

Curriculum Vitae

Brent John Sinclair

Department of Biology
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Employment History:

July 2016 – present: Professor, Department of Biology, University of Western Ontario.
July 2011 – June 2016: Associate Professor, Department of Biology, University of Western Ontario.
Aug 2006 – June 2011: Assistant Professor, Department of Biology, University of Western Ontario.
Nov 2004 – May 2006: Postdoctoral Scholar, Dept. of Biological Sciences, University of Nevada-
Las Vegas, Las Vegas, Nevada, USA. **Host:** Dr S.P. Roberts
Oct 2001-Oct 2004: New Zealand Science and Technology Postdoctoral Fellow, Department of
Botany & Zoology, University of Stellenbosch, South Africa. **Host:** Prof. S.L.
Chown

Academic Qualifications:

2001: PhD (Zoology), University of Otago, New Zealand.
Thesis topic: “The Ecology and Physiology of New Zealand Alpine and Antarctic
Arthropods” (Supervisor: Dr David Wharton).
1996: BSc (1st Class Honours), Zoology, Otago

Research field: Integrative thermal biology of terrestrial invertebrates

Key current research:

Physiological, molecular, and evolutionary mechanisms underlying insect thermal biology
Overwintering and invasion potential of forest and agricultural pests
Impacts of climate change on insects
Thermal biology of polar arthropods

155 Papers published in peer-reviewed journals; **92** invited seminars & presentations.

h-index (WoS): **42**; (Google Scholar): **49**.

Awards Received (2006-present):

- 2019** Florence Bucke Science Prize, Faculty of Science, Western University
- Awarded to a mid-career faculty in recognition of research excellence.
- 2017** Discovery Accelerator Supplement, NSERC
- Awarded to top ~10% of proposals for Discovery Grants.
- 2013-2015** Faculty Scholar, University of Western Ontario
- Designation awarded in 2013 to 7 emerging scholars in recognition of outstanding scholarly achievements.
- 2012** William Evans Visiting Fellow, University of Otago, New Zealand
- Fellowship to support visits by distinguished scholars to the University.
- 2012** C. Gordon Hewitt Award – Entomological Society of Canada
- Awarded to recognise achievements of an Entomologist in Canada under the age of 40.
- 2010** Boutilier New Investigator award – Canadian Society of Zoologists
- Young investigator award (within five years of commencing faculty position).
- 2010** Mentor of Distinction award – Sanofi-Aventis Biotalent Challenge
- Awarded to one mentor of a student in a nationwide high school science competition. (For work with Jessie MacAlpine).
- 2009** Early Researcher Award, Ontario Ministry for Research and Innovation
- Competitive award providing research support to outstanding young researchers in Ontario.
- 2008** Fellow, Royal Entomological Society
- Fellows are elected on the basis of a substantial contribution to Entomology.

Leadership and Recent Significant Service

- Inaugural Editor-in-Chief, *Current Research in Insect Science* (2020-)
- Co-Chair, First Gordon Research Conference on Biology of Winter (2020)
- Associate Chair (Graduate), Department of Biology, Western University 2015-2018
- Chair, Local Organising Committee: 2016 Canadian Society of Zoologists Annual Meeting
- President, Canadian Society of Zoologists (2018-2019)
- Associate Editor: *Physiological and Biochemical Zoology*
- Editorial Board: *Current Opinions in Insect Science*, *Integrative and Comparative Biology*, *Journal of Experimental Biology*, *Journal of Insect Physiology*, *Journal of Thermal Biology*

Service

Significant committee contributions – since 2008:

International

Co-Chair (and leader of initial application) Gordon Supported Conference on Winter Biology
(Proposed 2018 for 2020 start).

Co-coordinator, International workshop on thermal biology of tropical gastropods, Brunei
Darussalam, 2014.

International Atomic Energy Agency Working group on Insect Dormancy (2014-2019)

International Atomic Energy Agency Working group on improving quality of mass-reared
Lepidoptera (2016-present)

International Steering committee, International Symposia on Environmental Physiology of
Ectotherms and Plants (2007-present); Organiser of 2013 meeting in London, Ontario

Coordinator of proposal document for Scientific Committee for Antarctic Research programme
'Antarctic Ecosystem Thresholds and Resilience', 2010

National & Provincial:

Natural Sciences and Engineering Research Council Discovery Grants Evaluation Group 1502
(2018-19, 20-21, 21-22)

Canadian Society of Zoologists (2nd VP 2016-2017, 1st VP 2017-18, President 2018-19, Past
President 2019-20)

Chair, Local Organising Committee, Canadian Society of Zoologists annual meeting, 2016.

Member of Sustainable Canada Dialogues (2014-present), interdisciplinary climate change group

Chair, Comparative Physiology and Biochemistry section, Canadian Society of Zoologists (2013-14)

National Board of Directors, Partners in Research (2012-2018; Board Secretary 2015-2018)

Emerald Ash Borer Science Advisory Committee (2007-2012)

Ontario Graduate Scholarships Selection (2008-2011, sub-panel chair 2010, 2011)

Board of Directors, Entomological Society of Ontario (2012-2015)

University-level:

Subcommittee on Priorities for Academic Development (2008-2011)

UWO Northern Research Committee (2009- 2012, co-chair 2011/12)

Faculty-level:

Biotron Experimental Climate Change Research Centre, UWO – Chair of insect module (2008-2010)

Steering committee, Bird Studies Canada – University of Western Ontario MOU, 2009-2011

Department of Biology Chair Selection Committee (2013-2014)

Faculty of Science Decanal selection committee (2015)

Department level:

Biology Outreach Committee (2009-2012)

Biology Undergraduate Education Committee (2006-2009)

Leader, Physiology & Biochemistry curriculum review (2007-2009)

Annual Performance Evaluation Committee (2009-2012)

Faculty Search Committee, Experimental climate change biology (2010-2011)

Appointments & Planning Committee (2011-2012, 2013-2015)

Biology Graduate Education Committee (2014-2015, Chair, 2015-2018)

Selected outreach highlights – since 2008

- Undergraduate Journal Club 2010-2012
- Participant and guest host, ‘This Week in Science and Engineering’ video podcast, 2011
- Guest Blogger, Royal Entomological Society’s National Insect Week, June 21-25, 2010
- Virtual Researcher On Call (VROC); 2007, 2009
- Tele-conference lessons with middle and high school classes in Ontario, 2010
- Interviews on CBC Radio, Rogers News, London Free Press, Fanshawe Community Radio related to Emerald Ash Borer research (2008, 2018); *Drosophila* research featured in national and international print and online media in 2009; unusual winters (2012-2014); Frozen frogs (Quirks & Quarks, 2013); plus general media involvement associated with insect research.
- Guest Researcher for ‘Imagination Award’ winners – high achieving science students in London, ON (2011).
- Public talks as part of Pinery Provincial Park summer series, 2010, 2011, 2012, and as part of Nature London’s ‘Nature in the City’ series 2015, as part of Royal Botanic Garden’s Spiders alive exhibit (2019)
- Invited ‘Science from the Source’ article for *Journal of Student Science and Technology*, co-authored with Katie Marshall. <http://journals.sfu.ca/jsst/index.php/jsst/article/view/49/45> (2015)
- National feature article on insect freeze tolerance – CBC television & website <http://www.cbc.ca/news/technology/insects-frozen-1.3265196> December 30, 2015
- Partners in Research Live event – online live discussion with 15 K-8 classes across Ontario. 10 Feb 2016
- Banting high school Grade 12 Biology – Metabolism and homeostasis. 40 Students, 3 h. 12 January 2017.
- My lab has organised ‘London Bug Day’, an entomology-focused outreach event in collaboration with the Entomological Society of Ontario, since 2013. 400+ attendees most years.
- Spotted-wing *Drosophila* Canadian Webinar January 2017. 87 growers and researchers nationwide.
- CBC London September 2018 – edible insects radio interview.
- SHAD Western July 2019– iNaturalist project. 68 high school students for a morning on campus.

External Thesis Examinations

2006 PhD Thesis submitted by E.M. Hugo, University of Stellenbosch, South Africa.
2008 PhD Thesis submitted by E. Marais, University of Stellenbosch, South Africa.
2011 MSc Thesis submitted by K. Bernards, Laurentian University, Canada.
2011 MPhil Thesis submitted by S. De Garis, University of Melbourne, Australia.
2011 PhD Thesis submitted by M. Laperie, Université de Rennes 1, France.
2012 MSc Thesis submitted by L. Des Marteaux, University of Guelph, Canada.
2015 PhD Thesis submitted by J.L. Andersen, Aarhus University, Denmark.
2015 PhD Thesis submitted by J.L. Allen, Stellenbosch University, South Africa.
2015 PhD Thesis submitted by K. Spong, Queen's University, Canada.
2018 PhD thesis submitted by Jacinta Kong, Melbourne University, Australia.
2019 Habilitation à Diriger des Recherches dissertation submitted by Dr. S. Pincebourde, Université de Tours, France.

