerobic capacity and cardiac fitness of Pacific sockeye salmon**
2014-

Post-Doctoral Fellows

Dr. Laura Dindia

Project: **The development of plasma biomarkers to detect cardiac stress for aquaculture and native salmonid populations**
2015-

Dr. Jordan Klaiman

Project: **Proteomic studies of high altitude adaptation in the Bar headed goose heart**
2013-2014

Current position: Heart and Stroke Foundation of Canada Post-Doctoral Fellow, University of Washington.

Dr. Atsuko Negishi

Project: **Developing methods to produce high performance renewable fibres from hagfish slime thread proteins**

Co-supervisor: Dr. Doug Fudge

2008-2011

Current position: Research Associate, University of Guelph

Graduate Students

Ms. Elizabeth Johnston, PhD Candidate

Thesis title. **Regulation of collagen deposition by trout cardiac fibroblasts**
2012-

Ms. Elizabeth Sears, MSc

Thesis title. **Evolution of cardiac troponin function in vertebrates**

2011-2014

Current position Research technician, Biodiversity institute of Ontario

Mr. Jordan Klaiman, PhD

Thesis title: **The effects of thermal acclimation on the functional properties of the trout myocardium**

2007- 2013

Current position: Heart and Stroke Foundation of Canada Post-Doctoral Fellow, Department of Bioengineering, University of Washington, Seattle WA.

Ms. Nicole Pinto, MSc

Thesis title. **Production of a bio-polymer from recombinant vimentin**

Co-supervisor: Dr. Doug Fudge

2010-2012

Current position: PhD Student, Western University

SUPERVISORY EXPERIENCE***Graduate Students continued***

Ms. Silvana Miller, MSc

Thesis title: **Effect of hypoxia exposure on the development of the cardio-respiratory system in rainbow trout**

2008-2010

Current position: Research Associate, Humber College

Ms. Kelly Kirkpatrick, MSc

Thesis Title: **Cloning and functional characterization of trout cardiac troponin I**

2006-2009

Current position: Lab Instructor, Bishop Straughn High School Toronto

Undergraduate Thesis Students Supervised

** = thesis published in peer reviewed journal

Mr. David Bakker, **Influence of cold acclimation on the metabolism of swimming zebrafish.** 2014-2015

Ms. Ariana Bonder, **Role of TGF- β in the regulation of trout cardiac fibroblasts** 2014-2015

Mr. Abiran Sritharan, **Influence of cold acclimation on the aerobic fitness of zebrafish.** 2013-2014

Ms. Amy Johnston, **Influence of cold acclimation on the histology and connective tissue content of the zebrafish heart. 2013

Current Position: PhD Student University of Alberta

Ms. Melanie Barry, **Influence of cold acclimation on the expression and phosphorylation of SERCA and phospholamban in the hearts of the burbot and crucean carp** 2012-2013

Ms. Elizabeth Johnston, **Influence of hypoxia exposure during embryonic development on the aerobic capacity of trout fry. 2011-2012

Current Position: PhD Student Guelph

Ms. Elizabeth Sears, **Influence of chronic hypoxia exposure on the expression of the cardiac contractile proteins during ontogeny of the rainbow trout.** 2011-2012

Current position Research technician Biodiversity institute of Ontario

Ms. Courtney Deck, **Influence of Cold Acclimation on TnI expression in the cardiac, slow skeletal, and fast skeletal muscle of the rainbow trout. 2011-2012

Current position: PhD Student U Ottawa.

Ms. Nicole Pinto, **Cloning of cardiac troponin T from the trout.** 2010-2011

Current position: PhD Student, Western University

Mr. Andrew Robertson, **Role of PKA phosphorylation in the regulation of cardiac troponin function 2009-2010

Current position: Medical Doctor, University of Toronto

Ms. Emily Van de Laar, **Application of DIGE to studying contractile protein phosphorylation.**

Completed MSc University of Guelph

Ms. Silvana Miller, **Influence of chronic hypoxia exposure on the metabolic rate of salmonid embryos during development. 2007-2008

Completed MSc University of Guelph

Ms. Caley Nadon, **Changes in the expression of troponin I mRNA during development.**
2007-2008

Current position: Dentist, Toronto

Ms. Brechan McGooney, **Changes in heart rate of rainbow trout embryos during hypoxia exposure.** 2006-2007

Current position: High school science teacher, Toronto

Ms. Heather Freamo, **Ca²⁺ sensitivity of actin myosin activity in the trout heart.**
2005

Completed MSc, University of Guelph

SUPERVISORY EXPERIENCE continued

Research Technicians

Mr. Alex Noble, University of Guelph, 2015-

Ms. Nicole Pinto, University of Guelph, 2013-2014

Dr. Ruby Sawhney, University of Guelph, 2005-2007

Ms. Collette Norby-Slycorte, University of Washington, 2003-2005

Graduate Student Supervisory Committees

Ms. Kelly Leveque, Integrative Biology (MSc)

Thesis topic: **Interacting effects of temperature and CO₂ on fitness of rainbow trout.**
2014-

Mr. Andy Turko, Integrative Biology (PhD)

Thesis topic: **Physiological adaptations of the mangrove killifish to aerial exposure.**
2013-

Mr. Andrew Foster, Human Health and Nutritional Sciences (PhD)

Thesis title: **Diaphragm dysfunction in mouse models of end stage heart failure**
2012-

Ms. Maria Anillo Molecular and Cellular Biology (MSc)

Thesis title: **Characterizing the function of cardiac actin mutants using the *in vitro* motility assay**
2012-

Ms. Marissa Dahari, Molecular and Cellular Biology (MSc)

Thesis Title: **Influence of actin mutations on protein-protein interaction within the cardiac myofilament**
2010-2012

Mr. David Irwin, Integrative Biology (MSc)

Thesis Title: **The Regulation and roles of locally-produced insulin-like growth factors on ovarian function in zebrafish (*Danio Rerio*)**
2009-2011

Ms. Melissa Chow, Molecular and Cellular Biology (MSc)

Thesis title: **Molecular stability of cardiac actin mutants**
2008-2010

Graduate Student Supervisory Committees continued

Mr. Noah Shapiro, Integrative Biology, Guelph (MSc)

Thesis title: Changes in fatty acid composition in cellular membranes of estivating lungfish

2008 - 2010

Mr. Ryan Demers, Molecular and Cellular Biology (MSc)

Thesis title: Characterization of the human cardiac actin variant M305L.

