

Stewart Charles Johnson, Ph.D.

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EDUCATION

Date	Discipline	Degree	Institution
1987-1991	Biological Sciences	Ph.D.	Simon Fraser University, Burnaby, BC
1982-1986	Biological Sciences	M.Sc.	Dalhousie University, Halifax, NS
1976-1978	Biological Sciences	B.Sc.	University of Victoria Victoria, BC

POST DOCTORAL TRAINING AND ACADEMIC AWARDS

Post Doctoral Training

Dates	Field of Research	Place	Supervisor
06/95 – 04/96	Marine Molecular Biology	Hopkins Marine Station, Stanford University	Dr. Paul Levine
09/91 - 12/93	Zoology: Aquatic Animal Health	University of British Columbia	Dr. Leo Margolis

Academic Awards

Date	Agency	Place of Tenure
Awarded 09/95	Norwegian Research Council	Declined
09/91 - 12/93	Visiting Scientist Fellowship National Sciences and Engineering	University of British

	Research Council of Canada Postdoctoral Fellowship	Columbia
Awarded 09/91	National Sciences and Engineering Research Council of Canada Visiting Fellowship in Canadian Government Laboratories	Declined
05/91 - 08/91	Presidents Research Stipend	Simon Fraser University
09/88 - 04/91	B.C. Science Council GREAT Award	Simon Fraser University
09/88 - 08/90	Simon Fraser University Graduate Fellowship	Simon Fraser University
01/88 - 05/88	Simon Fraser University Research Fellowship	Simon Fraser University
05/84 - 02/85	Dalhousie Graduate Fellowship	Dalhousie University
05/83 - 05/84	National Sciences and Engineering Research Council of Canada Postgraduate Scholarship	Dalhousie University

ACADEMIC POSITIONS

Dates	Title	Department	Institution
2008 – present	Adjunct Professor	Biology	Vancouver Island University, Nanaimo, BC
1999 - present	Adjunct Professor	Ocean Sciences Centre	Memorial University, St. John's NF
1998 - present	Adjunct Professor	Biological Sciences	Dalhousie University, Halifax, NS
1997 – 2002	Adjunct Professor	Anatomy and Physiology	Atlantic Veterinary College, University of Prince Edward Island Charlottetown, PE

PROFESSIONAL SOCIETIES

Crustacean Society
Canadian Society of Zoologists
American Society of Parasitologists
American Fisheries Society
World Aquaculture Society

Aquaculture Association of Canada
European Association of Fish Pathologists

PROFESSIONAL AND MANAGEMENT ACTIVITIES

Within DFO

Date	Activity	Position
2007 - present	Canada-Norway-US Trilateral Aquaculture Research and Development Cooperation Initiative	Theme Leader Fish Health
2008 - 2009	Aquatic Animal Health Review Committee	Member
2004 - present	Fisheries and Oceans Canada, Pacific Scientific Advice Review Committee	External Reviewer
2008 – present	PICES Working Group on <i>Environmental Interactions of Marine Aquaculture</i> (WGEIMA)	Co-chair 09 -10 Member
2008 – present	Scientific Advisor on the Genome BC project Genomics in Lice and Salmon	Scientific Advisor
2009-2010	DFO representative Genomics in Aquaculture, Santiago Chile	Invited Participant
2009 - 2010	Provided affidavit for court case	Scientific Expert
2009-2010	Norwegian Institute for Marine Research summit on molecular salmon louse research in Halifax, Nova Scotia	Invited Participant

External to DFO

2010 - present	College of Reviewers for the Canada Research Chairs	Member
2004 - 2007	National Research Council Joint Consultation Committee	Member
1988 - 2001	Institute for Marine Biosciences Safety Committee	Chair
2002 - 2007	National Executive of the Professional Public Service of Canada (PIPSC), NRC RO/RCO Group	Institute Representative and Member
2004 - 2007	National Executive of the Professional Public Service of Canada (PIPSC), NRC RO/RCO Group	Chair
2005 and 2007	National Executive of the Professional Public Service of Canada (PIPSC), NRC RO/RCO Bargaining Team	Member
2003 - 2004	NRC Genomic and Health Initiative <i>Areomonas salmonicida</i> Project	Program Leader
2003 -2005	Networks of Centres of Excellence	Member

	AquaNet Program Board of Directors (co-funded by NSERC, CIHR, SERC, Industry Canada)	
2004 - 2005	Networks of Centres of Excellence	Member
	AquaNet Program Executive Committee	
1997 – 2008	NSADC Experimental Marine Finfish Technical Review Sub-Committee	Chair
1997 – 2008	Nova Scotia Alternative Finfish Technical Review Committee	Member
1996 – 2000	Pest Management Regulatory Agency Integrated Sea Lice Management Steering Group	Member
2002 - 2006	British Columbia Sea Lice Working Group	Member
2004 - 2007	PIPSC Joint Consultation Committee	Member
2003- 2004	PIPSC Federal Science Advisory Council	Member
Conference organization / session moderator		
Date	Conference	Position
May 19-23, 2008	47 th Annual Meeting of the Canadian Society of Zoologists	Member Local Organizing Committee
July 11-15, 2005	The 9 th International Conference on Copepoda, Hammamet, Tunisia	Symposium Moderator
June 13-16, 2004	Gadoid Mariculture: Development and Future Challenges. ICES Symposium, Bergen, Norway	Session Moderator
Jan. 27-28, 2004	Sea Lice Workshop, Campbell River, BC	Organizer and Presenter
Aug. 1-5, 2003	American Society of Parasitologists Annual General Meeting 2003, Halifax, Nova Scotia	Co-chair Local Organizing Committee
Nov. 1–17, 2000	Pacific Rim Biotechnology Conference, Vancouver, BC	Session Moderator
June 28-30, 1999	Fourth International Conference on Sea Lice Biology 1999, Dublin, Ireland	Session Moderator
July 22-24, 1998	Crustacean Society 1998, Second International Conference on Sea Lice Biology, Amsterdam	Session Moderator
July 1989	American Society of Parasitologists Annual General Meeting 1989, Vancouver, BC	Member Local Organizing Committee

EDITORIAL BOARDS:

Diseases of Aquatic Organisms, **Subject Editor:** Genomics, Proteomics and Metabolomic Aspects

Open Fish Science Journal, **Editorial Advisory Board:** Fish Science Letters and Reviews