Editor-in-Chief

Current Research in Insect Science (2020-)

Editorial Board Member

Current Opinions in Insect Science (Editorial board 2013-; Guest Editor 2014)
Functional Ecology (Associate Editor 2015-2017)
Journal of Experimental Biology (2017- 2020)
Journal of Insect Physiology (2015- present)
Journal of Thermal Biology (2012 -)
Integrative and Comparative Biology (2018-2020)
New Zealand Journal of Ecology (Associate Editor, 2014-2017)
Physiological & Biochemical Zoology (Editorial board 2012 - ; Associate Editor 2015-)
The Canadian Entomologist (Physiology subject editor, 2013-2017)

Peer Review for Granting Agencies

Agriculture and Agri-Food Canada
Australian Research Council (Assessor of International Standing)
Australian Antarctic Division
BARD (Israel-US cooperation grants)
California Dept. Food & Agriculture
Czech Academy of Sciences
DFG (Germany)
Eva Crane Trust (UK)
European Research Council
ESF Flanders Research Organisation (Belgium)

FONDECYT (Chile)
Graduate Women in Science Fellowships (USA)
Le Studium, France
Natural Environment Research Council (UK)
NSERC (Canada)
National Geographic Society
National Research Foundation (South Africa)
National Science Centre (Poland)
National Science Foundation (USA)
NWO (Netherlands)

Peer Review for Scientific Journals

(Approximately 40 *ad hoc* reviews per year)

Acta Oecologica

Agricultural and Forest Entomology

American Naturalist

Annals of the New York Academy of Sciences

Animal Behavior

Antarctic Science

Austral Ecology

Biochemical Journal

BioControl

Biological Control

Biological Invasions

Biological Journal of the Linnean Society

Biology Letters

BMC Evolutionary Biology

BMC Genomics

Bulletin of Entomological Research

Canadian Entomologist

Canadian Journal of Forest Research

Canadian Journal of Zoology

Cell Biochemistry and Function

Comparative Biochemistry and Physiology

Crop and Pasture Science

CryoLetters

Current Biology

Ecological Entomology

Ecology

Ecology and Evolution

EMBO Reports

Environmental Entomology

Environmental Science and Technology

European Journal of Entomology

Evolutionary Applications

Evolutionary Ecology

Functional Ecology

Gene

Great Lakes Entomologist

Heredity

Insect Biochemistry and Molecular Biology

Insect Molecular Biology

Insects Sociaux

Integrative and Comparative Biology

International Journal of Astrobiology

Journal of Animal Ecology

Journal of Asia-Pacific Entomology

Journal of Biogeography

Journal of Comparative Physiology B

Journal of Economic Entomology

Journal of Evolutionary Biology

Journal of Experimental Biology

Journal of Experimental Zoology

Journal of Insect Physiology

Journal of Sea Research

Journal of Thermal Biology

Journal of Zoology

Metabolomics

Medical and Veterinary Entomology

Molecular Ecology

Molecular Phylogenetics and Evolution

Nature Communications

New Zealand Journal of Zoology

Oecologia

Palaeogeography, Palaeoclimatology, Palaeoecology

PeerJ

Physiological and Biochemical Zoology

Physiological Entomology

Physiological Genomics

PloS Biology

PLoS ONE

PNAS

Polar Biology

Proceedings of the Royal Society B

Science

Scientific Reports

South African Journal of Science

Terrestrial Arthropod Reviews

Trends in Ecology and Evolution

Western North American Naturalist

Teaching and Mentoring

Research Mentoring

Current:

Postdoctoral

Dr. Meghan Duell

Mechanisms of insect freeze tolerance

Dr. Alex Torson

Physiological genomics of diapause in Asian longhorn beetle

Dr. Nasim Amiresmaeili

Using thermal biology theory to inform biocontrol agent selection
(co-supervised with Dr. Tara Garipey, Agriculture and Agri-Food Canada)

PhD

E. Seun Esan

Colorado Potato Beetle cold tolerance (on leave 2019-)

Yanira Jiménez Padilla

Effects of gut yeast flora on insect performance

- Ontario Graduate Scholarship 2019

Jacqueline Lebenzon

Metabolism and cryoprotection in Colorado potato beetle

- NSERC Canada Graduate Scholarship (M) 2016
- Ontario Graduate Scholarship 2017
- NSERC PGS-D Scholarship 2017
- Battle Prize for best student poster, Canadian Society of Zoologists 2017
- JEB Travelling fellowship 2017
- Malcolm Ferguson Award 2018
- Best Student poster, SICB Division of Comparative Physiology and Biochemistry
- J.D. Detwiler award for graduate research in Biology 2019
- Best presentation, Biology Graduate Research Forum 2019
- President's Prize for best Oral presentation, Entomological Society of Ontario 2019

Kurtis Turnbull

Overwinter energetics of Western Bean Cutworm

(Co-supervised with Jeremy McNeil)

- QEII graduate scholarship 2015
- NSERC Canada Graduate Scholarship 2016
- Holeyton Prize for best student poster in Comparative Physiology and Biochemistry, Canadian Society of Zoologists 2016
- NSERC Doctoral Scholarship 2017
- President's Prize for best poster, Entomological Society of Ontario 2017
- JEB Travelling Fellowship 2018
- President's Prize for best Oral presentation, Entomological Society of Ontario 2018
- President's Prize for best poster presentation, Entomological Society of Ontario 2019

MSc

Kevin Ong

Interpopulation comparison of Asian longhorn beetle transcriptomes.
(Co-supervised with Amanda Roe, AAFC)

Alyssa Stephens

Accumulation of trehalose in freeze tolerant crickets.

BSc Honours Thesis

Claire Baragar

Mitochondrial physiology of freeze-tolerant crickets.

Advisory committees for a further 6-8 Western graduate students, co-supervisor of Clare Beet (PhD student, University of Waikato, New Zealand) and Claudio Cubillos (PhD student, University of Auckland), PhD advisory committee for Alexander Loureiro, University of Guelph.

Past trainees:

UWO

Postdoctoral:

2015-2017 – Dr. Sirpa Kaunisto. Multiple stressors in insects.

- Now a postdoc at University of Eastern Finland

2010-2014 - Dr. Hiroko Udaka. Physiology of thawing in insects.

- Now an Assistant Professor, Kyoto University, Japan

2012-2013 – Dr. Annegret Nicolai. Ecophysiology of *Cepaea nemoralis* in Canada.

- Now a researcher, Université de Rennes Paimpont field station, France

2008-2010 – Dr. Stephanie Sobek. Plasticity in cold tolerance of Emerald Ash Borer.

- Now Executive Director of the RARE Charitable Research Reserve, Waterloo, ON, Canada

2006-2008 – Dr Arun Rajamohan. Cryopreservation of *Drosophila*.

- Now a permanent researcher at USDA Fargo, ND, USA

PhD

2019 – Susan Anthony - Cold tolerance of arachnids

- Northern Scientific Training Programme grant, 2015, 2016, 2017 (declined)
- NSERC Canada Graduate Scholarship, 2016
- JD Detwiler award for graduate Research in Biology 2017

2018 – Jantina Toxopeus - Mechanisms underlying insect freeze tolerance

- NSERC Canada Graduate Scholarship 2014
- Orthopterists' Society research grant, 2015
- NSERC Michael Smith Foreign Study supplement
- Ontario Graduate Scholarship 2017
- John W. Arnold Fellowship for best PhD thesis 2019
- Now a postdoc at University of Colorado Denver (to begin Faculty position at St. Francis Xavier University, NS, in July 2020)

2017 – Lauren Des Marteaux - Epithelial transport in chill-susceptible insects.

- NSERC Canada Graduate Scholarship 2013
- Entomological Society of Ontario best poster prize, 2014, 2015
- Entomological Society of Canada best oral presentation (Biocontrol), 2015
- Irene Uchida Fellowship in Life Sciences 2016
- Now a postdoc at Osaka City University, Japan.

2017 - Laura Ferguson – Eco-immunology of overwintering insects.

- NSERC postgraduate scholarship 2013
- CSZ Helen Battle Prize for best poster, 2014
- Ruth Horner Arnold Graduate Fellowship in Biology, 2014
- Michael Locke Travel Scholarship, 2014
- Best speaker, Division of Ecoimmunology and Disease Ecology, Society for Integrative and Comparative Biology Annual Meeting, Florida, USA, 2015
- T.W.M. Cameron award for best PhD thesis, Canadian Society of Zoologists (2018)
- Now a Killam postdoc at Dalhousie University.

2014 - Tanya Haupt – Thermal biology of sub-Antarctic Caterpillars

- Centre for Invasion Biology, University of Stellenbosch; Primary supervisor Prof. Steven Chown
- Now a research scientist at Department of Agriculture, Forestry & Fisheries, South Africa.

2013 – Heath MacMillan – Biochemistry of chill coma in insects.

- Joint supervisor: Jim Staples, UWO
- Ontario Graduate Scholarship 2009
- NSERC Canada Graduate scholarship 2010
- Detwiler award for best PhD thesis, Department of Biology, 2012
- Now an Assistant Professor at Carleton University.

2013 – Katie Marshall – Effects of repeated cold exposure in insects.

- Best poster in Invertebrate Zoology, Society for Integrative and Comparative Biology annual meeting 2009.
- Strong inference prize for student paper testing multiple hypotheses. SICB annual meeting 2009.
- Best oral presentation, Entomological Society of Ontario, 2010.
- QEII graduate scholarship in Science and Technology 2010
- NSERC postgraduate scholarship 2011
- Bruce Sidell award for best presentation in Comparative Physiology and Biochemistry, SICB annual meeting 2013.
- Now an Assistant Professor, University of British Columbia.

2011 – Caroline Williams – Overwintering energetics of Lepidoptera

- Scholander Award, American Physiological Society 2010
- Lumsden Fellowship, UWO Faculty of Science 2010
- Faculty of Science TA award 2010
- Ruth Horner Arnold Graduate Scholarship, Biology, UWO, 2010
- Ontario Graduate Scholarship, 2011
- Now an Assistant Professor at University of California, Berkeley.