2007 - 2009

Ms. Fenghua Yang, Biomedical Sciences, OVC (PhD)

Thesis title: Role of cap-Z in the development of cardiac dysfunction

2007 - 2012

Ms. Anna Loncar, Molecular and Cellular Biology, Guelph (MSc)

Thesis title: Self assembly of actin and the influence of specific mutations

2007 - 2009

Ms. Christiana Simpson, Integrative Biology, Guelph (MSc)

Thesis title: Characterization of the expression and regulation of retinoic acid isoforms in various stages of zebrafish ovarian follicles

2006 - 2008

Ms. Ursula Polack, Molecular and Cellular Biology, Guelph (MSc)

Thesis title: Understanding the role of protein phosphorylation in starch synthesis

2006 – 2008

PEER REVIEWED PUBLICATIONS***UNDER REVIEW***

- 1) **Neurohormonal stimuli increases neural ventilatory drive triggering diaphragm atrophy and weakness in heart failure** Foster, A.J., Arkell, A.M., Platt, M.J., Huber, J.S., Romanova, N., Wright, D.C., Gillis, T.E., Murrant, C.L., Brunt, K.R. and Simpson, J.A.C.
Submitted: January 2015 to Journal of Clinical Investigation

In Preparation

- 3) Gillis, T.E., Regan, M.D., Cox, G.K., Hartner, T.S., Brauner, C.J., Richards, J.G., Farrell A.P. **Characterizing the influence of anoxia exposure on the isolated hagfish heart.**
Target Journal: Journal of Experimental Biology
- 2) Sears, E.J. and Gillis, T.E., **Functional evolution of troponin C in the vertebrate heart.**
Target Journal: Journal of Experimental Biology
- 1) Gillis, T.E., Klaiman, J.M., Foster A, and Simpson J.A.C. **Dissecting the role of the myofilament in diaphragm dysfunction during the development of heart failure in mice.** *Target Journal: Journal of Physiology*

Published Peer Reviewed Papers

**Undergraduate thesis research

- 30) Klaiman, J.M., Pyle, W.G. and Gillis, T.E. **Cold acclimation increases cardiac myofilament function and ventricular pressure generation in trout.** *Journal of Experimental Biology* 217, 4132-4140 (2014)

Published Peer Reviewed Papers continued

- 29) **Johnson, A., Turko, A.J., Klaiman, J.M., Johnston, E.F. and Gillis T. E. **Cold acclimation alters the connective tissue content of the zebrafish (*Danio rerio*) heart.** *Journal of Experimental Biology* 217, 1868-1875 (2014)
- 28) Pinto, N., Yang, F.C, Negishi A., Rheinstadter, M., Gillis, T.E.,[#] and Fudge, D.S.[#] **Self-assembly enhances the strength of fibres made from vimentin intermediate filament proteins.** [#]co-senior authors. *Biomacromolecules* 10: 574-581 (2014)
- 27) **Johnston, E.F., Alderman, S.L., and Gillis, T.E. **Chronic hypoxia exposure of trout embryos alters swimming performance and cardiac gene expression in larvae.** *Physiological and Biochemical Zoology* 86(5):567-75 (2013)
- 26) Smith, G.S.T., Samborska, B., Hawley, S. P., Klaiman, J. M., Gillis, T. E., Jones, N., Boggs, J. M., and Harauz G., **Nuclear-localized 21.5-kDa myelin basic protein promotes oligodendrocyte proliferation and neurite outgrowth in co-culture unlike the plasma membrane-associated 18.5-kDa isoform.** *Journal of Neural Biology* 91:349-62. (2013)
- 25) Negishi A., Armstrong, C., Kreplak, L., Rheinstadter, M., Lim, L, Gillis, T.E, and Fudge D.S. **The production of fibers and films from solubilized hagfish slime thread proteins.** *Biomacromolecules*, 13:3475-82 (2012)
- 24) Alderman, SL, Klaiman JM, **Deck, CA, and Gillis, T.E. **Effect of cold acclimation on troponin I isoform expression in striated muscle of rainbow trout.** *American Journal of Physiology*, 303, R168-176. (2012)
- 23) Klaiman, J, Fenna, A, Shiels, H.A. Macri, J. & Gillis, T.E. **Cardiac remodeling in fish: strategies to maintain heart function during temperature change.** *PLoS One*. (2011)
- 22) Miller, S.C., Gillis, T.E.[#], and Wright, P.A.[#] **The ontogeny of regulatory control of the rainbow trout (*Oncorhynchus mykiss*) heart and how this is influenced by chronic hypoxia exposure.** *Journal of Experimental Biology*, 214, 2065-2072 (2011).[#]co-senior authors
- 21) Kirkpatrick, K.P., **Robertson, A.S., Klaiman, J., & Gillis, T.E. **The influence of trout cardiac troponin I and PKA phosphorylation on the Ca²⁺ affinity of the cardiac troponin complex.** *Journal of Experimental Biology*. 214, 1981-1988 (2011)
- 20) Gillis, T.E., & Klaiman, J., **The influence of PKA phosphorylation on the Ca²⁺ activation of force generation by trout cardiac muscle.** *Journal of Experimental Biology*. 214, 1989-1996 (2011)
- 19) Shaffer, J.F, and Gillis, T.E. **Evolution of the regulatory control of vertebrate striated muscle: The roles of troponin I and myosin binding protein-C.** *Physiological Genomics*. 42:406-19 (2010)
- 18) **Miller S.C., **Reeb S.E., Wright P.A., and T.E. Gillis. **The influence of dissolved oxygen and water flow rate on growth and metabolic rate of rainbow trout embryos.** *Canadian Journal of Fisheries and Aquatic Sciences*. 85:2170-77 (2008)
- 17) Liang, B., Chung, F., Qu, Y., Gillis, T.E., Tikunova, S.B., Davis, J.P. and G.F. Tibbits. **The Familial Hypertrophic Cardiomyopathy related cardiac troponin C mutation, L29Q affects Ca²⁺ binding and myofilament contractility.** *Physiological Genomics*. 33:257-66. (2008)
- 16) Gillis, TE, Marshall C.R, and G. F. Tibbits. **Functional and Evolutionary Relationships of Troponin C.** *Physiological Genomics*. 19:16-27. (2007)