ACADEMIC SUPERVISION

Name	Years	Degree	Thesis Title	Present Position
Principle Supervisor				
Janel Swain	2003-2004	B.Sc. Honours	The heat shock response of the haddock <i>Melanogrammus aeglefinus</i> .	Dept. of Education University of Ottawa
David Gillett	2001 - 2003	M.Sc.	Characterization and expression of the recombination activating genes (RAG1 and RAG2) of halibut (<i>Hippoglossus hippoglossus</i>).	Research Technician University of Waterloo
Mark Fast	2001 - 2005	Ph.D.	<i>Lepeophtheirus salmonis</i> immunomodulation of salmonids hosts.	Assistant Professor Stony Brook University
David Gillett	1999	B.Sc. Honours	The effect of body size on the antibody response of haddock <i>Melanogrammus aeglefinus</i> .	Research Technician University of Waterloo
Kelly Ash	2001	B.Sc. Honours	Localization and Expression of Transforming Growth factor – β (TGF- β) in Atlantic halibut (<i>Hippoglossus hippoglossus</i>).	Private Industry
Erin Bentley	2000 - 2003	M.Sc.	Immunoglobulin structure and antibody response of the haddock (<i>Melanogrammus aeglefinus</i>).	Private Industry
Juan Carlos Casanova	2000 – 2003	M.Sc.	Development of the digestive system in haddock (<i>Melanogrammus aeglefinus</i>) and Atlantic cod (<i>Gadus morhua</i>).	Ph.D. Student Memorial University
Co-Supervised				
Russell Easy	2002 - 2004	M.Sc.	Taxonomy of selected species of <i>Myxobolus</i> (Myxozoa) from freshwater and coastal fishes of Nova Scotia; applications of light microscopy and molecular methods	Ph.D. Student Dalhousie
Amanda Roberts	2000	B.Sc. Honours	Investigation into haddock <i>Melanogrammus aeglefinus</i> immunoglobulin.	Self employed
Pablo Gonzalez	1998-2000	M.Sc.	Frontal filament morphogenesis in the salmon louse (<i>Lepeophtheirus salmonis</i>).	Ph.D. student U. Texas
Undergraduate and Summer Students				
Hanna McKenzie	Summer 2002		Dalhousie University, NRC WES Student	
Kelly Olgilvie	Summer 2002		Dalhousie University, NRC WES Student	
Danaelle Delange	Summer 2000		University of Ottawa, NRC WES Student	
Kirsten Bohonis	Summer 1998		Co-op Student, Dalhousie University	
Kathy Gurgul	Fall 1998		Co-op Student, University of Victoria	
Cristián Cox	Summer – Winter 1997		Work Term Student, University Nacional Andrés Bello, Chile	
Advisory/Examining Committees for Graduate Students				

Dr. Karin Boxaspen	Spring 2002	External Examiner, Ph.D. Department of Chemistry, University of Bergen, Bergen Norway	
Dr. Declan Nolan	June 2000	External Examiner, Ph.D. University of Nijmegen, Nijmegen, The Netherlands	
Dr. Niaml Nasur	1999 – 2001	Committee Member, Ph.D. Student, Dalhousie University	
Kelly O'Brien MacDonald	2001 - 2004	Committee Member, M.Sc. Student, Memorial University of Newfoundland.	
Francisco Ucan Marin	2002- 2004	Committee Member, M.Sc. Student, Dalhousie University	
Victoria Savoie	2002 – 2004	Committee Member, M.Sc. Student, St. Mary's University	
Alexandre Sachsida Garcia	2003 - 2006	Committee Member, Ph.D. Student, Memorial University of Newfoundland	
Sarah Westelmajer	2004 - 2008	Committee Member, M.Sc. Student, Memorial University of Newfoundland	
Russel Easy	2006 – present	Committee Member, Ph.D. Student Dalhousie University	
Lisa Bruce	2005 – 2007	Committee Member, M.Sc. Student Dalhousie University	
Tiago Hori	2006 - present	Committee Member, Ph.D. Student, Memorial University of Newfoundland	

Postdoctoral Fellows

Position

Dr. C. Thomson	2010 -	
Dr. Mark Fast	2005 -2007	Novartis Research Chair, University of Prince Edward Island
Dr. Tony Manning	2005 -2007	NRC PDF Genomics in Aquaculture Program
Dr. Tony Manning	2004 - 2005	AquaNet PDF working on digestion in marine finfish. (co-supervised with S. Douglas)
Dr. Harry Murray	2000 - 2004	Researcher, Fisheries & Oceans Canada
Dr. Kyoung Park	2000- 2004	Research Associate NRC
Dr. John Moran	2001 - 2003	Royal Canadian Mounted Police
Dr. Chris Ottinger	1997- 1998	Immunologist, USGS Leetown Fish Health Laboratory

MAJOR RESEARCH INTERESTS

I conduct research on diseases, immunology, physiology and husbandry of aquatic animals. My research activities use a multidisciplinary approach and include collaborations with both national and international researchers from a variety of universities, government institutes and industry partners.

Disease research focuses on determining the nature of the relationship between fish and three different pathogens: nodavirus (Atlantic cod, turbot), *Aeromonas salmonicida* (Atlantic salmon) and the sea louse *Lepeophtheirus salmonis* (Atlantic and Pacific salmon). I apply molecular biology, proteomics, virology, microbiology and immunology to investigate virulence mechanisms of pathogens, the establishment of carrier states, host immunosuppression and disease management techniques such as vaccination.

Ongoing research activities include:

1. Studies on host-pathogen interactions (*L. salmonis* and *A. salmonicida*).

2. Studies on how husbandry and environmental conditions affect physiology, growth performance and disease resistance of Atlantic cod and Atlantic salmon.
3. Techniques for nodavirus disease diagnosis and management.
4. Vaccine development (*L. salmonis* and *A. salmonicida*).
5. Development of broodstock and genomics resources for Atlantic cod (see www.Codgene.ca).
6. Development of genomics resources for health assessment of mussels (see www.Mytome.ca)

RESEARCH SUPPORT CURRENT FUNDING

DFO: PARR

Sea Lice Infection Levels on Juvenile Salmon during Early Seawater Residency and Migration out of the Strait of Georgia.

Co-Applicants: Stewart Johnson, Dick Beamish, Marc Trudel

Period of Award April 2010 – March 2012

Value of Award: \$596,700

DFO: ACRDP

Development of Genomic Health Assessment Tools for Marine Mussels.

Applicants: Stewart Johnson

Period of Award April 2009 – March 2012

Value of Award: \$255,700

GENOME BC

Development of a Health Assessment Tool for Marine Mussels (Myt-OME).

Co-Applicants: Helen Gurney-Smith, Stewart Johnson

Period of Award January 2009 – January 2010

Value of Award: \$199,220

RESEARCH SUPPORT PAST FUNDING

DFO: ACRDP

Soft-flesh suppression technology: Inhibiting the post-harvest effects of *Kudoa thyrsites* infection in farmed Atlantic salmon.

Applicant: Stewart Johnson

Period of Award April 2009 – March 2010

Value of Award: \$289,200

DFO: ACRDP

Mouth Rot – *Tenacibaculum maritimum*- tracking pathogenesis and typing.

Applicant: Stewart Johnson

Period of Award April 2009 – March 2012

Value of Award: \$84,800

DFO: PARR

EST Sequencing and the Development of Genomic Tools for the Assessment of Impacts of Aquaculture Activities on Native Little Neck Clams (*Protothaca staminea*)

Applicants: Stewart Johnson

Period of Award April 2009 – March 2010

Value of Award: \$16,200

GENOME CANADA

Atlantic Cod Genomics and Broodstock Development.