MSc

- 2009 – Lauren Strachan – Evolution of cold tolerance strategies in *Drosophila* larvae.
- Entomological Society of Ontario Graduate student Travel prize, 2008.
 - Now in research and development in the pesticide industry.
- 2010 – Jill Crosthwaite – Overwintering Biology of Emerald Ash Borer.
- Now a conservation biologist for the Nature Conservancy of Canada.
- 2010 – Jian (Jane) Zhang – Gene expression in *Drosophila* after repeated cold exposures.
- Now a Postdoc, Harvard University/MIT Broad Institute.
- 2012 – Justin Saindon – Does gene flow prevent adaptation at range edges?
- Now a Senior Analyst for the University Health Network, Toronto.
- 2012 – Litza Coello – Mechanisms underlying plasticity of chill susceptibility in crickets
- Now a technician, Koppert Biological Systems, Ontario.
- 2012 – Evelyn Boychuk – Cold tolerance of *Chrysomela aeneicollis*
- Lost contact.
- 2013 – Golnaz Salehipour-shirazi – Cold-activation of the *Drosophila* immune system
- Graduated PhD, Western University
- 2014 – Ruth Jakobs – Overwintering biology of *Drosophila suzukii*
- Graduated PhD, Bielefeld University, Germany
- 2015 – Alexander McKinnon – Freeze tolerance in *Gryllus veletis*
- Ontario Graduate Scholarship 2015
 - Now at University of Manitoba Medical School
- 2015 – Yanira Jiménez Padilla – Effects of gut yeast on *Drosophila melanogaster* performance
- Now a PhD student, Western University
- 2018 – John Ciancio – Overwintering biology of Brown Marmorated Stink Bug
- Joint supervisor: Tara Gariepy (AAFC)
 - Now a technician at Agriculture and Agri-Food Canada

Honours thesis: (first destination after completion noted)

- 2018/19 – Peter Denezis (Medical School, UWO), Adam Smith (MSc UT Mississauga)
- 2017/18 – Brynne Duffy (MSc, UWO), Aisa Kuper-Psencnik (MSc Saskatoon), Lamees Mohammad (MSc Calgary), Joanne Tang (MSc UWO)
- 2014/15 – Michael Brown (Medical School, Ireland)
- 2013/14 – Jacqueline Lebenzon (PhD, my lab)
- 2011/12 – Matt Clarke (MSc programme, University of Guelph), Sarah Lake (MBA in Biotech, McMaster University), Soohyun (Julia) Ahn (Dental School, Australia).
- 2010/11 – Xinyang (David) Bing (MSc, Laurentian University), Victoria Ransberry (MSc, McMaster University).
- 2009/10 - Aimee Bazinet (medical lab tech), Anthony Renda (MSc, University of Victoria)
- 2008/09 – Diana Balmer (clinical trials management), Erfan Vafaie (MSc, Simon Fraser University), Chelsie Warshafsky (MS, Columbia University)
- 2007/08 – Heath MacMillan (PhD, my lab)
- 2006/07 – Christopher Lee (lost contact)

NSERC Summer students

2017 – Peter Denezis
2014 – Daye Li, Nick Chornenki-Jackson
2013 – Daye Li
2011 – Joseph Stinziano (PhD programme, UWO)
2010 – Richard Sove; Joseph Stinziano (PhD programmes, UWO)
2009 – Alison Wardlaw (PhD programme, University of Toronto)
2008 – Sourabh Arora; Jillian Walsh (medical school at McMaster and UWO, respectively)
2007 – Heath MacMillan, Jillian Walsh

High School students

2018-2019 Mika Little
2016-2017 Laura Forster
2009-2012 Jessie MacAlpine Science fair projects

- Gold medal, Canada-wide Science Fair 2010, 2011

Undergraduate Volunteers

I firmly believe in work study and volunteer experiences as formative in the development of capacity and enthusiasm for research. I usually have between 10 and 20 undergraduate volunteers in my laboratory in various capacities. A complete list of them (>70 in past five years) can be found on my website.

Pre-UWO Mentoring

PhD

Matthew Scott (2006, University of Otago). Ecological processes on frost patterned ground on the Old Man Range, Central Otago, New Zealand

- Co-supervised with Assoc.-Prof. K. Dickinson, Botany Department and Dr B. Barrett, Agresearch.

MSc

Caroline Williams (2004, University of Otago). Haemolymph correlates of parasite-induced behavioural changes in an Amphipod-Nematode model system

- co-supervised with Prof. R. Poulin, Zoology Department.

BSc (Hons) /Honors Program

Theresa Nilson (2005, UNLV); Saskia Goldberg (2004, University of Stellenbosch); Elrike Marais (2002, University of Stellenbosch).

Undergraduate Teaching (since 2006)

Honours Research Thesis – 76 4th year students. Full year, coordinator. 3h lecture/week plus coordinated evaluation and timing. 2018/19.

Animal Physiology I – 80 3rd year students. One semester, 3 lectures + tutorial/week. 2013, 2014, 2015, 2016, 2017, 2018.

Seminar in Physiology – 12 4th year students. One semester, 3 h session/week. 2013, 2014.

Comparative Animal Physiology – 350-575 2nd year students. One semester, 2 lectures + Lab/week. 2007, 2008, 2009

Organismal Physiology – 300-450 2nd year students. New course, 2010, taught again in 2011, and as a guest lecturer in 2017.

Nature of Biological Things – 40-60 non-Science majors. One semester, 3 lectures/week.

- Course title changed to “The Secrets of Life”, 2010, taught again 2011.

Alpine Ecology – 18 3rd/4th year students as part of Ontario Universities’ Field Biology Programme.

- Co-taught with Prof. Jack Millar.

University of Otago (as a William Evans Fellow 2012-13):

Environmental Physiology – Six 4th year students. Three 2 h seminar-style sessions in 2012.

Graduate Teaching (since 2006)

Methods in Physiology and Biochemistry – 16 Students. Co-taught with Drs Jim Staples and Don Hayden (2007) – I covered experimental design and data analysis.

Insect Functional Ecology – 6 students (2008).

Integrative Physiology – 9 students. Co-taught with Dr. Louise Milligan (2011).

-omics in animal physiology – 4 students. Co-Taught with Dr. Chris Guglielmo (2013).

Scientific Leadership – 9 students. Co-taught with Dr. Louise Milligan (2016, 2017, changed to a workshop format for 2018).

Biology and Philosophy – 9 students. Co-taught with Dr. Gillian Barker, Dept. Philosophy (2017).

Career development –2013-2018, I ran 3-5 formal career development workshops for graduate students and postdocs per term, and led an informal ~monthly career-related discussion with postdocs in the department.

Research Activities

Current Professional Memberships

Canadian Society of Zoologists
Entomological Society of Canada
Entomological Society of Ontario

Royal Entomological Society
Society for Integrative and Comparative Biology

Current Research Funding

2020 Co-PI (with Sapna Sharma, York University) ‘Gordon Research Conference: Biology of Winter’. Raised >USD\$30,000 from the Gordon Conference organisation, Company of Biologists, Elsevier, Sable Systems International, and several Universities.

2019 PI ‘Stress transcriptome of Arctic Collembola’ Polar Knowledge Canada CAD\$22,000.

2018-2020 Co-PI ‘Thermal biology of forest pests; Western/Canadian Forest Service collaborative research funds CAD\$100,000 (Co-PIs Amanda Roe and Chris MacQuarrie, CFS)

2018-2021 AI, Royal Society of New Zealand Marsden Fund ‘Plasticity or Adaptation: Evolution of thermal performance in New Zealand stick insects’ NZD\$925,000 PI: Thomas Buckley, Landcare Research New Zealand.

2017-2021 PI, NSERC Discovery Grant ‘Biology of arthropods at low temperatures’ CAD\$290,000 + Discovery Accelerator Supplement CAD\$120,000

2016-2020 Co-PI, Genome Canada/Genome BC Large Scale Applied Research Programme ‘BioSurveillance of Alien Forest Enemies (bioSAFE)’. CAD\$8.5M . PI: Richard Hamelin, UBC. (~\$500,000 + sequencing and travel to Sinclair).

Past Research Funding

2015-2018 Ontario Bean Growers ‘Reproductive biology and overwintering capacity of the Western Bean Cutworm’. CAD\$178,755. PI: Jeremy McNeil, Western University.

2016-2017 PI Canadian Food Inspection Agency ‘Thermal biology of dipteran soft fruit pests’. CAD\$ 25,000

2016-2017 PI UWO NSERC Accelerator Grant ‘Physiology and climate change of northern spiders: building a track record in Arctic research’ CAD\$22,343

2012-2017 PI, NSERC Discovery Grant ‘Integrative biology of insects at low temperatures’. CAD\$235,000

2014 – PI, NSERC Interaction grant to support meetings about sterile insect technique with fruit growers. \$1600.

2014 – FP7 INTERACT funds to support collaborative research in Siberia. EUR4500 PI: Jesper Sørensen, Aarhus University.

2014 – PI, Research contract to review insect cold tolerance in the context of risk assessment. Canadian Food Inspection Agency CAD\$9800.

2014 – Co-applicant, NSERC Research Tools and Instrumentation ‘MoBEES: a facility for Molecular Studies in Biodiversity, Ecology, and Environmental Sciences’ CAD\$130,838

2013 – Co-PI, Company of Biologists, Funding to support symposium at Entomological Society of Canada CAD\$2300 (with Katie Marshall).