Published Peer Reviewed Papers continued

- 15) Gillis TE, Martyn DA, Rivera AJ, Regnier M. **Investigation of thin filament near-neighbor regulatory unit interactions during force development in skinned cardiac and skeletal muscle.** *Journal of Physiology.* 580:561-76. (2007).
- 14) Kreutziger KL, Gillis TE, Davis JP, Tikunova SB, and Regnier M. **Influence of enhanced troponin C Ca²⁺ binding affinity on cooperative thin filament activation in skeletal muscle.** *Journal of Physiology.* 583:337-50. (2007)
- 13) Moreno-Gonzalez A, Gillis T.E., Rivera AJ, Chase PB, Martyn DA, Regnier M. **Thin-filament regulation of force redevelopment kinetics in rabbit skeletal muscle fibres.** *Journal of Physiology.* 579:313-26. (2007)
- 12) Gillis, T.E., Liang, B., Chung, F., & Tibbits, G.F. **Increasing mammalian cardiomyocyte contractility with residues identified in trout troponin C.** *Physiological Genomics.* 22: 1-7. (2005)
- 11) Blumenschein, T.M.A., Gillis, T.E., Tibbits, G.F. & Sykes, B.D. **Effect of temperature on the structure of trout cardiac troponin C.** *Biochemistry.* 43:4955-4963. (2004)
- 10) Gillis, T.E., Blumenschein, T.M.A., Sykes, B.D. & Tibbits, G.F. **The effect of temperature and the F27W mutation on the Ca²⁺-activated structural transition of trout cardiac troponin C.** *Biochemistry.* 42:6418-6426. (2003)
- 9) Gillis, T.E., Moyes, C.D., & Tibbits, G.F. **Sequence mutations in teleost cardiac troponin C that are permissive of high site II Ca²⁺ affinity.** *American Journal of Physiology: Cell Physiology.* 284, C1176-1184. (2003)
- 8) Gillis, T.E., & Tibbits, G.F. **Beating the cold: The functional evolution of troponin C in teleost fish.** (Invited Review). *Comparative Biochemistry and Physiology Part A: Molecular and Integrative Physiology* 132, 763-772. (2002)
- 7) Gillis, T.E., Marshall, C.R., Xue, X.H., Borgford, T.J., & Tibbits, G.F. **Ca²⁺ binding to cardiac troponin C: effects of temperature and pH on mammalian and salmonid isoforms.** *American Journal of Physiology: Regulatory, Integrative, and Comparative Physiology.* 279, R1707-R1715. (2000)
- 6) Gillis, T.E., & Ballantyne, J.S. **Mitochondrial membrane composition of two Arctic marine bivalves mollusks, *Serripes groenlandicus* and *Mya truncata*.** *Lipids.* 34, 53-57. (1999)
- 5) Gillis, T.E., & Ballantyne, J.S. **Influences of sub-zero thermal acclimation on mitochondrial membrane composition of temperate marine bivalve mollusks.** *Lipids.* 34, 59-66. (1999)
- 4) Stuart, J.S., Gillis, T.E., & Ballantyne, J.S. **Compositional correlates of metabolic depression in mitochondrial membrane of an estivating snail, *Cepaea nemoralis*.** *American Journal of Physiology: Regulatory, Integrative, and Comparative Physiology.* 275, R1977-R1982. (1998)
- 3) Stuart, J.S., Gillis, T.E., & Ballantyne, J.S. **Remodeling of phospholipid fatty acids in mitochondrial membranes of an estivating snail.** *Lipids.* 33, 787-793. (1998)
- 2) Gillis, T.E., & Ballantyne, J.S. **Effects of starvation on plasma free amino acids and glucose concentrations in Lake Sturgeon, *Acipenser fulvescens*.** *Journal of Fish Biology.* 49, 1306-1316. (1996)
- 1) Leblanc, P.J., Gillis, T.E., Gerrits, M.F., & Ballantyne, J.S. **Metabolic organization of liver and somatic muscle of landlocked sea lamprey, *Petromyzon marinus*, during spawning migration.** *Canadian Journal of Zoology.* 73, 916-923 (1995)

NON-REFEREED CONTRIBUTIONS

Book Chapters

- 2) Gillis, T.E. **Evolution of the regulatory control of the vertebrate heart; the role of the contractile proteins.** Book chapter in *Ontogeny and Phylogeny of the vertebrate heart*. Springer. Tobias Wang Editor, 2012.
- 1) Gillis, T.E. **Cardiac Excitation–Contraction Coupling: Calcium and the Contractile Element.** *Encyclopedia of Fish Physiology*, Elsevier. Tony Farrell Editor, 2011.