Co-Applicants: Sharen Bowman, Jane Symonds, **Stewart Johnson**, Edward Trippel, Joe Brown, Kurt Gamperl, Andy Robinson, Keith Culiver, Jake Elliot, George Nardi, Jonathan Moir

Period of Award: August 2005 - August 2009

Value of Award: \$6,353,046 (Genome Canada) \$18.5 M with matching funds

NSERC

Infrastructure support for the Aquatron Laboratory

Co-Applicants Jeff Hutchins Shelly Adamo, Paul Benson, John Cullen, Jonathan Grant, **Stewart Johnson**, Ana Metaxas, Ransom Myers, Bill Pohajdak, Bob Scheibling Chris Taggart

Period of Award: April 2005-2008

Value of Award \$500,000

NRC GENOMICS AND HEALTH INITIATIVE

Genomic Approaches to Aquatic Animal Health Management

Period of Award: April 2005 – March 2008

Value of Award: \$1.25M per year plus \$1.4M matching funds

AQUACULTURE COLLABORATIVE RESEARCH AND DEVELOPMENT PROGRAM

Optimization of diagnostic methodologies for the detection and life history pathogenesis studies of Betanodavirus in production and broodstock Atlantic Cod (*Gadus morhua*)

Co-Applicants: David Groman, Nellie Gagné, **Stewart Johnson**, Tokinora Iwamoto

Period of Award April 2006 – March 2008

Value of Award \$104,000

NRC/CSIC COOPERATION PROGRAM WITH SPAIN (Co-PI)

Functional genomics of responses of turbot (*Scophthalmus maximus*) to experimental infections of atypical *Aeromonas salmonicida* and nodavirus.

Principal Investigators: **Stewart Johnson**, Antonio Figueras

Collaborators: Laura Brown, Beatriz Novoa, José Meseguer Peñalver, Victoriano Mulero Méndez

Period of Award: August 2004 - August 2007

Value of Award: \$273,000 Canadian activities only

**BC INNOVATION COUNCIL, AQUACULTURE AND ENVIRONNENT RESEARCH
FUND (Co-PI)**

The Effects of Infection by the Salmon Louse, *Lepeophtheirus salmonis* on Health of Pink Salmon (*Oncorhynchus gorbuscha*).

Principal Investigators: **Stewart Johnson**, Simon Jones

Collaborators: Luis Afonso, George Iwama

Period of Award: April 2003 – April 2005

Value of Award: \$140,000

US DEPARTMENT OF AGRICULTURE

Development of diagnostic and management techniques to select cod broodstocks and hatchery stocks free from nodavirus.

INVESTIGATORS: Robert Goetz, Scott Lindell, Steven Roberts, **Stewart Johnson**, Nick Brown, George Nardi, Larry Buckley, Deborah Bouchard

NRC GENOMICS AND HEALTH INITIATIVE (Co-PI)

Genomics in Aquaculture - Host-Pathogen Interactions: The *Aeromonas salmonicida*/*Salmo salar* Model System"

Program Leader: Stewart Johnson (2003-2004)

Period of Award: April 2002 – March 2005

Value of Award: \$800,000 per year.

NRC GENOMICS AND HEALTH INITIATIVE

Genomics in Aquaculture - Host-Pathogen Interactions: The *Aeromonas salmonicida*/*Salmo salar* Model System"

Period of Award: April 2002 – March 2005

Period of Award: April 1999 – March 2002

Value of Award: \$1.3M per year.

NETWORK OF CENTERS OF EXCELLENCE

AQUANET THEME: Animal Production:

Seasonal Effects on Immune Function, Stress and Metabolism of Haddock and Atlantic Cod: Implications for Cage Culture.

NETWORK INVESTIGATORS: Kurt Gamperl (Principal Investigator), Brian Dixon, Duane Barker, Joe Brown, **Stewart Johnson**, Scott McKinley, George Iwama, Atef Mansour

Period of Award: April 2003 – April 2006

Value of Award: \$325,500

NETWORK OF CENTERS OF EXCELLENCE (PI)

AQUANET THEME: Animal Production:

The biology, pathogenesis and epizootiology of nodavirus strains found in Atlantic cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*).

NETWORK INVESTIGATORS: **Stewart Johnson** (Principal Investigator), Brian Dixon, Laura Brown, David Groman, Carmencita Yason, Gilles Olivier.

Period of Award: April 2003 – April 2006
Value of Award: \$262,125

NETWORK OF CENTERS OF EXCELLENCE

AQUANET THEME: Animal Production:

Advancing Cold-Water Marine Finfish Production in Eastern Canada

NETWORK INVESTIGATORS: Joe Brown (Principal Investigator), Céline Audet, Pierre Blier, Susan Douglas, Jean-Denis Dutil, **Stewart Johnson**, Santosh Lall, Yvan Lambert, Matt Litvak, Chris Parrish.

Period of Award: April 2003 – April 2006

Value of Award: \$330,000

NETWORK OF CENTERS OF EXCELLENCE (Co-PI)

AQUANET THEME: Animal Production (AP 3):

Host-Pathogen Interactions: The *Aeromonas salmonicida*/*Salmo salar* Model System Applied to Non-salmonid Finfish.

Principal Investigators: **Stewart Johnson** and Laura Brown

Principal Collaborators: George Iwama (UBC)

Period of Award: September 2000 – April 2003

Value of Award: \$224,700

NETWORK OF CENTERS OF EXCELLENCE

AQUANET THEME: Animal Production (AP 8):

Optimization of larval feeding and digestion in Atlantic halibut, Atlantic cod, haddock and two small flounder species.

Principal Investigators: Joseph Brown and Céline Audet

Principal Collaborators: Susan Douglas, **Stewart Johnson** and Chris Parrish.

Period of Award: September 2000 – April 2003

Value of Award approximately \$ 344,500

NRC/NSERC RESEARCH PARTNERSHIP GRANT

The interaction between sea lice and salmonid fishes: Development of alternative methods of control; File number 653-32-96

Principal Investigator: John F. Burka

Principal Collaborators: **Stewart Johnson**, David Speare, Gary Conboy, David Sims, Neil Ross and Santosh Lall

Awarded: December 1996 – December 2001

Value of Award: \$ 505,000

PATENTS

Ross, N.W., **Johnson, S.C.**, Fast, M.D. and V.E. Ewart 2005. Recombinant vaccines against caligid copepods (sea lice) and antigen sequences thereof. International Application Number: PCT/CA2005/00178

Hubert S., Higgins B., Bowman S., Borza T., Tarrant-Bussey J., Simpson G., Garber A., Van der Voort G., **Johnson S.C.**, Rise M.L., Robinson J.A.B., Hastings C. E., Hori T.S., Afonso L., Gamperl A.K. Genetic Marker Identification in Atlantic Cod. International Patent Application No: PCT/CA2010/000504; International Filing Date: 09.04.2010; Publication Number: WO/2010/115275; Publication Date: 14.10.2010

Note: Two provisional patents have been filed for vaccines against *Aeromonas salmonicida*.