2013 – PI, Funding for support of ISEPEP5 conference (Company of Biologists, Journal of Insect Physiology, Sable Systems International, Western University; total \$8500)

2012-2013 PI, UWO Academic Development Fund ‘A temperature-controlled micro-volume Ussing chamber to explore the role of gut epithelial transport in insect chilling injury’. CAD\$23,584

2010-2013 Associate Investigator, Royal Society of New Zealand Marsden Fund ‘Evolution of cold tolerance in New Zealand Stick Insects’. CAD\$ 604,000 total. PI: Thomas Buckley, Landcare Research New Zealand; Associate Investigator: Melody Clark, British Antarctic Survey.

2008-2013 Co-I, South African Antarctic Programme ‘Albatrosses as Ecosystem Engineers’. PI: S.L. Chown, Co-I: B.J. Jansen van Vuuren (University of Stellenbosch). ZAR 1,863,350 plus logistic support.

2008-2013 PI, CFI Infrastructure Operating Fund. CAD\$43,514

2007-2012 PI, NSERC Discovery Grant ‘Low temperature biology of insects’. CAD\$150,000.

2007-2012 PI, UWO Startup. CAD\$108,000

2007-2012 PI, CFI-LOF/ORF ‘Overwintering insects in a changing climate’. CAD\$544,155.

2010-2011 PI, NSERC RTI (additional application to UWO Academic development fund) ‘Replacement freezer’. RTI:CAD\$13,563; ADF:CAD\$4935. Co-PI: Sheila Macfie, Dept. Biology, UWO.

2010 – PI, Canadian Department of Foreign Affairs and Trade. Visit of graduate students from University of Stellenbosch, South Africa. CAD \$20,000

2008-2010 PI, NSERC Strategic (Supplementary Competition) ‘Overwintering Biology of Emerald Ash Borer’. CAD\$199,822.

2008-2011 Sub-Grant, British Antarctic Survey. ‘Microarray Analysis of Canadian Springtails. PI: M. Clark, BAS. CAD\$ 11,700.

2007-2009 PI, UWO Academic Development Fund. ‘Gene expression and freeze tolerance in porcelain crabs’. CAD\$7,494.

2007 PI, Canadian Food Inspection Agency research contract. ‘High temperature tolerance of Emerald Ash Borer’. CAD\$14,000.

2006-2008 PI, National Institutes of Health R21 (Exploratory/Developmental) ‘Cryopreservation of the Model Organism *Drosophila melanogaster*’. Co-Investigators: S.P. Roberts, A.G. Gibbs (UNLV), V. Kostal (Czech Academy of Sciences). US\$ 275,000 + overheads.

- 2007-2008 PI, NSERC Research Tools and Infrastructure (RTI) ‘Accessories for the measurement of enzyme activities at low temperatures’. CAD\$12,382.
- 2004 South African National Antarctic Programme. ‘Cumulative impacts of environmental stress on indigenous and introduced species’. (Co-Principal Investigator with Prof. S. L. Chown). ZAR43000 plus support-in-kind of ZAR100 000.
- 2003-2004 National Geographic Society ‘Cold tolerance of Southern African insects’ (Principal Investigator).
US\$ 15,751
- 2002-2003 Logistic support from Antarctica New Zealand for Event K140 Biology of Antarctic Springtails (Event Leader and Co-Principal Investigator with Prof. S. L. Chown). Support-in-kind of NZ\$ 263,000.
- 2001-2004 New Zealand Science and Technology Postdoctoral Research Fellowship
‘Ecophysiology of Arthropods living in extreme environments’. NZ\$ 201,482
- 1998-2000 National Geographic Society (Principal Investigator) Ecology and physiology of microarthropods at Cape Bird, Ross Island, Antarctica. US\$ 8,765
- 1998 Visiting Scientist Expenses, British Antarctic Survey. £ 500.
- 1997-2000 Logistic support from Antarctica New Zealand for Event K067 Ecology of terrestrial Antarctic fauna (Field Leader, with Dr D. A. Wharton [Principal Investigator]). Support-in-kind of c. NZ\$ 100,000.
- 1997 - 1999 Miss E. L. Hellaby Indigenous Grasslands Research Trust (Principal Investigator)
‘Ecophysiology of New Zealand alpine insects’. NZ\$ 18,630

Research Output

My students/postdocs since 2006 in **bold**; other students/postdocs since 2001 underlined.

Peer-reviewed Journal Publications

In press

1. **Jiménez-Padilla, Y., Esan, E.,** Floate, K.D. & Sinclair, B.J. Persistence of diet effects on the *Drosophila suzukii* microbiota. *Canadian Entomologist*.
2. **Jiménez-Padilla, Y.,** Ferguson, L.V., & Sinclair, B.J. Comparing apples and oranges (and blueberries and grapes): fruit type affects development and cold-susceptibility of immature *Drosophila suzukii*. *Canadian Entomologist*.
3. **Torson, A.S., Des Marteaux, L.E.,** Bowman, S., **Zhang, M.L., Ong, K.,** Doucet, D. Sinclair, B.J., & Roe, A.D. Dissection of cerambycid beetle larval tissues for physiological and molecular studies. *Canadian Entomologist*.

Published

4. **Lebenzon, J.E., Des Marteaux, L.E. & Sinclair, B.J.** 2020. Reversing sodium differentials between the hemolymph and hindgut speeds chill coma recovery but reduces survival in the fall field cricket, *Gryllus pennsylvanicus*. *Comparative Biochemistry and Physiology A* 244: 110699.
5. **Ferguson, L.V. & Sinclair, B.J.** 2020. Thermal variability and plasticity drive the outcome of a host-pathogen interaction. *American Naturalist* 195: 603-615.
6. **Toxopeus, J.,** Li, N.G., Moos, M., Sørensen, J.G. & Sinclair, B.J. 2020. A comparison of low temperature biology of *Pieris rapae* from Ontario, Canada, and Yakutia, Far Eastern Russia. *Comparative Biochemistry and Physiology A* 242: 110649.
7. **Anthony, S.E.,** Buddle, C.M., Høye, T.T. & Sinclair, B.J. 2020 Thermal limits of summer-collected *Pardosa* wolf spiders (Araneae: Lycosidae) from the Yukon Territory and Greenland. *Polar Biology* 42: 2055-2064.
8. **Tang, J.M., Jiménez-Padilla, Y.,** Lachance, M.-A. & Sinclair, B.J. 2019. Gut yeasts do not improve desiccation survival in *Drosophila melanogaster*. *Journal of Insect Physiology* 117: 103893.
9. **Toxopeus, J.,** Košťál, V. & Sinclair, B.J. 2019. Evidence for non-colligative function of small cryoprotectants in a freeze-tolerant insect. *Proceedings of the Royal Society B* **286**: 20190050.
10. **Toxopeus J., McKinnon, A. H., Štětina, T., Turnbull, K.F. & Sinclair, B.J.** 2019. Laboratory acclimation to autumn-like conditions induces freeze tolerance in the spring field cricket *Gryllus veletis* (Orthoptera: Gryllidae). *Journal of Insect Physiology* 113: 9-16.
11. **Anthony, S.E. & Sinclair, B.J.** 2019. Overwintering red velvet mites are freeze tolerant. *Physiological and Biochemical Zoology* 92: 201-205.
12. Karsten, M., Lebenzon, J.E., Terblanche, J.S. & Sinclair, B.J. 2019. Loss of ion homeostasis is not the cause of chill coma or impaired dispersal in false codling moth *Thaumatotibia leucotreta* (Lepidoptera: Tortricidae). *Comparative Biochemistry and Physiology A* 229: 40-44.
13. **Toxopeus, J., Des Marteaux, L.E. & Sinclair, B.J.** 2019. How insects become freeze tolerant: the transcriptomic underpinnings of acclimation in *Gryllus veletis*. *Comparative Biochemistry and Physiology D* 29: 55-66.
14. Barton, M.G., Terblanche, J.S. & Sinclair, B.J. 2019. Incorporating temperature and precipitation extremes into process-based models of African Lepidoptera changes the predicted distribution under climate change. *Ecological Modelling* **394**: 53-65.