Undergraduate papers published in “Studies by Undergraduate Researches at Guelph”.

This work was completed on the Marine Field Course taught by T.E. Gillis

- 6) Melanie Barry **The effect of abiotic and biotic factors on the size distribution and abundance of the blue mussel (*Mytilus edulis*) in tide pools on a rocky intertidal shore** SURG Vol. 6, No.2, Winter 2013, 78-83.
- 5) Kaitlyn Wagner **The effects of an autotomy event on the protein concentration of intact arms and respiration rate of *Asterias vulgaris*** SURG Vol. 6, No.2, Winter 2013, 84-87.
- 4) Shannon Ferraro **Effects of salinity on the fertilization success and early larval development of the sand dollar *Echinarachnius parma*** SURG Vol.6 , No.2, Winter 2013, 88-92.
- 3) Olivia Knight. **Acute toxicity of silver nitrate to *in vitro* fertilization of the sand dollar, *Echinarachnius parma*.** SURG Vol. 4, No.2, Winter 2011, 71-74
- 2) Jess Johansson. **An epibiont mediated increase in the susceptibility of *Mytilus edulis* to predation by *Nucella lapillus*.** SURG Vol. 4, No. 1, Fall 2010, 65-71
- 1) Katie Bell. **Effects of aerial exposure on size of the common barnacle (*Semibalanus balanoides*), an inhabitant of the intertidal zone in St. Andrews, New Brunswick.** SURG. Vol. 3, No. 2, Winter 2010, 52-58

INVITED RESEARCH SEMINARS

- *McMaster University*, Department of Biology, 2015
- *University of North Texas*, Department of Biology, November 2014
- *University of California, Irvine*, Department of Ecology and Evolutionary Biology, 2014
- *University of British Columbia*, Department of Zoology, 2013
- *International Union of Physiological Sciences 2013*, Birmingham, UK.
- *McMaster University*, Department of Biology, 2012
- *University of Western Ontario*, Department of Biology, 2012
- *University of Waterloo*, Department of Biology, 2011
- *University of Vermont*, Department of Physiology and Biophysics, 2009
- *University of Washington*, Muscle Group, 2008
- *University of Guelph*, Molecular and Cellular Biology, 2007
- *Brock University*, Department of Biology, 2006
- *McMaster University*, Department of Biology, 2006
- *University of Guelph*, Centre for Food and Soft Materials Science, 2006
- *University of Guelph*, Department of Zoology, 2004
- *University of Western Ontario*, Department of Biology, 2004
- *University of Leeds*, School of Biomedical Sciences, 2004
- *University of Washington*, Department of Pathology, 2004

INVITED RESEARCH SEMINARS CONTINUED

- *University of British Columbia*, Department of Zoology, 2003
- *University of Washington*, Department of Bioengineering, 2003
- *Annual Meeting of the Society of Experimental Biology*, Canterbury UK, 2001

Published Meeting Abstracts

- 61) Sears, E., and Gillis, T.E. **Comparing cardiac troponin C from three vertebrates: Insight into the evolution of cardiac contractile function.** Canadian Society of Zoologists, Annual Meeting, Montreal, 2014
- 60) Gillis, T.E., Plat, M., Arkell, A., Foster, A., Simpson J. **Remodeling of the diaphragm in mice during the development of heart failure.** International Union of Physiological Sciences Meeting. Birmingham UK, 2013
- 59) Gillis, T.E., **Gaining control, the role of the contractile element in the evolution of cardiac function.** International Union of Physiological Sciences. Birmingham UK, 2013
- 58) Gillis, T.E., **Phenotypic plasticity of the teleost heart; Changing form and function in response to thermal acclimation.** Society of Experimental Biology Annual Meeting, Valencia, Spain, 2013
- 57) Gillis, T.E., Plat, M., Arkell, A., Foster, A., Simpson J. **Remodeling of diaphragm function during the development of heart failure in mice.** Canadian Society of Zoologists, Annual Meeting, University of Guelph, 2013
- 56) Johnston, E.F., Alderman, S.L., and Gillis, T.E. **Chronic hypoxia exposure of trout embryos alters swimming performance and cardiac gene expression in larvae.** Canadian Society of Zoologists, Annual Meeting, University of Guelph, 2013
- 55) Sears E., and Gillis, T.E. **Characterization of cardiac contractile proteins of the African clawed frog (*Xenopus laevis*): Investigating the evolution of cardiac contractile function.** Canadian Society of Zoologists, Annual Meeting, University of Guelph, 2013
- 54) Klaiman, J.M., Pyle, W.G., and Gillis, T.E. **The effect of thermal acclimation on the functional properties of the isolated trout heart.** Canadian Society of Zoologists, Annual Meeting, University of Guelph, 2013
- 53) Pinto, N., Negishi, A, Fudge D.S., Gillis T.E., Kreplak, L. Rheinstadter, M., Yang F., **Physical characterization of fibres produced from recombinant vimentin.** Canadian Society of Zoologists, Annual Meeting, University of Guelph, 2013
- 52) Negishi, A, Kreplak, L. Rheinstadter, M., Armstrong, C., Gillis T.E., Fudge D.S., **Renewable material from hagfish slime thread proteins.** Canadian Society of Zoologists, Annual Meeting, University of Guelph, 2013
- 51) Klaiman, J.M., Pyle, W.G., and Gillis, T.E. **Functional and morphological changes in the trout heart during thermal acclimation.** Experimental Biology, Boston MA USA, 2013.
- 50) Klaiman, J.M., and Gillis, T.E. **Functional and morphological changes in the trout heart during thermal acclimation.** Society for Integrative and Comparative Biology Annual Meeting. San Francisco CA, USA, 2013.
- 49) Klaiman, J.M. and Gillis, T.E. **The effect of thermal acclimation on isometric force generation and cross-bridge kinetics in trout cardiac trabeculae.** Society of Experimental Biology annual meeting Salzburg, Austria, 2012