PEER-REVIEWED PUBLICATIONS

1. Booman M., Borza T., Feng C.Y., Hori T. S., Higgins B., Culf, A., Léger D., Chute I. C., Belkaid A., Rise M., Gamperl A. K., Hubert S., Kimball J., Ouellette R.J., **Johnson S. C.**, Bowman S. and M. L. Rise. (in press) Development and validation of a 20K Atlantic cod (*Gadus morhua*) oligonucleotide microarray based on a collection of over 150,000 ESTs. Marine Biotech. DOI 10.1007/s10126-010-9335-6
2. Borza, T., Stone, C. Rise, M.L. Bowman, S. and **S.C. Johnson** 2010. Atlantic cod (*Gadus morhua*) CC chemokines, diversity and expression analysis. Dev. Comp. Immunol. 34: 904-913.
3. Bron, J.E., Frisch, D., Goetze, E. **Johnson, S.C.**, Lee, C.E. and G.A. Wyngaard. 2010. Copepod Genomics: New tools for a better understanding of aquatic systems. BioScience (in revision)
4. Rise, M.L., Hall, J., Rise, M., Hori, T., Brown, M., Gamperl, A. K., Hubert, S., Kimball, J., Bowman, S. and **S.C. Johnson** 2010. Impact of asymptomatic nodavirus carrier state and intraperitoneal viral mimic injection on brain transcript expression in Atlantic cod (*Gadus morhua*). Physiol. Genomics 42: 266-280.
5. Bowman, S., Hubert, S., Higgins, B., Stone, C., Kimball, J. Borza, T., Tarrant Bussey, J., Simpson, G., Kozera C., Curtis, B.A., Hall, J.R., Hori, T.S., Feng, C.Y., Rise, M., Booman, M., Gamperl, A.K., Trippel, E., Symonds, J., **Johnson, S.C.**, and M.L. Rise. 2010. An integrated approach to gene discovery and marker development in Atlantic cod (*Gadus morhua*). Marine Biotech. DOI 10.1007/s10126-010-9285-z
6. Meyer, G.R., Kim, E., Lowe, G.J., Abbott C.L., **Johnson S.C.**, and S.R. Gilmore 2010. Health Status of Olympia Oysters (*Ostrea lurida*, Carpenter, 1864) in British Columbia, Canada. J. Shell. Res. 29: 181-185.
7. Hori, T.S., Gamperl, A.K., Afonso, L.O.B., **Johnson, S.C.**, Hubert, S. Kimball, J., Bowman, S. and M.L. Rise 2010. Heat shock-responsive genes identified and

validated in Atlantic cod (*Gadus morhua*) liver, head kidney and skeletal muscle using genomic techniques. BMC Genomics 11:72

8. Park, I.S., Park, M.O., Hur, J.W., Kim, D.S., Chang, Y.J., Kim, Y.J., Park, J.Y. and **S.C. Johnson** 2009. Anesthetic effects of lidocaine-hydrochloride on water parameters in simulated transport experiment of juvenile winter flounder, *Pleuronectes americanus*. Aquaculture 294: 76-79.
9. Fast, M.D., Tse, B., Boyd, J.M. and **S.C. Johnson** 2009. Mutation within the *Aeromonas salmonicida* type III secretion system affect host leucocyte activation and downstream immune responses. Fish Shellfish Immunol. 27: 721-728.
10. Feng, C., **Johnson, S.C.**, Hori, T.S., Rise, M., Hall, J.R., Gamperl, K.A., Hubert, S., Kimball, J., Bowman, S. and M.L. Rise 2009. Identification and analysis of differentially expressed genes in immune tissues of juvenile Atlantic cod (*Gadus morhua*) stimulated with formalin-killed *Aeromonas salmonicida*. Physiological Genomics 37: 149-163
11. Park, K.C., Osborne, J.A., Montes, A., Dios, S., Nerland, A.H., Novoa, B., Figueras, A., Brown, L.L. and **S.C. Johnson** 2009. Immunological responses of turbot (*Psetta maxima*) to nodavirus infection or poly I:C stimulation, using expressed sequence tags (ESTs) analysis and cDNA microarrays. Fish Shellfish Immunol. 1: 91-108
12. Reith, M., Singh, R.K., Curtis, B., Boyd, J.M., Bouevitch, A., Kimball, J., Munholland, J., Murphy, C., Sarty, D., Williams, J., Nash, J.H.E., **Johnson, S.C.** and L.L. Brown 2008. The genome of *Aeromonas salmonicida* subsp. *salmonicida* A449: insights into the evolution of a fish pathogen. BMC Genomics 9: 427
13. Liu, X. Afonso, L.O.B., Altman, E., **Johnson S.C.**, Brown, L.L. and Li, J. 2008. O-acetylation of sialic acids in N-glycans of Atlantic salmon (*Salmon salar*) serum is altered by handling stress. Proteomics 8: 2849-2857
14. Boyd, J.M., Dacanay, A., Knickle, L.C., Touhami, A., Brown, L.L., Jericho, M.H., **Johnson, S.C.** and M. Reith 2008 Contribution of Type IV Pili to the Virulence of *Aeromonas salmonicida* subsp. *salmonicida* in Atlantic salmon (*Salmo salar* L.). Infect. Immun. 76: 1445-1455
15. Pérez-Casanova, J. C., Rise M.L., Dixon, B., Afonso, L.O.B., Hall, J.R., **Johnson, S.C.**, and A.K. Gamperl. 2008. The immune and stress responses of Atlantic cod to long-term increases in water temperature. Fish Shellfish Immunol. 24: 600-609.
16. Hori, T.S.F., Iwama, G.K., **Johnson, S.C.**, Moraes, G. and L.O.B. Afonso 2008. Impairment of the stress response in juvenile matrinxã (*Brycon cephalus*) exposed to phenol. Comp. Biochem. Physiol. 147: 416-423.

17. Wagner, G.N., Fast, M.D. and **S. C. Johnson** 2008. Physiology and immunology of *Lepeophtheirus salmonis* infections on salmonids. Trends Parasitol. 24: 176-183.
18. Rise, M.L., Hall, J., Rise, M., Hori, T., Gamperl, A. K., Kimball, J., Hubert, S., Bowman, S. and **S.C. Johnson** 2008. Functional genomic analysis of Atlantic cod (*Gadus morhua*) spleen response to the viral mimic polyriboinosinic polyribocytidylic acid (pIC). Dev. Comp. Immunol. 32: 916-931.
19. Fast, M.D., Hosoya, S., **Johnson, S.C.** and L.O.B. Afonso 2008. Neuroendocrine response and immune-related gene expression of Atlantic salmon (*Salmo salar*) subjected to short- and long-term stress. Fish Shellfish Immunol. 24: 194-204.
20. Garcia, A.S., Parrish, C.C. Brown, J.A., **S.C. Johnson** and S. Leadbeater 2008. Use of differently enriched rotifers, *Brachionus plicatilis*, during larviculture of haddock, *Melanogrammus aeglefinus*: Effects on early growth, survival and body lipid composition. Aquacult. Nut. 14: 431-444.
21. Afonso, L.O.B., Hosoya, S., Osborne, J., Gamperl, A.K. and **S. Johnson** 2008. Lack of glucose and hsp70 responses in haddock *Melanogrammus aeglefinus* (L.) subjected to handling and heat shock. J. Fish Biol. 72: 157-167.
22. Jones, S.R.M., Fast, M.D. and **S.C. Johnson** 2008. Influence of reduced feed ration on *Lepeophtheirus salmonis* infestation and inflammatory gene expression in juvenile pink salmon. J. Aquat. Animal Health 20: 103-109.
23. Pérez-Casanova, J.C., Afonso, L.O.B., **Johnson, S.C.**, Currie, S. and A.K. Gamperl. 2008. The stress and metabolic responses of Atlantic cod (*Gadus morhua*, L.) to acute thermal stress. J. Fish Biol. 72: 899-916.
24. **Johnson S.C.** and H.I. Browman 2007. Use of Genomics, Proteomics and Metabolomics in Marine Ecology. Theme Section, Mar. Ecol. Prog. Series. 332: 247-248. Authors conceived and edited this Theme Section Mar. Ecol Prog. Series. 332: 247-310.
25. Jones, S.M., Fast, M.D., **Johnson, S.C.** and D.B. Groman 2007. Earlier rejection of *Lepeophtheirus salmonis* from pink salmon *Oncorhynchus gorbusca* compared with chum salmon *O. keta* associated with the expression of proinflammatory genes. Dis. Aquat. Org. 75: 229-238.
26. Fast, M.D., **Johnson, S.C.**, Eddy, T.D. Pinto, D. and N.W. Ross 2007. *Lepeophtheirus salmonis* secretory products and their effects on Atlantic salmon immune gene regulation. Parasit. Immun. 29: 179-189.

