

Ben J. G. Sutherland

Postdoctoral Fellow

Institut de Biologie Intégrative et des Systèmes (IBIS), Département de biologie,
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ACADEMIC POSITIONS

2014-present Postdoctoral Researcher at Université Laval, Québec, QC, Canada

EDUCATION

2008-2014 Ph.D. Biology, University of Victoria, Victoria BC Canada
2004-2008 Bachelor Sciences (honours), Biology, Thompson Rivers University, Kamloops,
BC, Canada

FELLOWSHIPS

2016 Postdoctoral Fellowship Fonds de recherche Santé Québec (\$30,000 over 1 yr; *renewal*)
2014 Postdoctoral Fellowship (NSERC) (\$90,000 over 2 yr)
2014 Postdoctoral Fellowship Fonds de recherche Santé Québec (\$60,000 over 2 yr) -*declined*
2012 Alexander Graham Bell Canadian Graduate Scholarship (NSERC) (\$70,000 over 2 yr)
2008 Graduate Fellowship, University of Victoria (\$52,000 over 4yr)

AWARDS & SCHOLARSHIPS

2014 Best student oral presentation at Sea Lice 2014, Portland, Maine
2012 UVic President's Research Scholarship (\$4,000)
2011 Bob Wright Graduate Scholarship (\$11,500)
2011 Maureen De Burgh Memorial Scholarship (\$412)
2011 B&C Food Distributors Graduate Scholarship (\$1,500)
2010 Best Poster, Simon Fraser University, Ecol. and Evol. Ethology of Fishes (\$350)
2008 W. Gordon Fields Memorial Fellowship (\$1,450)

PUBLICATIONS

In Review and/or Preprints:

Braden LM, **Sutherland BJG**, Koop BF and Jones SRM (*submitted*). Enhanced fitness in the Pacific salmon louse *Lepeophtheirus salmonis* to the non-native host, Atlantic Salmon *Salmo salar*.

Poley JD, **Sutherland BJG**, Jones SRM, Koop BF and Fast MD (*in revision*). Sex-biased gene expression and sequence conservation in Atlantic and Pacific salmon lice *Lepeophtheirus salmonis*. *In revision at BMC Genomics* (submitted 2015-10-26).

Sutherland B.J.G., Gosselin T, Normandeau E, Lamothe M, Isabel N, Audet C, Bernatchez L (2016) Novel method for comparing RADseq linkage maps reveals chromosome evolution in salmonids. *In Review at Genome Biology and Evolution*. BioRxiv preprint: 10.1101/039164

Peer-reviewed journal articles:

9. Müller A, **Sutherland B.J.G.**, Koop BF, Johnson SC, Garver KA (2015) Infectious hematopoietic necrosis virus (IHNV) persistence in Sockeye Salmon: influence on brain transcriptome and subsequent response to the viral mimic poly(I:C). *BMC Genomics* **16**, 634.
8. **Sutherland B.J.G.**, Poley JD, Igboeli OO, Jantzen JR, Fast MD, Koop BF, Jones SRM (2015) Transcriptomic responses to emamectin benzoate in Pacific and Atlantic Canada salmon lice *Lepeophtheirus salmonis* with differing levels of drug resistance. *Evolutionary Applications* **8**(2), 133-148.
7. **Sutherland B.J.G.**, Koczka KW, Yasuike M, Jantzen SG, Yazawa R, Koop BF, Jones SRM (2014) Comparative transcriptomics of Atlantic *Salmo salar*, chum *Oncorhynchus keta* and pink salmon *O. gorbuscha* during infections with salmon lice *Lepeophtheirus salmonis*. *BMC Genomics* **200**, 15.
6. **Sutherland B.J.G.**, Hansen K, Jantzen JR, Koop BF, Smith, CR (2014) Divergent immunity and energetic programs in the gills of migratory and resident *Oncorhynchus mykiss*. *Molecular Ecology* **23**(8), 1952-1964.
5. Sahlmann C, **Sutherland B.J.G.**, Kortner TM, Koop BF, Krogdahl A, Bakke AM (2013) Early response of gene expression in the distal intestine of Atlantic salmon (*Salmo salar* L.) during the development of soybean meal induced enteritis. *Fish & Shellfish Immunology* **34**(2), 599-609.
4. **Sutherland B.J.G.**, Jantzen SG, Yasuike M, Sanderson DS, Koop BF, Jones SRM (2012) Transcriptomics of coping strategies in free-swimming *Lepeophtheirus salmonis* (Copepoda) larvae responding to abiotic stress. *Molecular Ecology* **21**(24), 6000-6014.
3. Jantzen SG*, **Sutherland B.J.G.***, Minkley DR, Koop BF (2011) GO Trimming: Systematically reducing redundancy in large Gene Ontology datasets. *BMC Research Notes* **4**, 267.
2. Pavey SA, **Sutherland B.J.G.**, Leong J, Robb A, von Schalburg K, Hamon T, Koop B and Nielsen J (2011) Ecological transcriptomics of lake-type and riverine sockeye salmon (*Oncorhynchus nerka*). *BMC Ecology* **11**, 31.
1. **Sutherland B.J.G.**, Jantzen SG, Sanderson DS, Koop BF, Jones SRM (2011) Differentiating size-dependent responses of juvenile pink salmon (*Oncorhynchus gorbuscha*) to sea lice (*Lepeophtheirus salmonis*) infections. *Comparative Biochemistry and Physiology D-Genomics & Proteomics* **6**(2), 213-223.

INVITED & CONTRIBUTED PRESENTATIONS (*presenting author)

Invited presentations:

2015 & 2016 **B.J.G. Sutherland***, S.R.M. Jones and B.F. Koop. Context-dependent interactions: salmon and salmon lice. *Guest lecturer* for Prof. J. Brodeur's Parasitology course at University of Montréal, Montréal, Québec, Canada.

- 2014 **B.J.G. Sutherland***. “Comparative transcriptomics in salmonids and their parasites: predictive smoltification markers and drug resistance traits.” Seminar for University of Prince Edward Island, Charlottetown, PEI, Canada.
- 2014 D.R. Minkley* and **B.J.G. Sutherland***. “There’s something fishy about this genome!” Oral (Pecha Kucha-style) presentation for students and public at the Centre for Biomedical Research, Pecha Kucha Biomedica. Victoria, BC, Canada.
- 2013 B.F. Koop and **B.J.G. Sutherland***. “Genomics in lice and salmon (GiLS) project provides new tools and mechanisms for understanding louse biology.” Oral presentation at World Aquaculture. Nashville, Tennessee, USA. *Multimedia available at:* http://aquacomgroup.com/Page_sections/Multimedia/Sea_Lice_AA2013/Sea_Lice_AA2013_main.html
- 2013 **B.J.G. Sutherland***. “Sea lice and salmon – using gene expression to understand parasite stress and host susceptibility.” Oral presentation for the Trainees in Biomedical Research Seminar Series. Victoria, BC, Canada
- 2011 **B.J.G. Sutherland***. “Comparative susceptibilities.” Oral presentation for Managing for Uncertainty: Pathogens and Diseases in Pacific Salmon Invitational Scientists’ Think Tank. Vancouver, BC, Canada
- 2010 **B.J.G. Sutherland***, S.G. Jantzen, J. Leong, S.R.M. Jones and B.F. Koop. “*L. salmonis* and Pacific salmon – Interactions, Sensitivities and Tools.” Oral presentation for Microtek International (Pfizer). Victoria, BC, Canada
- Contributed presentations and posters:*
- 2016 Normandeau E*, **Sutherland BJG**, and Bernatchez L. Easily compare genetic maps with MapComp. Oral presentation and tutorial at the IBIS Club Bioinfo series, Université Laval, Québec, QC, Canada (in French).
- 2016 **Sutherland BJG***, Gosselin T, Normandeau E, Lamothe M, Isabel N, Audet C and Bernatchez L. Novel method for comparing RADseq linkage maps reveals chromosome evolution in salmonids. Oral presentation at the Interlabs-IBIS seminar series, Université Laval, Québec, QC, Canada.
- 2015 **Sutherland BJG***, Gosselin T, Normandeau E, Lamothe M, Isabel N, Audet C and Bernatchez L. L’application de la carte génétique haute densité pour l’analyses des caractères quantitatifs du phénotype et de l’expression chez l’omble de fontaine, *Salvelinus fontinalis*. Oral presentation at annual general meeting of the Ressources Aquatic Québec (RAQ), Québec, QC, Canada. Nov. 10-11. (in French).
- 2015 **B.J.G. Sutherland**, T. Gosselin, E. Normandeau, S.A. Pavay, L. Letourneau, M. Lamothe, N. Isabel, C. Audet and L. Bernatchez. High-density genetic map, phenotypic and (co)expression QTL analysis, and first draft genome assembly of the pseudotetraploid Brook Charr *Salvelinus fontinalis*. Poster presentation at Evolutionary and Ecological Genomics (Gordon Research Conference), Maine, USA.
- 2015 J.D. Poley*, **B.J.G. Sutherland**, K. Fitzpatrick, S.K. Whyte, O.O. Igboeli, S.L. Purcell, B.F. Koop, M.D. Fast. Basal gene expression differences between free-floating copepodids and parasitic pre-adult sea lice provides insight on development. Oral presentation at Institutional Sea Lice Conference, Charlottetown, PEI, Canada.
- 2015 J.D. Poley*, **B.J.G. Sutherland**, B.F. Koop, M.D. Fast. A novel multi-drug assay shows distinct sea lice *Lepeophtheirus salmonis* responses to emamectin benzoate and cypermethrin. Oral presentation at the 40th Eastern Fish Health Conference, South Carolina, USA.