Published Meeting Abstracts continued

- 48) Johnston E. and Gillis, T.E. **The influence of hypoxia exposure during embryonic development on aerobic capacity of rainbow trout fry.** Canadian Society of Zoologists, Annual Meeting, Mount Allison University, Sackville, NB. 2012
- 47) Alderman, S.L., Klaiman, J.M., Deck, C.A., and Gillis T.E. **Effect of cold acclimation on troponin I isoform expression in striated muscle of rainbow trout** Canadian Society of Zoologists, Annual Meeting, Mount Allison University, Sackville, NB. 2012
- 46) Gillis T.E., **The evolution of the regulatory control of the vertebrate heart; the role of protein phosphorylation.** Canadian Society of Zoologists Annual Meeting, University of Ottawa, On, 2011.
- 45) Klaiman, J.M., and Gillis, T.E., **Characterizing functional changes in the myocardium of the trout heart during thermal acclimation.** Canadian Society of Zoologists Annual Meeting, University of Ottawa, 2011.
- 44) Gillis T.E. **The effects of temperature acclimation on the cardiac actin-myosin ATPase and cardiac proteome of rainbow trout.** International Congress on the Biology of Fishes, 2010, Barcelona Spain.
- 43) Gillis T.E., **The role of PKA in regulating the function of the trout heart.** International Congress on the Biology of Fishes, 2010, Barcelona Spain.
- 42) Gillis T.E., **The effects of temperature acclimation on the cardiac actin-myosin ATPase and cardiac proteome of Rainbow trout.** Society of Experimental Biology, 2010 Annual Meeting, Prague, CZ
- 41) Gillis T.E., **Evolution of the regulatory control of the vertebrate heart: the role of the contractile proteins.** Society of Experimental Biology, 2010 Annual Meeting, Prague, CZ
- 40) Klaiman, J, Fenna, A, Shiels, H.A. and Gillis T.E. **The effects of temperature acclimation on the cardiac actin-myosin ATPase and cardiac proteome of Rainbow trout.** Canadian Society of Zoologists Annual Meeting, University of British Columbia, BC, 2010.
- 39) Gillis T.E., Robertson A, Klaiman, J.M., **The role of PKA in regulating contractile function in the rainbow trout heart.** Canadian Society of Zoologists Annual Meeting, University of British Columbia, BC, 2010.
- 38) Miller, S.C., Wright, P.A., and Gillis, TE. **Chronic hypoxia alters cardiac regulation in rainbow trout (*Oncorhynchus mykiss*) during early life stages.** Canadian Society of Zoologists Annual Meeting, University of British Columbia, BC, 2010.
- 37) Robertson, A and Gillis T.E. **Phosphorylation and Ca²⁺ affinity of cardiac troponin in rainbow trout.** Comparative Physiology and Biochemistry Workshop, Keen Ont
- 36) Hanner, R, Gillis, T., Bentzen, P., Symington, A, and Legault T. **Bio-pedagogy and Barcoding: the Canadian National Market Survey.** 3rd International Barcode of Life Conference in Mexico City, 2009
- 35) Negishi A, Gilyan A, Kreplak L, Lim L-T, Gillis TE, and Fudge DS. (2009). **Renewable materials from intermediate filament proteins.** Advanced Foods and Materials Network Annual Scientific Conference, Guelph.
- 34) Korte, F.S., Regnier M. and Gillis T.E. **Influence of acidic pH on the rate of force development in cardiac muscle.** Annual Biophysical Society Meeting, Boston, MA Biophysical Journal: Supplement, 2009
- 33) Negishi A, Gilyan A, Kreplak L Lim L-T, Gillis T.E. and Fudge DS (2009). **Exploring the potential of intermediate filament protein-based materials.** Polymerix 2009, Rennes, France.