15. Marshall, D.J., Brahim, A., Mustapha, N., Dong, Y. & Sinclair, B.J. 2018. Substantial heat-tolerance acclimation capacity in tropical thermophilic snails, but to what benefit? *Journal of Experimental Biology* 221: jeb187476.
16. **Toxopeus, J.** & Sinclair, B.J. 2018. Mechanisms underlying insect freeze tolerance. *Biological Reviews* 93: 1891-1914.
17. **Ferguson, L.V.**, Dhakal, P., **Lebenzon, J.E.**, Heinrichs, D.E., Bucking, C. & Sinclair, B.J. 2018. Seasonal shifts in the insect gut microbiome are concurrent with changes in cold tolerance and immunity. *Functional Ecology* 32: 2357-2368.
18. Cuddington, K., **Sobek-Swant, S.**, **Crosthwaite, J.C.**, Lyons, D.B. & Sinclair, B.J. 2018. Potential emerald ash borer distribution for Canadian cities and North America: A mechanistic model. *Biological Invasions* 20: 2661-2677.
19. **Marshall, K.E.** & Sinclair, B.J. 2018. Repeated freezing induces a trade-off between cryoprotection and egg production in the goldenrod gall fly, *Eurosta solidaginis*. *Journal of Experimental Biology* **221**: jeb177956. *Featured in Inside JEB.*
20. Ferguson, L.V., Kortet, R. & Sinclair, B.J. 2018. Eco-immunology in the cold: the role of immunity in shaping overwintering survival of ectotherms. *Journal of Experimental Biology* **221**: jeb163873.
21. Sinclair, B.J. & Marshall, K.E. 2018. The many roles of fats in overwintering insects. *Journal of Experimental Biology* **221**: jeb161836.
22. **Des Marteaux, L.E.**, Stinziano, J.R. & Sinclair, B.J. 2018. Effects of cold on rectal macromorphology, ultrastructure, and cytoskeletal stability in *Gryllus pennsylvanicus* crickets. *Journal of Insect Physiology* **104**: 15-24.
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25. **Newman, C.**, **Toxopeus, J.**, **Udaka, H.**, **Ahn, S.**, Martynowicz, D., Graether, S., Sinclair, B.J. & Percival-Smith, A. 2017. CRISPR-induced null alleles show that *Frost* protects *Drosophila melanogaster* reproduction after cold exposure. *Journal of Experimental Biology* **220**: 3344-3354.
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28. Potvin, C. et al. (65 other authors in alphabetical order, including Sinclair, B.J.) 2017. Stimulating a Canadian narrative for climate. *FACETS* **2**: 131-149.
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112. **Scott, M.B.,** Dickinson, K.J.M., Barratt, B.I.P. & Sinclair, B.J. (2008) Temperature and moisture trends in non-sorted earth hummocks and stripes on the Old Man Range, New Zealand: Implications for mechanisms of maintenance. *Permafrost and Periglacial Processes* **19**: 305-314.
113. Chown, S.L., Sinclair, B.J. & Jansen van Vuuren, B.J. (2008) DNA barcoding and the documentation of alien species establishment on sub-Antarctic Marion Island. *Polar Biology* **31**: 651-655.
114. **Rajamohan, A.** & Sinclair, B.J. (2008) Short term hardening effects on survival of acute and chronic cold exposure by *Drosophila melanogaster* larvae. *Journal of Insect Physiology* **54**: 708-718.

115. Sinclair, B.J. & **Rajamohan, A.** (2008) Slow and stepped re-warming after acute low temperature exposure do not improve survival of *Drosophila melanogaster* larvae. *The Canadian Entomologist* **140**: 306-311.
116. Sinclair, B.J., Nelson, S., Nilson, T. L., Roberts, S.P. & Gibbs, A.G. (2007) The effect of selection for desiccation resistance on cold tolerance of *Drosophila melanogaster*. *Physiological Entomology* **32**: 322-327.
117. Sinclair, B.J., Gibbs, A.G. & Roberts, S.P. (2007) Gene transcription during exposure to, and recovery from, cold and desiccation stress in *Drosophila melanogaster*. *Insect Molecular Biology* **16**: 435-443.
118. Deere, J.A., Sinclair, B.J., Marshall, D.J. & Chown, S.L. (2006) Phenotypic plasticity of thermal tolerances in five oribatid mite species from sub-Antarctic Marion Island. *Journal of Insect Physiology* **52**: 693-700.
119. Nilson, T.L., Sinclair, B.J. & Roberts, S.P. (2006) The effects of carbon dioxide anesthesia and anoxia on rapid cold-hardening and chill coma recovery in *Drosophila melanogaster*. *Journal of Insect Physiology* **52**: 1027-1033.
120. Sinclair, B.J. & Chown, S.L. (2006) Caterpillars benefit from thermal ecosystem engineering by Wandering Albatrosses on sub-Antarctic Marion Island. *Biology Letters* **2**: 51-54.
121. Sinclair, B.J. & Chown, S.L. (2006) Rapid cold-hardening in a Karoo beetle, *Afrinus* sp. *Physiological Entomology* **31**: 98-101.
122. Sinclair, B.J., Scott, M.B., Klok, C.J., Terblanche, J.S., Marshall, D.J., Reyers, B. & Chown, S.L. (2006) Determinants of terrestrial arthropod community composition at Cape Hallett, Antarctica. *Antarctic Science* **18**: 303-312.
123. Sinclair, B.J. & Stevens, M.I. (2006) Terrestrial microarthropods of Victoria Land and Queen Maud Mountains, Antarctica: implications of climate change. *Soil Biology & Biochemistry* **38**: 3158-3170.
124. Sinclair, B.J., Terblanche, J.S., Scott, M.B., Blatch, G., Klok, C.J. & Chown, S.L. (2006) Environmental physiology of three species of springtail at Cape Hallett, North Victoria Land, Antarctica. *Journal of Insect Physiology* **52**: 29-50.
125. Parr, C.L., Sinclair, B.J., Anderson, A.N., Gaston, K.J. & Chown, S.L. (2005) Constraint and competition in assemblages: a cross-continental and modelling approach for ants. *American Naturalist* **165**: 481-494.
126. Sinclair, B.J. & Chown, S.L. (2005) Deleterious effects of repeated cold exposure in a sub-Antarctic caterpillar. *Journal of Experimental Biology* **208**: 869-879.
127. Sinclair, B.J. & Chown, S.L. (2005) Climatic variability and hemispheric differences in insect cold tolerance: Support from southern Africa. *Functional Ecology* **19**: 214-221.
128. Sinclair, B.J. & Roberts, S.P. (2005) Acclimation, shock and hardening in the cold. *Journal of Thermal Biology* **30**: 557-562.
129. Terblanche, J.S., Sinclair, B.J., Klok, C.J., McFarlane, M.L. & Chown, S.L. (2005) The effects of acclimation on thermal tolerance, desiccation resistance and metabolic rate in *Chirodica chalcoptera* (Coleoptera: Chrysomelidae). *Journal of Insect Physiology* **51**: 1013-1023.

130. Chown, S.L., Sinclair, B.J., Leinaas, H.P. & Gaston, K.J. (2004) Hemispheric asymmetries in biodiversity – A serious matter for ecology. *PLoS Biology* **2**: 1701-1707.
131. Klok, C. J., Sinclair, B. J. & Chown, S.L. (2004) Upper thermal tolerance and oxygen-limitation in terrestrial arthropods. *Journal of Experimental Biology* **207**: 2361-2370.
132. Nondula, N., Marshall, D.J., Baxter, R., Sinclair, B.J. & Chown, S.L. (2004) Life history and osmoregulatory ability of *Telmatogeton amphibius* (Chironomidae) at Marion Island. *Polar Biology* **27**: 629-635.
133. Sinclair, B.J., Klok, C.J & Chown, S.L. (2004) Metabolism of the sub-Antarctic caterpillar *Pringleophaga marioni* during cooling, freezing and thawing. *Journal of Experimental Biology* **207**: 1287-1294. (Featured article)
134. Sinclair, B.J., Marshall, D.J., Singh, S., & Chown, S.L. (2004) Cold tolerance of Littorinidae from Southern Africa: Intertidal snails are not constrained to freeze tolerance. *Journal of Comparative Physiology B* **174**: 617-624.
135. Williams, C.M., Poulin, R. & Sinclair, B.J. (2004) Increased haemolymph osmolality suggests a new route for behavioural manipulation of *Talorchestia quoyana* (Amphipoda: Talitridae) by its mermithid parasite. *Functional Ecology* **18**: 685-691.
136. Sinclair, B.J., Klok, C.J., Scott, M.B., Terblanche, J.S. & Chown, S.L. (2003) Diurnal variation in supercooling points of three species of Collembola from Cape Hallett, Antarctica. *Journal of Insect Physiology* **49**: 1049-1061.
137. Sinclair, B.J., Vernon, P., Klok, C.J. & Chown, S.L. (2003) Insects at Low Temperatures: An Ecological Perspective. *Trends in Ecology and Evolution* **18**: 257-262.
138. Sinclair, B.J., Addo-Bediako, A. & Chown, S.L. (2003) Climatic variability and the evolution of insect freeze tolerance. *Biological Reviews* **78**: 181-195.
139. Sinclair, B.J. & Chown, S.L. (2003) Rapid cold hardening responses to high temperature and desiccation, but not to low temperature in the freeze tolerant sub-Antarctic caterpillar *Pringleophaga marioni* (Lepidoptera, Tineidae). *Journal of Insect Physiology* **49**: 45-52.
140. Sinclair, B.J. & Chown, S.L. (2002) Haemolymph osmolality and thermal hysteresis activity in 17 species of arthropods from sub-Antarctic Marion Island. *Polar Biology* **25**: 928-933.
141. Sinclair, B.J. (2002) Effects of increased temperatures simulating climate change on terrestrial invertebrates on Ross Island, Antarctica. *Pedobiologia* **46**: 150-160.
142. Sjursen, H. & Sinclair, B.J. (2002) On the cold hardiness of *Stereotydeus mollis* (Acari: Prostigmata) from Ross Island, Antarctica. *Pedobiologia* **46**: 188-195.
143. Sinclair, B.J. (2001) Biologically relevant environmental data: Macros to make the most of microclimate recordings. *CryoLetters* **22**: 125-134.
144. Sinclair, B.J. (2001) Field Ecology of Freeze-Tolerance: Interannual variation in cooling rates, freeze-thaw and thermal stress in the microhabitat of the alpine cockroach *Celatoblatta quinquemaculata* *Oikos* **93**: 286-293.
145. Sinclair, B.J. (2001) On the distribution of Terrestrial invertebrates at Cape Bird, Ross Island, Antarctica. *Polar Biology* **24**: 394-400.
146. Sinclair, B.J., Lord, J.M. & Thompson, C.M. (2001) Microhabitat selection and seasonality of alpine invertebrates. *Pedobiologia* **45**: 107-120.