- 2015 L.M. Braden*, **B.J.G. Sutherland**, S.R.M. Jones. Susceptibility to infection by the salmon louse is related to both host and parasite responses. Host-Microbe Interaction Workshop at Plant and Animal Genomics (PAG) XXIII, San Diego, California, USA.
- 2014 A. Müller*, **B.J.G. Sutherland**, B.F. Koop, S.C. Johnson, K.A. Garver. Characterization of the Infectious Hematopoietic Necrosis Virus (IHNV) Carrier State in Sockeye Salmon (*Oncorhynchus nerka*). Poster presentation at Genomics: the Power and the Promise (Genome Canada), Ottawa, Ontario, Canada. Abstract: *Genome*, 57(7): 386-387.
- 2014 L.M. Braden*, **B.J.G. Sutherland**, D.R. Minkley, B.F. Koop, S.R.M. Jones. Host-specific virulence by the sea louse, *Lepeophtheirus salmonis*. Poster presentation at Genomics: the Power and the Promise (Genome Canada) 2014, Ottawa, Ontario, Canada.
- 2014 **B.J.G. Sutherland***, J.D Poley, O.O. Igboeli, J.R. Jantzen, M.D. Fast, B.F. Koop, S.R.M. Jones. Transcriptomics of emamectin benzoate responses in resistant Atlantic and sensitive Pacific salmon lice *Lepeophtheirus salmonis*. Oral presentation at Sea lice 2014, Portland, Maine, U.S.A. (*best student oral presentation*).
- 2014 **B.J.G. Sutherland***, K.C. Hanson, J.R. Jantzen, B.F. Koop, C.T. Smith. Divergent immunity and energetic programs in the gills of migratory and resident *Oncorhynchus mykiss*. Oral presentation at the American Fisheries Society meeting, Québec, QC, Canada, and as part of the Interlabs-IBIS seminar series, Université Laval (invited).
- 2014 S.R.M. Jones*, **B.J.G. Sutherland**, L.M. Braden and B.F. Koop. “Salmon – louse interactions: genomics and the evolution of the inflammation paradigm.” Invited oral presentation at the 2nd International Conference for Integrative Salmonid Biology. Vancouver, BC, Canada.
- 2014 J.D Poley, **B.J.G Sutherland**, S.K. Whyte, O.O. Igboeli, S.L. Purcell, B.F. Koop, M.D. Fast*. Male lice are from Venus, Female lice are from Mars: Don’t get me started on immature life stages. Aquaculture Association of Canada (oral).
- 2014 J.D. Poley*, **B.J.G. Sutherland**, S.K. Whyte, O.O. Igboeli, S.L. Purcell, K. Fitzpatrick, B.F. Koop, M.D. Fast. Transcriptomic responses of copepodid sea lice (*Lepeophtheirus salmonis*) exposed to commonly used therapeutants in aquaculture. Oral presentation at Eastern Fish Health Workshop Meeting, Shepperdstown, West Virginia, USA & CSZ-CSEE-SCL First Joint Conference, Montréal, Quebec, Canada.
- 2014 **B.J.G. Sutherland***. “Living like a louse: Evading salmon defenses, chemical treatments and environmental stressors.” Biology Departmental Seminar for the University of Victoria, Victoria, B.C. Canada.
- 2013 S.R.M. Jones*, **B.J.G. Sutherland**, L.M. Braden and B.F. Koop. Parasitological, physiological and molecular metrics of resistance to *Lepeophtheirus salmonis* among salmon. Oral presentation at the 16th International Conference on Diseases of Finfish and Shellfish. Tampere, Finland.
- 2013 M.D. Fast,* J.D. Poley, O.O. Igboeli, **B.J.G. Sutherland**, B.F. Koop, S.L. Purcell, J.M. Covello, J.F. Burka, S. Whyte (2013). There and back again: Managing sea lice infection and resistance to treatment. Poster presentation at the 16th International Conference on Diseases of Fish and Shellfish. Tampere, Finland.
- 2013 A. Müller, K.A. Garver, **B.J.G. Sutherland**, B.F. Koop and S.C. Johnson*. “Characterization of the infectious hematopoietic necrosis virus (IHNV) carrier state in sockeye salmon (*Oncorhynchus nerka*). Oral presentation at The 1st Conference of the International Society of Fish and Shellfish Immunology. Vigo, Spain