Published Meeting Abstracts continued

- 32) Kirkpatrick, K.P and Gillis, T.E **Identification and characterization of cardiac troponin I from the trout heart**, Annual Biophysical Society Meeting, Boston, MA *Biophysical Journal: Supplement*, 2009
- 31) Miller, S.C., Wright, P.A., and Gillis, T.E. **Oxygen Concentration in the Water Boundary Layer Next to Rainbow Trout (*Oncorhynchus mykiss*) Embryos is Influenced by Hypoxia Exposure Time, Metabolic Rate, and Water Flow**. Canadian Society of Zoologists Annual Meeting, University of Toronto Scarborough, On, 2009.
- 30) Kirkpatrick, K.P., Robertson, A., Klaiman, J.M. Polack, U, Gillis, T.E. **Cloning and Characterization of Trout Cardiac Troponin**. Canadian Society of Zoologists Annual Meeting, University of Toronto Scarborough, On, 2009
- 29) Klaiman J. and Gillis, T.E. **The Effect of Temperature Acclimation on the Activity and Ca²⁺ Sensitivity of Trout Cardiac Actin-Myosin ATPase**. Canadian Society of Zoologists Annual Meeting, University of Toronto Scarborough On, 2009.
- 28) Miller, S.C., Wright, P.A., and Gillis, T.E. **Ontogeny of the hypoxia response in rainbow trout (*Oncorhynchus mykiss*) embryos**. Comparative Physiology Workshop, Rice Lake On, 2009
- 27) Robertson A, Kirkpatrick, K.P., Robertson, A., Klaiman, J.M. Polack, U., Gillis, T.E. **Cloning and characterization of trout cardiac troponin I**. Comparative Physiology Workshop, Rice Lake On, 2009
- 26) Klaiman J. and Gillis, T.E. **Characterizing the cardiac proteome of rainbow trout during cold acclimation**, Canadian Society of Zoologists Annual Meeting, Halifax, NS, 2008.
- 25) Kirkpatrick, K.P and Gillis, T.E. **Identification and functional characterization of the troponin complex in trout heart** Canadian Society of Zoologists Annual Meeting, Halifax, NS, 2008
- 24) Gillis, T.E and C. R., Marshall. **Functional and evolutionary relationships of troponin C in striated muscle**. International Congress of Comparative Physiology and Biochemistry, Salvador, Brazil, 2007
- 23) Lulham, T. and Gillis, T.E. **Characterizing changes in protein expression in the trout heart using 2-D DIGE**. International Congress of Comparative Physiology and Biochemistry, Salvador, Brazil, 2007
- 22) Kirkpatrick, K.P and Gillis, T.E. **Cloning and sequence comparison of troponin I and troponin T from the trout heart**. International Congress of Comparative Physiology and Biochemistry, Salvador, Brazil, 2007
- 21) Kirkpatrick, K.P. and Gillis, T.E. **Cloning and sequence comparison of troponin I and troponin T from the trout heart**. Canadian Society of Zoologists Annual Meeting, Montreal, QC, 2007
- 20) Kreutziger, K, Gillis, T.E., Flint, G. et al. **Effects of EMD 57033 on cardiac contractile mechanics and kinetics**, February 2006, Annual Biophysical Society Meeting, Salt Lake City, Utah *Biophysical Journal: Supplement*, 2006
- 19) Gillis, T.E., Martyn, D.A., Regnier, M. **Altering the kinetics of cardiac activation through manipulating the interactions between cardiac troponin C and cardiac troponin I**, April 2005. San Diego, CA. *FASEB Journal*. Supplement (2005).
- 18) Gillis, T.E., Kreutziger, K.L., Clemmens, E.W., Rivera, A.J., Tikunova, S.B., Davis, J.P., Regnier, M. **Cardiac vs skeletal muscle: Differences in thin filament regulation of force development**. February 2005. Long Beach, CA. *Biophysical Journal: Supplement* (2005)

Published Meeting Abstracts continued

- 17) Gillis, T.E., Liang, B., Chung, F., & Tibbits, G.F. **Increasing mammalian cardiac myocyte contractility with residues identified in trout cardiac troponin C.** February 2005. Long Beach, CA. *Biophysical Journal: Supplement* (2005).
- 16) Kreuziger, K.L., Gillis, T.E., Tikunova, S., Regnier, M. **Effects of TnC with increased Ca²⁺ affinity on cooperative activation and force kinetics in skeletal muscle.** February 2004. Baltimore, MD. *Biophysical Journal: Supplement* (2004).
- 15) Gillis, T.E., & Tibbits, G.F. **Sequence manipulations of cardiac troponin C that increase Ca²⁺ affinity.** Annual Biophysical Society Meeting. March, 2003. San Antonio, TX. *Biophysical Journal: Supplement* (2003).
- 14) Blumenschein, T.M.A., Gillis, T.E., Tibbits, G.F. & Sykes, B.D. **Effects of temperature on protein structure: Trout troponin C.** Annual Biophysical Society Meeting. March, 2003. San Antonio, TX. *Biophysical Journal: Supplement* (2003).
- 13) Blumenschein, T.M.A., Gillis, T.E., Tibbits, G.F. & Sykes, B.D. **Structure of trout cardiac troponin C at 30 and 7 °C.** International Conference on Magnetic Resonance in Biological Systems. August, 2002. Toronto, ON. Published in conference proceedings.
- 12) Gillis, T.E., Moyes, C.D., & Tibbits, G.F. **Sequence manipulations of cardiac troponin C that allow cardiac function at low temperatures in teleost fishes.** The American Physiological Society Sponsored Meeting: The Power of Comparative Physiology Evolution, Integration and Application. August, 2002. San Diego, CA.
- 11) Gillis, T.E., & Tibbits, G.F. **Salmonid and icefish cardiac troponin C: A study in molecular evolution.** International Congress on the Biology of Fish Vancouver, BC. July, 2002. Published in conference proceedings.
- 10) Gillis, T.E., & Tibbits, G.F. **A fishy tale of molecular adaptation; the story of trout and icefish cardiac troponin C.** Canadian Society of Zoologists Annual Meeting. Leathbridge, AB. May, 2002. Published in conference proceedings
- 9) Gillis, T.E., Blumenschein, T.M.A., Sykes, B.D., & Tibbits, G.F. **Site I binds Ca²⁺ in trout cardiac troponin C.** Annual Biophysical Society Meeting. March, 2002. San Francisco, CA. *Biophysical Journal*. 82 (1): 1886 (2002)
- 8) Blumenschein, T.M.A., Gillis, T.E., Tibbits, G.F., & Sykes, B.D. **Effect of temperature on trout cardiac troponin C structure.** Annual Biophysical Society Meeting. March, 2002. San Francisco, CA. *Biophysical Journal*. 82 (1): 1887 (2002)
- 7) Gillis, T.E., & Tibbits, G.F. **Beating the cold, the functional evolution of troponin C in teleost fish.** Society of Experimental Biology Annual Meeting. April, 2001. Canterbury, England. Published in conference proceedings.
- 6) Gillis, T.E., and Tibbits, G.F. **A molecular investigation of thermal adaptation in the salmonid heart, the role of troponin C.** Canadian Society of Zoologists Annual Meeting. May, 2000. St. Andrews, NB. Published in conference proceedings.
- 5) Gillis, T.E., Marshall, C.R., Xue, X.H., Borgford, T.J., Tibbits, G.F. **Temperature and pH effects on Ca²⁺ affinity in mammalian and salmonid cardiac troponin C.** Annual Biophysical Society Meeting. April, 2000. New Orleans, LA. *Biophysical Journal*. 78 (1): 2161 (2000)
- 4) Gillis, T.E., Marshall, C.R., Xue, X.H., Borgford, T.J., Tibbits, G.F. **Temperature and pH effects on Ca²⁺ affinity in mammalian and salmonid cardiac troponin C.** International Conference of Comparative Biochemistry and Physiology. August, 1999. Calgary, AB. Published in conference proceedings.