147. Sinclair, B.J. & Sjørnsen, H. (2001) Cold tolerance of the Antarctic springtail *Gomphiocephalus hodgsoni* (Collembola: Hypogastruridae). *Antarctic Science* **13**: 271-279.
148. Sinclair, B.J. & Sjørnsen, H. (2001) Terrestrial invertebrate abundance and habitat in Keble Valley, Ross Island, Antarctica. *Pedobiologia* **45**: 134-145.
149. Sinclair, B.J. (2000) Water relations of the freeze-tolerant New Zealand alpine cockroach *Celatoblatta quinque maculata* (Dictyoptera: Blattidae). *Journal of Insect Physiology* **46**: 869-876.
150. Sinclair, B.J. (1999) Insect cold tolerance: How many kinds of frozen? *European Journal of Entomology* **96**: 157-164.
151. Sinclair, B.J., Worland, M.R., & Wharton, D.A. (1999) Ice nucleation and freezing tolerance in New Zealand alpine and lowland weta, *Hemideina* spp. (Orthoptera: Stenopelmatidae). *Physiological Entomology* **24**: 56-63.
152. Block, W., Wharton, D.A. & Sinclair, B.J. (1998) Cold tolerance of a New Zealand alpine cockroach, *Celatoblatta quinque maculata* (Dictyoptera: Blattidae). *Physiological Entomology* **23** 1-6.
153. Sinclair, B.J. (1997) Seasonal variation in freezing tolerance of the New Zealand alpine cockroach *Celatoblatta quinque maculata*. *Ecological Entomology* **22**: 462-467.
154. Sinclair, B.J. & Wharton, D.A. (1997) Avoidance of Intracellular Freezing by the New Zealand Alpine Weta *Hemideina maori* (Orthoptera: Stenopelmatidae). *Journal of Insect Physiology* **43**: 621-625.
155. Worland, M.R., Sinclair, B.J. & Wharton, D.A. (1997) Ice nucleator activity in a New Zealand alpine cockroach *Celatoblatta quinque maculata* (Dictyoptera: Blattidae). *Cryo-Letters* **18**: 327-334.

Report Contributions

- Sinclair, B.J., Coello Alvarado, L.E. & Ferguson, L.V. (2014) *Determining cold tolerance and overwintering potential of insects*. Canadian Food Inspection Agency, Ottawa, ON, Canada.
- McCarthy, J. J., Canziani, O. F., Leary, N. A., Dokken, D. J. & White, K. S. (eds). (2001). *Climate Change 2001: Impacts, Adaptations and Vulnerability*. Intergovernmental Panel on Climate Change (IPCC), Geneva. (Contributor to Chapter 16: Polar Regions (Arctic and Antarctic), edited by O. Anisimov & B. Fitzharris).
- Waterhouse, E. J. (ed.) (2001). *Ross Sea Region 2001: A State of the Environment Report for the Ross Sea Region of Antarctica*. Antarctica New Zealand, Christchurch. (Contributor to Terrestrial Biology Chapter).

Book reviews and editorial material

- Košťál, V. & Sinclair, B.J. (2017) Editorial overview: Global Change Biology – Linking pattern and process to prediction and policy. *Current Opinion in Insect Science*.
- Sinclair, B.J. (2016) Book Review: Big Questions about organisms: a review of *Integrative Organismal Biology*. *Physiological and Biochemical Zoology* **89**: 453-455.

Sinclair, B.J. (2014) Editorial overview: Insect Environmental Physiology. *Current Opinion in Insect Science*.

Sinclair, B. J. (2002). Insect Giants – Out of the Grey. Review of: Field, L. (ed.) 2001. *The Biology of Wetas, King Crickets and their Allies*, CABI, Oxford. *New Zealand Journal of Ecology* **26**: 91-92.

Book Chapter

Chown, S.L. & Sinclair, B.J. (2010). The Macrophysiology of insect thermal limits. Pp. 191-223
In: Denlinger, D.L. and Lee, R.E., eds. Insect Low Temperature Biology. Cambridge University Press.

Invited Seminars (since 2008 shown)

Sinclair, B.J. (2019) Introducing *Gryllus veletis* as a model for insect freeze tolerance

Department of Biology, University of the Pacific, Stockton, CA, USA

Department of Integrative Biology, University of California at Berkeley, CA, USA

Department of Biology, McMaster University, Hamilton, ON, Canada

(2020) Department of Zoology, University of British Columbia, Vancouver, BC, Canada

Sinclair, B.J. (2020) Overwintering physiology and survival of spotted wing *Drosophila*. Lower Mainland Horticulture Improvement Association Berry Growers' Short Course, Pacific Agricultural Show, Abbotsford, BC, Canada

Sinclair, B.J. (2019) Fluctuating thermal regimes: Engineering inertia vs biological advantage.

International Atomic Energy Agency Cooperative Improved Field Performance of Sterile Male Lepidoptera to Ensure Success in SIT Programmes, second Research Coordination Meeting, Mendoza, Argentina. (By teleconference)

Sinclair, B.J. (2018) Help! There's -omics in my comparative physiology!

College of Bee Sciences, Fujian Agricultural and Forestry University, Fuzhou, China

State Key Laboratory of Marine Environmental Science, Xiamen University, Xiamen, China

(2019) Department of Biology, University of Colorado Denver, Denver, CO, USA

(2019) Department of Organismal and Evolutionary Biology, Colorado College, Colorado Springs, CO, USA

(2019) Department of Conservation Biology and Entomology, Stellenbosch University, South Africa

Sinclair, B.J. (2018) Strategies for Systematically exploring plasticity, limits, and performance of lab-reared insects. International Atomic Energy Agency Cooperative Improved Field Performance of Sterile Male Lepidoptera to Ensure Success in SIT Programmes, second Research Coordination Meeting, Palmerston North, New Zealand.

Sinclair, B.J. (2018) How and Why did insects evolve freeze tolerance?

Dept. of Biological Sciences, Bowling Green State University, Bowling Green, OH, USA

Institute for Agriculture and the Environment, Massey University, Palmerston North, New Zealand.

- Department of Entomology, University of Kentucky, Lexington, KY, USA
- Sinclair, B.J. (2017) Five strategies for effective estimates of insect cold tolerance and detection of diapause. Symposium: Molecular mechanisms underlying insect diapause and cold tolerance. Entomological Society of Canada Annual Meeting, Winnipeg, MB, Canada.
- Sinclair, B.J. (2017) On categories and kinds in insect cold tolerance: 'How many kinds of frozen' revisited. Opening Plenary, 7th International Symposium on the Environmental Physiology of Ectotherms and Plants, Tartu, Estonia.
- Sinclair, B.J., Toxopeus, J. & Košťál, V. (2017) Progress in understanding freeze tolerance and metabolic suppression in dormant insects. International Atomic Energy Agency Cooperative Research Program on Dormancy and insect mass rearing, third Research Coordination Meeting, Vienna, Austria.
- Sinclair, B.J. (2017) The many roles of fat in overwintering insects. Journal of Experimental Biology Symposium: The Biology of Fat. Wiston House, UK.
- Sinclair, B.J. (2017) Insect acclimation to cold: Mechanisms from molecular to microbiomic. Dept. Biology, University of Waterloo, Waterloo, ON, Canada.
Department of Biology, Clemson University, Clemson, SC, USA.
School of BioSciences, University of Birmingham, Birmingham, UK.
- Sinclair, B.J. (2016) Waking up from the cold: Mechanisms underlying chill coma recovery and implications for process optimisation. International Atomic Energy Agency Cooperative Improved Field Performance of Sterile Male Lepidoptera to Ensure Success in SIT Programmes, first Research Coordination Meeting, Durban, South Africa.
- Sinclair, B.J. (2016) Insect Freeze Tolerance: Lessons from Nature. NIH workshop on Cryopreservation of *Drosophila*. Orlando, FL.
- Sinclair, B.J., Jiménez Padilla, Y. & Ferguson, L.V. (2016) Immunity and symbiosis in the cold. International Atomic Energy Agency Cooperative Research Project on Dormancy and insect mass rearing, second Research Coordination Meeting, Stellenbosch, South Africa.
- Sinclair, B.J. (2015) Winter is complicated: How overwintering mediates insect responses to a changing world.
Department of Biological Sciences, Queen's University, Kingston, ON, Canada
(2016) Department of Biology, McMaster University, Hamilton, ON, Canada
(2016) Department of Biology, Case Western Reserve University, Cleveland, OH, USA
(2016) Institute of Entomology, Czech Academy of Sciences, Český Budejovice, Czech Republic
(2016) Department of Biology, York University, Toronto, ON, Canada
(2016) Great Lakes Forestry Centre, Natural Resources Canada, Sault Ste. Marie, ON, Canada
(2017) Department of Biology, University of Eastern Finland, Joensuu, Finland
- Sinclair, B.J. (2015) What would happen if we used physiological tolerances to design protected areas? Implications of politics and climate change for conservation planning. Society for Integrative and Comparative Biology symposium 'Physiology in changing landscapes'. West Palm Beach, FL, USA.