27. Hosoya, S., **Johnson, S.C.**, Iwama, G.K., Gamperl, A.K. and L.O.B. Afonso 2007. Changes in free and total plasma cortisol levels in juvenile haddock (*Melanogrammus aeglefinus*) exposed to long-term handling stress. *Comp. Biochem. Physiol. A.* 146: 78-86.
28. Fast, M.D., **Johnson, S.C.** and S.R.M. Jones. 2007. Differential expression of the proinflammatory cytokines IL-1 β -1, TNF α -1 and IL-8 in vaccinated pink (*Ocorhynchus gorbuscha*) and chum (*Oncorhynchus keta*) salmon juveniles. *Fish Shellfish Immunol.* 22: 403-407
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30. Fast, M.D., Afonso, L. and **S.C. Johnson** 2006. Protocols & GuidelinesA Reference Manual for Research Involving Wild/Cultured Fish Interactions with Sea Lice. 3 – Methods for Studying the Effects of Sea Lice Infection on Host Physiology & Health. British Columbia Pacific Salmon Forum <http://www.pacificsalmonforum.ca//pdfs-all-docs/PGs.pdf>.
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CONFERENCE AND OTHER SEMINAR PRESENTATIONS

1. Approaches to the Study of the Immune System of Atlantic Cod. American Fisheries Society, Annual General Meeting, Nashville, Tennessee, USA, August 30 - September 3rd, 2009 (**Invited Presentation**)
2. Copepod genomics – what can it do for me? 10th International Conference on Copepoda, Pattaya, Thailand, July 13-19, 2008 (**Invited Presentation**)
3. Genomic Tools for Cod Immunological Research: Characterization and Expression of CC Chemokines of the Atlantic Cod (*Gadus morhua*). International Conference on Fish Diseases and Fish Immunology, Reykjavik, Iceland, September 6-9, 2008
4. Atlantic cod genomics and broodstock development. Biodiversity Institute of Ontario, Guelph, Ontario, Canada. February 13, 2008 (**Invited Presentation**)
5. The Atlantic cod genomics and broodstock development program. Gulf Coast Marine Laboratory, Ocean Springs, USA, January 31, 2008 (**Invited Presentation**)

6. How can genomics, proteomics and metabolomics be used in studies of parasitic copepods? 7th International Symposium on Parasites of Fish, Viterbo, Italy, September 24-28th, 2007. **(Invited Presentation)**
7. The development of molecular tools for studying the immune system of Atlantic cod (*Gadus morhua*). 13th EAAP International Conference on Diseases of Fish and Shellfish, Grado, Italy, September 17-21st, 2007.
8. The interferon system of the Atlantic cod (*Gadus morhua*). 7th International Symposium on Fish Immunology, Stirling, Scotland, June 18-22nd, 2007. **(Invited Presentation)**
9. From Sequence to Sickness: Using genomics and biotechnology to understand aquatic animal pathogens. Department of Bioresource Science, University of Hiroshima, December 4, 2006. **(Invited Presentation)**
10. *Lepeophtheirus salmonis* secretory components and their effects on salmonid immune gene regulation. 11th International Congress of Parasitology, Glasgow Scotland. Aug. 6-11, 2006. **(Invited Presentation)**
11. Changes in the immune system of Atlantic salmon (*Salmo salar*) exposed to long-term stress. 7th International Congress on the Biology of Fish, St. John's, Newfoundland, Canada. July 19-22, 2006.
12. Investigating the Biology, Husbandry and Health of Non-salmonid Finfish. International Marine Biotechnology Conference, St. John's, Newfoundland June 7-12, 2005. **(Invited Presentation)**.
13. Nodavirus and Atlantic cod research needs and the status of our knowledge. Nodavirus Workshop, University of New Hampshire, Dec. 8, 2004. **(Invited Presentation)**
14. Molecular detection and characterization of Nodavirus in several marine fish species from the north western Atlantic. Gadoid Mariculture: Development and Future Challenges. ICES Symposium, Bergen Norway, June 13-16, 2004.
15. The response of the immunome of haddock (*Melanogrammus aeglefinus*) to vaccination. Gadoid Mariculture: Development and Future Challenges. ICES Symposium, Bergen Norway, June 13-16, 2004.
16. The biology and ecology of sealice, MAFF Sealice Workshop, Campbell River, BC, Jan. 27-28, 2004. **(Invited Presentation)**.
17. The immunological response of the Atlantic halibut to vaccination and the development of the immune system of larval halibut. Atlantic Halibut Workshop, Halifax, NS, Jan. 21-22, 2004. **(Invited Presentation)**.

18. Microarray analysis of gene expression in the liver of Atlantic Halibut vaccinated with *Vibrio anguillarum* and *Aeromonas salmonicida*. EAAP 11th International Conference of Diseases of Fish and Shellfish, Malta, Sept. 21-26, 2003.
19. Fish Health Research Activities on Haddock (*Melanogrammus aeglefinus*) Atlantic halibut (*Hippoglossus hippoglossus*) and Atlantic cod (*Gadus morhua*) in Eastern Canada. Aquaculture International, Salvador Brazil, May 19-23, 2003. **(Invited Presentation)**
20. The biology and ecology of sea lice in British Columbian waters. BC Science Council, Sea Lice Research Workshop, Vancouver, BC, Feb. 22-24, 2003. **(Invited Presentation)**
21. Nodavirus disease in juvenile Atlantic cod, *Gadus morhua*. Nodavirus Workshop, St. John's, NL, Nov. 27, 2002. **(Invited Presentation)**
22. Diagnostic techniques for nodavirus. Nodavirus Workshop, St. John's, NL, Nov. 27, 2002. **(Invited Presentation)**
23. Development of haddock *Melanogrammus aeglefinus* culture in Atlantic Canada. Annual Meeting of the Aquaculture Association of Canada, Charlottetown, PEI, Sept 17-20, 2002. **(Invited Presentation)**
24. A review of the impacts of parasitic copepods on marine aquaculture. 8th International Conference on Copepoda. National Taiwan Ocean University, Keelung, Taiwan, July 21-26, 2002. **(Invited Presentation)**
25. New developments in our understanding of host-parasite interactions between the salmon louse, *Lepeophtheirus salmonis* and its hosts. American Physiological Society Intersociety Meeting, The Power of Comparative Physiology, San Diego, USA, August 24-28, 2002. **(Invited Presentation)**
26. Fish disease research at the Institute for Marine Biosciences. Institute of Zoology, Academia Sinica. Taipei, Taiwan, August 1, 2002. **(Invited Presentation)**
27. Identification and characterization of a piscine neuropathy nodavirus from juvenile Atlantic cod (*Gadus morhua*). European Association of Fish Pathologists, Tenth International Conference of Diseases of Fish and Shellfish, Dublin, Ireland, . September 10-14, 2001.
28. Identification and characterization of a piscine neuropathy nodavirus from juvenile Atlantic cod (*Gadus morhua*). Aquaculture Canada, 2001, Halifax, N.S. May 6-9, 2001.