- 2012 **B.J.G. Sutherland***, K.W. Koczka, S.R.M. Jones and B.F. Koop. Early responses of three salmonid species to *Lepeophtheirus salmonis* (Copepoda) infections.” Oral presentation at the 1st International Conference for Integrative Salmonid Biology. Oslo, Norway
- 2012 S.R.M. Jones*, **B.J.G. Sutherland** and B.F. Koop. “Biological and transcriptional consequences of infection with *Facilispora margolisi* (Microsporidia: Crustaceacida) following vertical transmission among larval salmon lice *Lepeophtheirus salmonis*.” Poster presentation at the 1st International Conference for Integrative Salmonid Biology. Oslo, Norway
- 2012 **B.J.G. Sutherland***, K.W. Koczka, S.R.M. Jones and B.F. Koop. “Stressed lice and refractory responses: Host-parasite transcriptomics.” Oral presentation at the 9th International Sea Lice Conference. Bergen, Norway
- 2010 S.R.M. Jones*, **B.J.G. Sutherland** and B.F. Koop. “Attractions and rejections: exploring host specificity among salmon using the model ectoparasitic copepod *Lepeophtheirus salmonis*.” Oral presentation at The 12th International Congress of Parasitology (ICOPA). Melbourne, Australia
- 2010 **B.J.G. Sutherland***, S.G. Jantzen, D.S. Sanderson, E. Kim, S.R.M. Jones and B.F. Koop. “Understanding the varying sensitivities of salmon to *Lepeophtheirus salmonis* infections.” Poster presentation at the 8th International Sea Lice Conference. Victoria, BC, Canada
- 2010 S.G. Jantzen*, **B.J.G. Sutherland**, D.S. Sanderson, S.R.M. Jones and B.F. Koop. “Sea lice (*Lepeophtheirus salmonis*) transcriptional responses to gradients of salinity, temperature, and emamectin benzoate.” Poster presentation at the 8th International Sea Lice Conference. Victoria, BC, Canada
- 2009 **B.J.G. Sutherland***, S.G. Jantzen, D.S. Sanderson, E. Kim, S.R.M. Jones and B.F. Koop. “Understanding the varying sensitivities of salmon to *Lepeophtheirus salmonis* infections.” Poster presentation at Ecological and Evolutionary Ethology of Fishes, Vancouver, BC, Canada (*best poster prize*)
- 2009 **B.J.G. Sutherland***, G.A. Cooper, S.R.M. Jones and B.F. Koop. “Transcriptomic responses of juvenile pink salmon *Oncorhynchus gorbuscha* following exposure to the salmon louse *Lepeophtheirus salmonis*.” Oral presentation at Aquaculture Canada 2009. Nanaimo, BC, Canada