Published Meeting Abstracts continued

- 3) Gillis, T.E., Stuart, J.S., and Ballantyne, J.S. **Estivation in the terrestrial snail, *Cepaea nemoralis*, induces compositional changes in mitochondrial membranes.** Canadian Society of Zoologists Annual Meeting. May, 1997. London, ON
- 2) Gillis, T.E., and Ballantyne, J.S. **The influences of sub-zero temperatures on mitochondrial membrane composition in marine bivalve mollusks.** Experimental Biology. April, 1997. New Orleans, LA. *FASEB Journal*. 11 (3): 161 (1997).
- 1) Gillis, T.E., & Ballantyne, J.S. **Thermal adaptation of mitochondrial membranes in Arctic marine bivalves.** Canadian Society of Zoologists Annual Meeting. May, 1996. St Johns, NF. Published in conference proceedings.

COURSES TAUGHT***Undergraduate***

- Undergraduate Thesis in Integrative Biology, 2014-2015
- Comparative Animal Physiology I, 2014
- Marine Biology and Oceanography Field Course. 2009, 2010, 2011, 2012 (20 students/offering)
- Lab Studies in Ichthyology. 2008, 2009, 2010, 2011 (~50 students/offering)
- Lab Studies in Herpetology. 2008 (~50 students/offering)
- Integrative Vertebrate Biology. 2008, 2009, 2010, 2011 (~100 students/offering)
- Animal Developmental Biology, 2006, 2007, 2008, 2009, 2013 (~200 students/offering)

Graduate

- Advances in Comparative Animal Physiology, 2015
- Graduate Biophysics, University of Guelph, 2010
- Current Topics in Cardiovascular Research, University of Guelph, 2009, 2010,
- Cardiac Physiology, University of Washington, School of Medicine. 2004.

COURSE DESIGN AND CURRICULUM DEVELOPMENT

- Capstone course in Marine and Fresh Water Biology, 400 level. Course creation 2013
- Animal Developmental Biology, 300 level. Lab redevelopment, 2010
- Integrative Vertebrate Biology, 400 level. Course creation, 2008
- Lab Studies in Ichthyology, 400 level. Course creation, 2008
- Lab Studies in Ornithology, 400 level. Course creation, 2008
- Lab Studies in Mammology, 400 level. Course creation, 2008
- Lab Studies in Herpetology, 400 level. Course creation, 2008

PROFESSIONAL ACTIVITIES***International Positions and Commitments***

Editorial Board Member, *Comparative Biochemistry and Physiology - Part B: Biochemistry & Molecular Biology* 2013-

Guest Editor of special issue (Volume 44, 2014) of *Journal of Thermal Biology* based on symposium organized at the 2013 Society of Experimental Biology Annual Meeting.

Symposium Organizer, “Remodeling of physiological systems in response to environmental change”. 2013 Society of Experimental Biology Annual Meeting, Valencia, Spain

PROFESSIONAL ACTIVITIES***International Positions and Commitments continued***

- Symposium Organizer**, “Structural modulators of muscle contraction affecting animal locomotion and behavior”. 2012 Society of Experimental Biology Annual Meeting Salzburg, Austria
- Chair** of the International Relations Committee on the Physiological Genomics Steering Committee of the American Physiological Society. **Elected position** 2011-2014
- Symposium Organizer**, “Keeping pace in a changing environment, the limits of regulatory control” held at the 2010 International Congress on the Biology of Fish, Barcelona Spain
- Symposium Organizer** for the International Congress of Comparative Physiology and Biochemistry. 2007 Salvador, Brazil
- Grant Reviewer** for National Science Foundation (US) and NSERC, 2005-
- Manuscript reviewer** for: Nature Climate Change, Journal of Physiology, Journal of Molecular and Cellular Cardiology, Archives of Biochemistry and Biophysics, Journal of Experimental Biology, PloS One, Journal of Fish Biology, Genomics, Lipids, Comparative Physiology and Biochemistry B. Journal of Experimental Zoology, Journal of Comparative Physiology -B.

National Positions and Commitments

- Chair of Local Organizing Committee** for the 2013 Annual meeting of the Canadian Society of Zoologists held at the University of Guelph. 433 delegates attended the meeting. 2012-2013
- Chair** of an Ontario Graduate Scholarship Award Panel in general biology. 2010
- Member** of Users Committee for the Huntsman Marine Science Center, St. Andrews, NB. 2009-2012
- Conference co-organizer**, 19th Annual Comparative Physiology Workshop. Rice Lake Ontario. ~100 participants. 2009
- Councilor** - Canadian Society of Zoologist. **Elected position** on council representing member interests. 2007- 2010

University Positions and Commitments

- Member** of search committee for Departmental Chair, Integrative Biology, 2015
- Chair** of Physiology curriculum subcommittee 2014 -
- Member** of Tenure and Promotion committee 2014 -
- Member** of Undergraduate Curriculum Committee 2011-2012
- Chair** of Seminar Committee, Department of Integrative Biology. 2007-2012
- Founding Member** of the Cardiovascular research group at Guelph.
<http://www.uoguelph.ca/CardiovascularResearch/index.html>
- Member** of Chairs Advisory Committee, Integrative Biology 2010 - 2012
- Member** of Graduate Teaching Assistantship assignment committee. 2010 - 2012
- Reviewer** of animal utilization protocols for academic/methodological merit for the Animal Care Committee. 2009-
- Co-organizer** of the Comparative Physiology Series in the Department of Integrative Biology 2009 -
- Co-creator**, with Dr. Doug Fudge, of the Comparative Physiology website at the University

of Guelph. <http://www.comparativephys.ca/>

Member of hiring committee for a faculty position in Functional Genomics in the Department of Integrative Biology. 2007