29. Molecular Approaches to Fish Health – *the Aeromonas salmonicida / Salmo salar* Model System. Annual Eastern Fish Health Workshop. Shepherdstown April 23-26, 2001.
30. The effects of different feeding regimes on haddock (*Melanogrammus aeglefinus*) larval development and survival. Aquaculture Canada, 2000, Moncton, N.B. May 28-31, 2000.
31. Molecular cloning and sequencing of trypsin-like cDNAs from the salmon louse, *Lepeophtheirus salmonis* and the role of these enzymes in the host-parasite relationship. Canadian Society of Zoologists Meeting, St. Andrews, N.B. May, 3-6, 2000.
32. Development of haddock aquaculture in Atlantic Canada. NRC-Wide Research and Technology Development Forum, Magog, QC., April 18-20, 2000. **(Invited Presentation)**
33. New developments in our understanding of the biology of the salmon louse, *Lepeophtheirus salmonis*. University of Nijmegen, Nijmegen, The Netherlands. June 29, 2000. **(Invited Presentation)**
34. Development of haddock (*Melanogrammus aeglefinus*) aquaculture in Atlantic Canada. Aquaculture Canada, 99, Victoria, B. C. Oct. 26-29, 1999.
35. New developments in our understanding of the biology and control of the salmon louse, *Lepeophtheirus salmonis*. Aquaculture Canada, 99, Victoria, B. C. Oct. 26-29, 1999 **(Invited presentation)**
36. Host parasite interactions between the salmon louse *Lepeophtheirus salmonis* and Atlantic salmon. European Association of Fish Pathologists, Ninth International Conference of Diseases of Fish and Shellfish, Rhodes, Greece, September 19-24, 1999.
37. Development of Cold Water Fish Species for use in Aquaculture in Atlantic Canada. FOID, Pusan, South Korea, Aug. 25-26, 1999. **(Invited Presentation)**
38. Expressed sequence tags of the salmon louse *Lepeophtheirus salmonis* and characterization of trypsin and trypsin-related enzymes. Fourth International Workshop on Sea Lice Biology. Dublin, June 28-20, 1999.
39. Structural and functional characterization of a mannose binding lectin from the serum of Atlantic salmon (*Salmo salar*). Third International Symposium on Aquatic Animal Health, Baltimore, August 30-September 3, 1998.

40. Investigation of the role of skin mucus proteases of Atlantic salmon during *Lepeophtheirus salmonis* infestation. Third International Workshop on Sea Lice Biology. Amsterdam, July 22-24, 1998.
41. The interaction between *Lepeophtheirus salmonis* and salmonid fishes. Workshop on Sea Lice Control on Fish Farms. Trondheim, Norway, November 6-8, 1997. **(Invited Presentation)**
42. Interactions between Atlantic Salmon and the salmon louse *Lepeophtheirus salmonis*. Third International Symposium on Research for Aquaculture: Fundamental and Applied Aspects. Barcelona, August 24-27, 1997.
43. Alternatives to chemotherapeutants for the control of sea lice on farmed salmonids. Bio Atlantech, Fredericton, New Brunswick, October 1996. **(Invited Presentation)**
44. Sea lice disease in wild sockeye salmon (*Oncorhynchus nerka*) stocks of Alberni Inlet, British Columbia, Canada. Fourth International Symposium of Ichthyoparasitology, Munich, Germany, October 1995.
45. Effects of host on the biology of the parasitic copepod, *Lepeophtheirus salmonis*. Fifth International Conference on Copepoda, Baltimore, June, 1993.
46. Host effects on egg production, development, and growth of the parasitic copepod *Lepeophtheirus salmonis*. Canadian Society of Zoologists Meeting, Guelph, May, 1993.
47. Host factors controlling the biology of *Lepeophtheirus salmonis* on wild and farmed salmonids. B. C. Parasitologists Meeting, University of British Columbia, March, 1993.
48. Comparative susceptibility and histopathology of the host response of naive Atlantic, chinook, and coho salmon to experimental infection with *Lepeophtheirus salmonis* (Copepoda: Caligidae). First European Conference on Crustacea, Paris, September, 1992.
49. Development of *Lepeophtheirus salmonis* (Copepoda: Caligidae). 64th Annual Meeting of the American Society of Parasitologists, Vancouver, August, 1989.
50. The ecology of *Lepeophtheirus salmonis* on wild and farmed salmonids. B. C. Parasitologists Meeting, Simon Fraser University, April 1989.
51. Species composition and abundance of harpacticoid copepods on intertidal macroalgae, *Fucus vesiculosus* and *Ascophyllum nodosum*, off Nova Scotia. Second International Conference on Copepods, Ottawa, August, 1984.

ABSTRACTS

Booman,

Add ACC 2010 Abstracts

1. Booman, M. Borza, T., Hori, T. S., Fend, C. Y.
2. Hori, T. S., Rise, M. L., Booman, M., Johnson, S. C., Bowman, S., Borza, T., Gamperl, K. 2010. Microarray analysis of the Atlantic cod (*Gadus morhua*) spleen transcriptomic response to elevated temperature and intraperitoneal injection of the viral mimic polyribonucleosinic polyribocytidylic acid. Universitat Autònoma de Barcelona, Barcelona, Spain, July 5-9, 2010.
3. Rise, M.L., Booman, M., Hori, T. S., Feng, C. Y., Hall, J. R., Browne, M., Gamperl, A. K., Rise, M., Hubert, S., Kimball, J., Borza, T., Bowman, S. and S. C. Johnson. Functional genomic studies of Atlantic cod (*Gadus morhua*) defense responses. Canadian Society of Zoologists Meeting, Vancouver, Canada, May 17 - 21, 2010.
4. Booman, M. Borza, T., Hori, T. S., Feng, C. Y., Hall, J. R., Rise, M., Gamperl, A. K., Hubert, S., Kimball, J., Johnson, S. C., Bowman, S. and M. L. Rise. 2010. Development of an Atlantic cod (*Gadus morhua*) oligonucleotide microarray and its use for studying cod tissue global gene expression responses to immune stimuli. Plant and Animal Genome XVIII Conference, San Diego, USA, January 9 – 13, 2010.
5. Gurney-Smith H.G. and S.C. Johnson 2009. The Myt-OME project: Development of Sensitive Health Assessment Tools for Marine Mussels. Pacific Coast Shellfish Growers Association 63rd Annual Shellfish Conference and Tradeshow, Portland Oregon, USA ,September 29 – October 1, 2009.
6. Booman, M. Hall, J. R., Rise, M. Hori, T. S., Feng, C. Y., Browne, M., Gamperl, A. K., Hubert, S., Kimball, J., Bowman, S., Johnson, S. C., and M. L. Rise. 2009. Functional Genomic Research on Atlantic Cod Peripheral Blood Response to Asymptomatic Nodavirus Infection and Intraperitoneal Viral Mimic (pIC) Injection. 11th International Congress ISDCI 2009. Prague, Czech Republic, June 28 – July 4, 2009.
7. Hori, T.S., Rise, M. L., Afonso, L. O. B., **Johnson, S. C.** and A.K. Gamperl 2009. Advancements in Understanding the Stress Physiology of Atlantic Cod (*Gadus morhua*) American Fisheries Society, Annual General Meeting, Nashville, Tennessee, August 30 - September 3rd, 2009 **Invited Presentation**
8. **Johnson, S. C.** Feng, C. Y., Borza, T., Hori, T. S., Bowman, S., Hall, J. R., Gamperl, A. K., Hubert, S., Kimball, J., Rise, M. and M. L. Rise. 2009. Genomic Approaches to the Study of the Immune System of Atlantic Cod. American Fisheries Society, Annual General Meeting, Nashville, Tennessee, USA, August 30 - September 3rd, 2009 **Invited Presentation**