SOCIETY & ORGANIZATION MEMBERSHIP

Canadian Society of Ecology and Evolution (CSEE-SCEE) (2015-*present*)
 Ressources Aquatiques Québec (RAQ) (2014- *present*)
 American Fisheries Society (2014- *present*)
 World Aquaculture Society (2012-2014)

SUPERVISION & MENTORSHIP

2013-2015 Jordan Poley (Ph.D. student, University of PEI)
 2013 Anita Müller (Visiting Scientist, Fisheries and Oceans Canada)
 2011-2012 Kim Koczka (Research Assistant, UVic)
 2012 Ben Cox (Undergraduate, UVic)

2011 Sofie Remø (Visiting Scientist, Norway)
2010-2011 Christian Sahlmann (Visiting Scientist, Norway)

REVIEWING

I have served as an external referee for articles submitted to *BMC Genomics* (2011, 2012, 2014*2), *Physiological Genomics* (2013), *Comparative Biochemistry and Physiology Part D* (2015*2), *PLoS ONE* (2014, 2015), *Axios Reviews* (2015), *PeerJ* (2015), *Aquaculture* (2014), *Fish and Shellfish Immunology* (2015), *Canadian Journal of Fisheries and Aquatic Sciences* (2015), *Journal of Fish Diseases* (2015), *Heredity* (2012), *Molecular Biology and Evolution* (2012), *Molecular Ecology* (2013, 2014, 2015*3), *Molecular Ecology Resources* (2013), *International Journal of Parasitology* (2013), and *Parasites & Vectors* (2013, 2014).

COMMITTEE INVOLVEMENT / VOLUNTEER ACTIVITY

2013-2014 Executive Member of Trainees in Biomedical Research, UVic
2013 Search Committee for the Director of the Centre for Biomedical Research, UVic
2011-2013 Dept. of Biology Graduate Student Committee (student representative)
2011 Finance Committee (co-chair) for the UVic Graduate Student Symposium
2010 Student Organizer Sea Lice 2010 conference at Victoria, BC, Canada
2010 Finance Committee for the UVic Graduate Student Symposium
2009 Glendale Gardens, Victoria, BC, Canada Volunteer
2007-2008 Thompson Rivers University Omega campus newspaper contributor
2007 Thompson Rivers University Science Fair Judging Committee

REFERENCES

Professor Louis Bernatchez *MSRC FRSC* (Postdoctorate supervisor). Biology Dept., Université Laval, Québec, Canada. Phone: (418) 656-3402 Email: louis.bernatchez@bio.ulaval.ca

Professor Ben Koop *FRSC* (Ph.D. advisor). Biology Dept., University of Victoria, Victoria, British Columbia Canada. Phone: (250) 472-4071 Email: bkoop@uvic.ca

Dr. Simon Jones (Ph.D. committee member). Fisheries and Oceans Canada, Pacific Biological Station, Nanaimo, Canada. Phone: (250) 729-8351 Email: simon.jones@dfo-mpo.gc.ca

Dr. Steve Perlman (Ph.D. committee member). Dept. of Biology, University of Victoria, Victoria, British Columbia Canada. Phone: (250) 721-6319 Email: stevep@uvic.ca