Member of the Northern Studies committee for the University of Guelph (committee adjudicates applications for the Northern Studies Award Program and dispenses funds) 2007-2009

GRADUATE STUDENT DEFENSES AND PHD QUALIFYING EXAMS

Student	Exam and Role	Year	Supervisor/Department
Marcia Chaisson	PhD – Exam committee Chair	2013	Ferguson/ Integrative Biology (IB)
Ashley Miller	PhD -Departmental Examiner	2013	Heyland/ IB
Peter McKay	MSc- Exam Committee Chair	2012	Griswold/IB
Marissa Darhi	MSc – Exam committee member	2012	Dawson/Molecular and Cellular Biology (MCB)
Steve Cho	MSc – Departmental examiner	2012	Bernier/IB
Fenghua Yang	PhD – Exam committee member	2012	Pyle/Biomedical Science (Biomed)
Mellisa Robillard	PhD – Exam committee Chair	2012	McLaughlin/IB
Dave Irwin	MSc – Exam committee member	2011	Van Der Kraak/IB
Julie Vanden Byllaardt	MSc – Exam committee Chair	2011	Ackerman/IB
Tegan Williams	PhD qualifying exam - Examiner	2011	Bernier/IB
Silvanna Miller	MSc – Exam committee member	2010	Gillis/Wright
Noah Shapiro	MSc – Exam committee member	2010	Ballantyne/IB
Laura Bedouin	PhD – Exam committee Chair	2010	Nudds/IB
Ashley Miller	PhD Qualifying Exam - Departmental examiner	2010	Heyland/IB
Maureen Mundia	MSc – Exam committee member	2010	Dawson/MCB
Jordan Klaiman	PhD Qualifying Exam – exam	2009	Gillis/IB
Noel Quin	PhD – Exam committee Chair	2009	Ackerman/IB
Kelly Kirkpatrick	MSc – Exam committee member	2009	Gillis/IB
Ryan Demers	MSc – Exam committee member	2009	Dawson/MCB
Anna Loncar	MSc – Exam committee member	2009	Dawson/MCB
Ursula Polack	MSc – Exam committee member	2009	Emes/Tetlow/MCB
Christina Simpson	MSc – Exam committee member	2008	Van Der Kraak/IB
Feng Hua Yang	PhD Qualifying Exam - committee member	2008	Pyle/ Biomed
Sarah Pinto	MSc – Exam committee Chair	2008	MacDougall
Eugene Wong	MSc – Exam committee Chair	2008	Hanner/Gregory
See Ling Liew	MSc – External Examiner	2008	Kirby/Biomed
Curtis McKague,	MSc – Exam committee Chair	2007	Fryxell/IB
Gustavo Enrique	MSc – External Examiner	2007	Pyle/Biomed
Natasha Frick	PhD – Departmental Examiner	2007	Ballantyne/IB
Collette Ward	MSc – Exam committee Chair	2007	McCann/IB

Jeremy Rouse	MSc – Exam committee Chair	2006	Brooks/IB
Cosima Ciuhandu	MSc – Departmental Examiner	2006	Wright-Stevens/IB
Pam Wesley	MSc – Exam committee Chair	2006	Brooks/IB
Barry Madison	PhD - Departmental Examiner	2006	Bernier /IB
Angela Eykelbosh	MSc - Departmental Examiner	2005	Vanderkraak/IB

MEMBERSHIP IN PROFESSIONAL ASSOCIATIONS

- Society of Experimental Biology
- American Physiological Society
- Biophysical Society
- Canadian Society of Zoologists

DELAYS

Parental leave January 1-June 1, 2010

CURRENT COLLABORATIONS

Dr. Sarah Alderman	Guelph	Characterizing the influence of bitumen exposure on cardiac develop and function in early life stages of sockeye salmon
Dr. M. Coppilino	Guelph	Regulation of collagen deposition by zebrafish cardiac fibroblasts
Dr. A.P. Farrell,	UBC	Regulatory pathways of cardiac function and the influence of bitumen exposure on cardiac function in sockeye salmon
Dr. D.S. Fudge	Guelph	Production of renewable fibres using recombinant intermediate filament proteins
Dr. G. Hauraz	Guelph	Effects of haemoglobin variants on protein expression in cultured oligodendrocytes
Dr. Chris Kennedy	Simon Fraser University	Characterizing the influence of bitumen exposure on cardiac develop and function in early life stages of sockeye salmon
Dr. W.G. Pyle	Guelph	Role of protein phosphorylation in regulating cardiac function
Dr. Jeff Richards	UBC	Regulatory control of the hagfish heart during anoxia exposure
Dr. G.R. Scott	McMaster	Proteomic studies of Bar Headed geese, adaptations for high altitude.
Dr. H.A. Shiels	Manchester	Cardiac hypertrophy in trout
Dr. J. Simpson	Guelph	Changes in the functional properties of the mouse diaphragm during heart failure
Dr. M. Vornanen	University of Eastern Finland	Influence of cold acclimation on the expression and phosphorylation of SERCA and phospholamban in the hearts of the burbot and crucean carp

REFERENCES

Dr. A.P. Farrell

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Canada Research Chair (Tier 1) in Molecular Cardiac Physiology
Department Chair and Professor
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