9. Rise, M. L., Booman, M., Hall, J. R., Rise, M., Hori, T. S., Feng, C. Y., Browne, M., Gamperl, A.K., Hubert, S., Kimball, J., Bowman, S., and S. C. Johnson. 2009. Functional genomic research on Atlantic cod anti-viral immune responses. American Fisheries Society, Annual General Meeting, Nashville, Tennessee, USA, August 30 - September 3rd, 2009 **Invited Presentation**
10. Rise, M.L., Hubert, S., Higgins, B., Borza, T., Kimball, J., Stone, C., Simpson, G., Rise, M., Feng, C. Y., Hori, T. S., Hall, J. R., Gamperl, A. K., Trippel, E., **Johnson, S. C.** and S. Bowman. 2009. Cod Genomics Project. Aquaculture Canada 2009, Nanaimo, Canada, May 10 - 13, 2009. Contributed Talk.
11. Gurney-Smith, H and **S. C. Johnson** 2009. Development of a health assessment tool for marine mussels (*Myt-OME*). Aquaculture Canada 2009, Nanaimo, B.C., May 10 - 13^h, 2009. Contributed Talk.
12. Bowman, S. Hubert, S., Rise, M.L., Higgins. B., Borza, T., Kimball, J., Stone, C., Simpson, G., Rise, M., Feng, C., Hori, T. Hall, J., Trippel E. and **S. C. Johnson**. 2009. Atlantic Cod Genomics: Tools, Resources and Applications. Plant and Animal Genome XVII Conference, San Diego, January 10 -14, 2009. Oral Presentation.
13. Rise, M.L., Johnson, S. C. Feng, C. Y., Hori, T. S. Hall, J.R., Gamperl, A.K. Rise M., Hubert, S., Kimball, J., and S. Bowman. 2009. Functional Genomic Research on Atlantic Cod Immune Responses. Plant and Animal Genome XVII Conference, San Diego, January 10-14th, 2009. Oral Presentation.
14. Bron, J. E., Wyngaard, G.A. and **S. C. Johnson** 2008. Copepod genomics – what can it do for me? 10th International Conference on Copepoda, Pattaya, Thailand, July 13-19, 2008. **Invited Presentation**
15. **Johnson, S. C.**, Borza, T., Hubert, S., Rise, M. L., Stone, C., Kimball, J. and S. Bowman Genomic Tools for Cod Immunological Research: Characterization and Expression of CC Chemokines of the Atlantic Cod (*Gadus morhua*). International Conference on Fish Diseases and Fish Immunology, Reykjavik, Iceland, September 6-9, 2008. Contributed Talk
16. Garcia, A.S., Parrish, C.C. Brown, J.A., **S.C. Johnson** and S. Leadbeater 2008. Effect of dietary DHA, EPA and Arachidonic acid on growth and lipid composition of haddock (*Melanogrammus aeglefinus*) larvae fed enriched *Artemia*. XIII International Symposium on Fish Nutrition and Feeding. Florianopolis, Brazil, June 1-5, 2008. Contributed Talk
17. Hori, T.S.F., Gamperl, A.K., **Johnson, S.C.**, Rise M.L. and L.O.B. Afonso 2008. Divergent stress responsiveness in juvenile Atlantic cod (*Gadus morhua*). 6th International Symposium on Fish Endocrinology. Calgary, June 22-28th, 2008. Contributed Talk

18. Fast, M.D., Tse, B., Boyd, J.M. and **S.C. Johnson** 2008. Mutation within the *Aeromonas salmonicida* type III secretion system affects host leucocyte activation and downstream immune responses. Eastern Fish Health Workshop, Atlantic Beach, North Carolina, March 31 – April 4, 2008. Contributed Talk
19. Hubert, S, **Johnson S.C.**, Rise, M.L., Stone, C., Hall, J., Higgins, B., TarrantBussey, J., Hori, T., Kimball, J. Feng, C., Kozera, C., Borza, T., and S. Bowman 2008. Atlantic Cod (*Gadus morhua*) Genomics in Canada. Plant and Animal Genome XVI Conference, San Diego, January 12-16th, 2008. Poster and Oral Presentation
20. Hori, T.S.F., Kimball, J. **Johnson, S.C.**, Rise, M.L. Gamperl, A.K. Bowman, S. Hubert, S., and L.O.B. Afonso 2008. Heat shock-responsive genes identified and validated in Atlantic cod (*Gadus morhua*) using genomic techniques. Plant and Animal Genome XVI Conference, San Diego, January 12-16th, 2008. Poster and Oral Presentation
21. **Johnson, S.C.** and M.D. Fast 2007. How can genomics, proteomics and metabolomics be used in studies of parasitic copepods? 7th International Symposium on Parasites of Fish, Viterbo, September 24-28th, 2007. **Invited Presentation**
22. Jones, S.R.M., Fast, M.D. and **S.C. Johnson** 2007. Low feed ration has no effect on susceptibility of juvenile pink (*Oncorhynchus gorbuscha*) and chum (*O. keta*) salmon to infestation with *Lepeophtheirus salmonis*. 13th EAAP International Conference on Diseases of Fish and Shellfish, Grado, Italy, September 17-21st, 2007. Contributed Talk.
23. **Johnson, S.C.**, Rise, M.L., Hubert, S., Hall, J.R. and S. Bowman 2007. Development of genomic tools for cod immunological research: The interferon system of the Atlantic cod (*Gadus morhua*). 7th International Symposium on Fish Immunology, Stirling, Scotland, June 18-22nd, 2007. **Invited Presentation**
24. **Johnson, S.C.**, Bowman, S., Hubert, S., Park, K.C., Hall, J.R. and M.L. Rise 2007. Atlantic Cod Genomics: The development of molecular tools for studying the immune system of Atlantic cod (*Gadus morhua*). 13th EAAP International Conference on Diseases of Fish and Shellfish, Grado, Italy, September 17-21st, 2007. Contributed Talk.
25. Manning, A.J., Dacanay, A. and S.C. Johnson 2007. Effects of immunization with T-cell dependent and T-cell independent *Aeromonas salmonicida* antigens on antibody production and immunological memory in cultured Atlantic salmon, *Salmo salar*. 7th Annual General Meeting, NRC Genomics and Health Initiative, Halifax, Nova Scotia, May 22-25th, 2007. Poster