- Sinclair, B.J. (2014) Tropical ectotherms are more susceptible to climate change: an introduction to prevailing paradigms. Opening plenary, Gastropod thermal biology and climate change in the tropics workshop, Brunei Darussalam.
- Sinclair, B.J. (2014) Have thermocouple, will travel: global adventures in insect physiology. Plenary lecture, Entomological Society of Ontario Annual Meeting.
- Sinclair, B.J. (2014) New approaches to understanding insect freeze tolerance. International Atomic Energy Agency Cooperative Research Project on Dormancy and insect mass rearing, first Research Coordination Meeting, Vienna, Austria.
- Sinclair, B.J. (2014) Linking energetics and overwintering in temperate insects. Society for Experimental Biology Annual Meeting, Manchester, UK. (Presentation sponsored by *Journal of Thermal Biology*).
- Sinclair, B.J. (2014) Caveats and compromises in interpreting insect cold tolerance for Pest Risk Assessment. Canadian Food Inspection Agency Plant Research Seminar Series. (Webinar with >100 participants from federal agencies across Canada).
- Sinclair, B.J. (2014) Icy insects: the mechanisms and evolution of being frozen solid.
 Department of Biology, University of Ottawa, Ottawa, ON, Canada
 Department of Biological Sciences, University of Manitoba, Winnipeg, MB, Canada
 Biological Sciences, University of Windsor, Windsor, ON, Canada
 Biological Sciences, University of Notre Dame, IN, USA
 (2015) Department of Biology, University of British Columbia-Okanagan, Kelowna, BC, Canada
 (2015) Department of Biology, Université de Québec à Rimouski, Rimouski, QC, Canada
 (2015) Department of Zoophysiology, Aarhus University, Denmark
- Sinclair, B.J. (2013) Cross-tolerance and cross-talk in the cold: relationships between low temperatures and other stressors in insects.
 Society for Integrative and Comparative Biology symposium 'Physiological responses to simultaneous shifts in multiple environmental stressors'. San Francisco, CA, USA.
- Sinclair, B.J. (2013) Why do insects stop moving in the cold?
 Anatomy Department, University of Otago, Dunedin, New Zealand
 Biology Department, Kansas State University, Manhattan, KS, USA
- Sinclair, B.J. (2012) What mechanisms underlie variation in insect low temperature performance?
 School of Environmental Sciences, University of Guelph, Guelph, ON, Canada
 European Science Foundation ThermAdapt workshop, Sitges, Spain
- Sinclair, B.J. (2012) Burning while frozen: Ectotherm energy use in changing winters.
 Department of Biology, University of Florida, Gainesville, FL, USA
 Department of Biology, Central Michigan University, Mt. Pleasant, MI, USA
 Department of Biology, University of Toronto at Mississauga, Mississauga, ON, Canada
 School of Biological Sciences, University of Auckland, New Zealand
 Department of Zoology, University of Otago, New Zealand
 Ecology & Evolutionary Biology, University of Toronto main campus
 (2013) Department of Biology, Universiti Brunei Darussalam, Brunei

- Sinclair, B.J. (2011) It's not about the ice: mechanisms underlying chilling injury in insects.
 Department of Zoology, University of Otago, New Zealand.
 Department of Biological Sciences, Southern Illinois University at Edwardsville, IL, USA.
 Department of Zoology and Physiology, University of Wyoming, Laramie, WY, USA.
 Plenary lecture, ISEPEP4, Rennes, France
 (2012) Department of Entomology, University of Florida, Gainesville, FL, USA
- Sinclair, B.J. (2010) Cold snaps, warm spells and the effects of climate on overwintering insects.
 Boutilier award lecture (Plenary), Canadian Society of Zoologists annual meeting, Vancouver, BC, Canada.
- Sinclair, B.J. (2009) From the bottom up: Extending laboratory studies of cold tolerance to large-scale models.
 Entomological Society of America annual meeting symposium 'Cold Case Files', Indianapolis, IN, USA
- Sinclair, B.J. (2009) What happens when insects freeze and thaw (and freeze and thaw, and freeze and thaw)?
 Biology Department, Trent University, Peterborough, ON, Canada
 Department of Zoology, Miami University, Oxford, OH, USA
 Department of Entomology, Ohio State University, Columbus, OH, USA
 Institute for Low Temperature Science, Hokkaido University, Sapporo, Japan
 Department of Zoology, University of British Columbia, Vancouver, BC, Canada
- Sinclair, B.J. (2008) *Drosophila melanogaster*: A non-cold-tolerant model for insect cold tolerance.
 Plenary Lecture, Insect Biotechnology Conference, St Catharine's, Ontario.
- Sinclair, B.J. (2008) The fly that went into the cold: *Drosophila melanogaster* at low temperatures.
 Department of Biological Sciences, Brock University, St Catharine's, ON, Canada
 Origins Institute, McMaster University, Hamilton, ON, Canada
 Department of Biology, University of Ottawa, Ottawa, ON, Canada
 Department of Biology, University of Toronto at Mississauga, Mississauga, ON, Canada

Selected Conference Presentations and Posters

(since 2015 shown, including only presentations by myself and immediate lab members,
Underlined = presenting author, *asterisk marks poster presentations, **bold** = HQP from my laboratory.)

- Turnbull, K.F.**, Devitt, J., Najar-Rodriguez, A. & Sinclair, B.J. 2018. How does oxygen availability determine fumigation success? Entomological Society of Ontario Annual Meeting, Bark Lake, ON, Canada.
- Torson, A.S.**, Doucet, D., Roe, A.D. & Sinclair, B.J. 2018. Does chilling elicit metabolomic changes in Asian Longhorned Beetle larvae? Entomological Society of Ontario Annual Meeting, Bark Lake, ON, Canada.

- Jiménez Padilla, Y.**, Ferguson, L.V. & Sinclair, B.J. Comparing apples and oranges: fruit type affects *Drosophila suzukii* development time and cold tolerance. Entomological Society of Ontario Annual Meeting, Bark Lake, ON, Canada.
- Anthony, S.E.**, Scott, C.E. & Sinclair, B.J. 2018. Relating performance to fitness in Western black widow spiders (*Latrodectus hesperus*). Entomological Society of Ontario Annual Meeting, Bark Lake, ON, Canada.
- Ciancio, J.J.**, Sinclair, B.J., Garipey, T.D. 2018. Overwintering biology of the brown marmorated stink bug, *Halyomorpha halys*. Entomological Society of Ontario Annual Meeting, Bark Lake, ON, Canada.
- *Lebenzon, J.E.**, Toxopeus, J., Anthony, S.E. & Sinclair, B.J. 2018. Not just another cute chelicerate: *De novo* assembly of the Beringean pseudoscorpion (*Wyochernes asiaticus*) transcriptome reveals putative venom proteins. Entomological Society of Ontario Annual Meeting, Bark Lake, ON, Canada.
- Anthony, S.E.**, Buddle, C.M., Høye, T.T. Hein, N., Beckers, N. & Sinclair, B.J. 2018. Thermal limits of spiders, mites, and pseudoscorpions from Arctic and temperate habitats. Canadian Society of Zoologists annual meeting, St. Johns, NL, Canada.
- Toxopeus, J.**, Des Marteaux, L.E., Košťál, V. & Sinclair, B.J. 2018. Do cryoprotectants really protect against cold? An experimental evaluation of insect freeze tolerance. Canadian Society of Zoologists annual meeting, St. Johns, NL, Canada.
- Lebenzon, J.E.** & Sinclair, B.J. 2018. Some like it cold: the functional role of heat shock proteins in cold tolerance and diapause of the Colorado Potato Beetle. Canadian Society of Zoologists annual meeting, St. Johns, NL, Canada.
- Sinclair, B.J.** & **Toxopeus, J.** 2018. New directions in insect freeze tolerance. Canadian Society of Zoologists annual meeting, St. Johns, NL, Canada.
- *Anthony, S.E.**, Buddle, C.M., Høye, T.T., Hein, N., Beckers, N. & Sinclair, B.J. 2018. Thermal limits of spiders, mites, and pseudoscorpions from Arctic and temperate habitats. Society for Integrative and Comparative Biology Annual Meeting, San Francisco, CA, USA.
- *Jiménez Padilla, Y.**, Lachance, M.-A. & Sinclair, B.J. 2018. Live yeasts determine development time in *Drosophila melanogaster*. Society for Integrative and Comparative Biology Annual Meeting, San Francisco, CA, USA.
- Toxopeus, J.**, **Des Marteaux, L.E.**, Košťál, V. & Sinclair, B.J. 2018. Why frozen insects die: a tale of metabolomics, transcriptomics, and cryoprotectant manipulation in freeze-tolerant crickets. Society for Integrative and Comparative Biology Annual Meeting, San Francisco, CA, USA.
- Sinclair, B.J. Applied comparative physiology: Finding the utility in freezing bugs. Society for Integrative and Comparative Biology Annual Meeting, San Francisco, CA, USA.

- ***Torson, A.**, Martin, D., Crispell, S., Zhang, M.L., **Mohammad, L.**, **Smith, A.J.**, Sinclair, B.J., Roe, A.D. 2017. You are what your mother eats: Maternal rearing condition impacts future larval growth trajectory in Asian Longhorned Beetle. Entomological Society of Canada Annual Meeting, Winnipeg, MB, Canada
- ***Ciancio, J.J.**, Sinclair, B.J., & Sinclair, B.J. 2017. The effect of environmental stressors on brown marmorated stink bug (*Halyomorpha halys*) overwintering physiology. Entomological Society of Ontario, Guelph, ON, Canada. Entomological Society of Canada, Winnipeg, MB, Canada.
- ***Turnbull, K.F.**, McNeil, J.N., & Sinclair, B.J. 2017. Energetics of overwintering in the soil in the western bean cutworm, *Striacosta albicosta*. Entomological Society of Ontario, Guelph, ON, Canada. Entomological Society of Canada, Winnipeg, MB, Canada.
- Jiménez Padilla, Y.**, Lachance, M.-A. & Sinclair, B.J. 2017. Live yeasts determine development time in *Drosophila melanogaster*. Entomological Society of Ontario, Guelph, ON, Canada.
- Toxopeus, J.**, Košťál, V. & Sinclair, B.J. 2017. Manipulating the transcriptome and metabolome of the spring field cricket, *Gryllus veletis*: insights into freeze tolerance. 7th International Symposium on the Environmental Physiology of Ectotherms and Plants (ISEPEP7), Tartu, Estonia.
- Des Marteaux, L.E.** & Sinclair, B.J. 2017. Cold Acclimation in a chill-susceptible field cricket: effects on structure and active transport function in ionoregulatory tissues. ISEPEP7, Tartu, Estonia.
- Lebenzon, J.E.**, **Turnbull, K.F.**, Mathers, K.E., Staples, J.F. & Sinclair, B.J. 2017. Mitophagy drives metabolic suppression during diapause in the Colorado potato beetle (*Leptinotarsa decemlineata*). ISEPEP7, Tartu, Estonia.
- Jiménez Padilla, Y.**, Lachance, M.-A. & Sinclair, B.J. 2017. The role of gut yeasts in insect thermal biology. Canadian Society of Zoologists' Annual Meeting, Winnipeg, MB, Canada
- ***Lebenzon, J.E.**, **Turnbull, K.F.**, Mathers, K.E., Staples, J.F. & Sinclair, B.J. 2017. Let's break it down: Mitophagy as a mechanism for metabolic suppression during diapause in the Colorado potato beetle. Canadian Society of Zoologists' Annual Meeting, Winnipeg, MB, Canada. (Battle Prize for best student poster).
- Toxopeus, J.**, Košťál, V. & Sinclair, B.J. 2017. Functional assessment of cryoprotectants in the freeze-tolerant spring field cricket, *Gryllus veletis*. Canadian Society of Zoologists' Annual Meeting, Winnipeg, MB, Canada
- ***Anthony, S.E.** & Sinclair, B.J. 2017. Mite-y Freeze Tolerant. Canadian Society of Zoologists' Annual Meeting, Winnipeg, MB, Canada

- ***Kaunisto, S., Ferguson, L.V.** & Sinclair, B.J. 2017. Can we predict the impacts of multiple stressors on insects in a changing climate? Society for Integrative and Comparative Biology annual meeting, New Orleans, LA, USA.
- ***Toxopeus, J.**, Košťál, V. & Sinclair, B.J. 2017. Metabolomics and transcriptomics of freeze tolerance acclimation in the spring field cricket, *Gryllus veletis*. Society for Integrative and Comparative Biology annual meeting, New Orleans, LA, USA.
- Ferguson, L.V.**, Dhakal, P., Bucking, C. & Sinclair, B.J. Cold “colon”-ization: seasonal changes in the gut microbiome of the spring field cricket, *Gryllus veletis*. Society for Integrative and Comparative Biology annual meeting, New Orleans, LA, USA.
- Jiménez Padilla, Y.**, Lachance, A. and **Sinclair, B.J.** 2016. The gut yeast microbiota determines insect recovery from chill coma. Society for Integrative and Comparative Biology annual meeting, New Orleans, LA, USA.
- Des Marteaux, L.E.** & Sinclair, B.J. 2016. Effects of cold acclimation on structure and transport function in insect ionoregulatory tissues. Entomological Society of Ontario Annual Meeting, Sault Ste Marie, ON, Canada
- ***Turnbull, K.F.**, McNeil, J.N. and Sinclair, B.J. 2016. Overwintering energetics and microhabitat selection in the western bean cutworm. ESO annual meeting.
- Jiménez Padilla, Y.**, Lachance, A. and Sinclair, B.J. 2016. Effect of gut-associated yeasts on *Drosophila melanogaster* performance. ESO Annual meeting.
- Ferguson, L.V.** and Sinclair, B.J. 2016. Insect eco-immunology in the cold: How will biotic interactions at low temperatures shape success in a warming world? XXV International Congress of Entomology, Orlando, FL, United States
- Des Marteaux, L.E.** and Sinclair, B.J. 2016. Effects of cold acclimation on structure and transport function in insect ionoregulatory tissues (or, everything you always wanted to know about cricket rectums but were afraid to ask). XXV International Congress of Entomology
- Sinclair, B.J. 2016. Climate change and overwintering insects: Energy, cold, and immunity. XXV International Congress of Entomology.
- ***Lebenzon, J.E.** & Sinclair, B.J. 2016. Interference in the cold: manipulating cryoprotectants to investigate cold tolerance in the Colorado potato beetle. Canadian Society of Zoologists’ annual meeting, London, ON, Canada.
- ***Kaunisto, S., Ferguson, L.V.** & Sinclair, B.J. 2016. Can we predict the effects of multiple stressors? CSZ annual meeting.
- ***Toxopeus, J.**, Košťál, V. & Sinclair, B.J. 2016. Crickets on ice: Dissecting the mechanisms underlying insect freeze tolerance. CSZ Annual meeting.

- *Turnbull, K.F.**, McNeil, J.N. & Sinclair, B.J. 2016. Does microhabitat, phenology, and metabolic plasticity reduce overwintering energy use in the western bean cutworm? CSZ Annual meeting. (Holeton Prize for best comparative physiology poster)
- Anthony, S.E.**, Buddle, C.M. & Sinclair, B.J. 2016. The spider who came in from the cold: Variability and plasticity of spider thermal biology. CSZ Annual Meeting.
- Des Marteaux, L.E.** & Sinclair, B.J. 2016. Effects of cold acclimation on structure and transport function in insect ionoregulatory tissues. CSZ Annual meeting (Hoar award finalist).
- Ferguson, L.V., Salehipour-shirazi, G.** & Sinclair, B.J. 2016. How do pathogens and immunity shape insect success at low temperatures? CSZ Annual meeting. (Hoar award finalist).
- Sinclair, B.J., Salehipour-shirazi, G. & Ferguson, L.V.** 2015. Thermal biology of insect immunity. SICB annual meeting, Portland, OR, USA.
- Marshall, K.E.**, Harley, C.D.G. & Sinclair, B.J. 2015. Integrating the effects of repeated cold exposure from transcriptome to species distribution in the eastern spruce budworm. SICB annual meeting, Portland, OR, USA.
- Des Marteaux, L.E.** & Sinclair, B.J. 2015. How does cold acclimation affect ion transport and ultrastructure of the insect hindgut? Entomological Society of Canada Annual Meeting, Montreal, Quebec, Canada.
- Sinclair, B.J., Toxopeus, J., Jakobs, R., Ferguson, L.V. & Garipey, T.D.** 2015. Dissecting the winter morph of *Drosophila suzukii*. Entomological Society of Canada Annual Meeting, Montreal, Quebec, Canada.
- Jakobs, R.**, Garipey, T.D. & Sinclair, B.J. 2015. Chillin' in Ontario – Plasticity of cold tolerance in adult *Drosophila suzukii*. Sixth International Symposium on the Environmental Physiology of Ectotherms and Plants, Aarhus, Denmark.
- Des Marteaux, L.E.** & Sinclair, B.J. 2015. How does cold acclimation affect ion transport, gene expression, and ultrastructure of the insect hindgut? Sixth International Symposium on the Environmental Physiology of Ectotherms and Plants, Aarhus, Denmark.
- Sinclair, B.J., Salehipour-shirazi, G. & Ferguson, L.V.** 2015. Thermal biology of insect immunity. Sixth International Symposium on the Environmental Physiology of Ectotherms and Plants, Aarhus, Denmark.
- *Toxopeus, J., Jakobs, R., Ferguson, L.V., Garipey, T.D. & Sinclair, B.J.** 2015. Reproductive diapause alters stress tolerance in *Drosophila suzukii*. Canadian Society of Zoologists annual meeting, Calgary, AB, Canada.
Sixth International Symposium on the Environmental Physiology of Ectotherms and Plants, Aarhus, Denmark.

Anthony, S.E. & Sinclair, B.J. 2015. Cold tolerance of the invasive isopod *Oniscus asellus* in Southwestern Ontario. Canadian Society of Zoologists annual meeting, Calgary, AB, Canada.

Ferguson, L.V. & Sinclair, B.J. 2015. Plasticity drives thermal dependency of host-pathogen interactions. Canadian Society of Zoologists annual meeting, Calgary, AB, Canada.

Sinclair, B.J. & King, K.J. 2015. Waterproof on the inside and out: Role of cuticular melanism and lipids in water loss rates of insects. Canadian Society of Zoologists annual meeting, Calgary, AB, Canada.

***Lebenzon, J., Des Marteaux, L.E.,** & Sinclair, B.J. 2015. Pass the salt: Sodium gut loading enhances cold tolerance in the fall field cricket. Canadian Society of Zoologists annual meeting, Calgary, AB, Canada.

McKinnon, A.H. & Sinclair, B.J. 2015. A new model for cool: Inducing freeze tolerance in the spring field cricket, *Gryllus veletis*. Canadian Society of Zoologists annual meeting, Calgary, AB, Canada.

Ferguson, L.V., Heinrichs, D.E. & Sinclair, B.J. 2015 What is acclimation good for? Conflicting responses of physiological and immune systems in the cold. Society for Integrative and Comparative Biology Annual Meeting, West Palm Beach, FL, USA.