26. Rise, M.L., Bowman, S., Higgins, B., Kozera, C., Stone, C., Kimball, J., Symonds, J. and **S.C. Johnson** 2007. Genomic research on Atlantic cod. Plant and Animal Genome XV Conference, San Diego, California, USA, January 13-17th, 2007. Contributed Talk
27. Boyd, J., Reith, R.K., Singh, B., Bouevitch, C.A. Munholland, J. Murphy, S. Penny, D., Sarty, J. Nash, J., **Johnson, S.C.** and L. Brown. 2007. The genome of *Aeromonas salmonicida* subsp. *salmonicida* A449. American Society for Microbiology, Toronto, Ontario, May 21 – 25th 2007. Contributed Talk
28. Bowman, S., Higgins, B., Stone, C., Kozera, C., Curtis, B. A., Bussey, J.T., Verheul, H. and **S.C. Johnson** 2006. Cod genomics in Atlantic Canada. Aquaculture Canada 2006, Halifax, Nova Scotia, November 19-22th, 2006. Contributed Talk
29. Brown, L.L., Afonso, L.O.B., Ewart, V., Douglas, S. **Johnson, S.C.**, Ross, N., Walter, J. Soo, E. and A. Dacanay 2006. Genomics approaches to understanding host response to bacterial pathogens. International Society for Developmental and Comparative Immunology, Charleston, South Carolina, USA, July 1-6, 2006 **Invited Presentation**
30. Hori, T.S.F., Laing, R. Garrison, L., **Johnson, S.C.**, Gamperl, A.K. and L.O.B. Afonso 2006. The divergent cortisol response of juvenile Atlantic cod (*Gadus morhua*) to handling. APS Intersociety Meeting: Comparative Physiology 2006: Integrating Diversity, Virginia Beach, VA., USA. Oct. 8-11, 2006 Contributed Talk
31. Hori, T.S.F., Afonso, L.O.B., **Johnson, S.C.**, Iwama, G.K. and G. Moraes 2006. Endocrine, metabolic and cellular stress response of matrinxã (*Brycon cephalus*) exposed to phenol. 7th International Congress on the Biology of Fish, St. John's, Newfoundland, Canada. July 19-22, 2006. Poster
32. Bruce, L.D., **Johnson, S.C.**, Gagne, N., Leggiadro, C., Murray, H.M. and L.L. Brown 2006. Identification of nodavirus location within Atlantic cod (*Gadus morhua*) larvae. 5th International Symposium on Aquatic Animal Health, San Francisco, California, USA. Sept. 2-6, 2006. Poster
33. Park, K.C., Osborne, J.A. Nova, B., Figueras, A., Nerland, A.H. Brown, L.L. and **S.C. Johnson** 2006. Expressed sequence tags (ESTs) analysis capturing the transcriptome from host-defense organs (liver, kidney, and gill) of turbot (*Scophthalmus maximus*) infected with nodavirus. 5th International Symposium on Aquatic Animal Health, San Francisco, California, USA. Sept. 2-6, 2006. Contributed Talk
34. Fast, M.D., **Johnson, S.C.**, and R.M. Jones 2006. The effects of diet regime and pathogen challenge on proinflammatory gene expression in juvenile pink *Oncorhynchus gorbuscha* and chum salmon *O. keta*. 5th International Symposium

on Aquatic Animal Health, San Francisco, California, USA. Sept. 2-6, 2006.
Contributed Talk

35. Westelmajer, S.K.M., Brown, J.A., **Johnson, S.C.** and C.C. Parrish 2006. Acute stress tolerance of Atlantic cod larvae fed differentially enriched live food. 7th International Congress on the Biology of Fish, St. John's, Newfoundland, Canada. July 19-22, 2006. Poster
36. Fast, M.D., Sho, H., Afonso, L.O.B. and **S.C. Johnson** 2006. Changes in the immune system of Atlantic salmon (*Salmo salar*) exposed to long-term stress. 7th International Congress on the Biology of Fish, St. John's, Newfoundland, Canada. July 19-22, 2006. Contributed Talk
37. Bruce, L.D., **Johnson, S.C.**, Sperker, S.A. and L.L. Brown 2006. Effects of temperature stress on clinical infections of nodavirus in Atlantic cod (*Gadus morhua*). 7th International Congress on the Biology of Fish, St. John's, Newfoundland, Canada. July 19-22, 2006. Poster
38. Laing, R., Sho, H., **Johnson, S.C.**, Gamperl, A.K. and L.O.B. Afonso 2006. The divergent stress response in juvenile Atlantic cod (*Gadus morhua*) subjected to handling stress. 7th International Congress on the Biology of Fish, St. John's, Newfoundland, Canada. July 19-22, 2006. Poster
39. Sho, H., **Johnson, S.C.**, Gamperl, A.K., Iwama, G.K. Hino, A., and L.O.B. Afonso 2006. The stress response of juvenile haddock (*Melanogrammus aeglefinus*) exposed to long-term stress. 7th International Congress on the Biology of Fish, St. John's, Newfoundland, Canada. July 19-22, 2006. Contributed Talk
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41. Higgins, B., Kozera, C., Curtis, B., Tarrant-Bussey, J., Verheul, H., Parsons, B., Park, K.C., Symonds, J., **Johnson, S.C.** and S. Bowman 2006. Development of genomic resources for Atlantic cod (*Gadus morhua*). 7th International Congress on the Biology of Fish, St. John's, Newfoundland, Canada. July 19-22, 2006. Contributed Talk
42. Fast, M.D., Ross, N.W. and **S.C. Johnson** 2006. *Lepeophtheirus salmonis* secretory components and their effects on salmonid immune gene regulation. 11th International Congress of Parasitology, Glasgow Scotland. Aug. 6-11, 2006.
Invited Presentation
43. Fast, M.D., **Johnson, S.C.** and S. Jones 2006. Differential susceptibility and the response of pink (*Oncorhynchus gorbuscha*) and chum (*O. keta*) salmon juveniles

to infection with *Lepeoptheirus salmonis*. 11th International Congress of Parasitology, Glasgow Scotland. Aug. 6-11, 2006 Contributed Talk

44. Kales, S. Fujiki, K. **Johnson, S.C.** Gamperl, A.K. and B. Dixon 2005. Assessing Immune Gene Expression in Atlantic cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*) under stress and with seasonal changes in temperature. AquaNet 5, Victoria, B.C. Oct. 20-22, 2005. Poster
45. Iwamoto, T. Groman, D. Yason, C. Gagne, N. and **S.C. Johnson** 2005. Evaluation of real-time RT-PCR for detection of Betanodavirus in Atlantic cod and haddock AquaNet 5, Victoria, B.C. Oct. 20-22, 2005. Poster
46. Bricknell, I.R., Bowden, T.J., **Johnson, S.C.** and J.E. Bron 2005. Emergence of disease risks to Gadoids in culture. 12th International EAFP Conference on Fish and Shellfish Diseases, Copenhagen Denmark September 11-16th, 2005. Contributed Talk
47. Bron, J.E., Shinn, A.P., **Johnson, S.C.** and I.R. Bricknell 2005. Parasites of culture Gadoids: Current perspectives and future prospects. 12th International EAFP Conference on Fish and Shellfish Diseases, Copenhagen Denmark September 11-16th, 2005. Contributed Talk
48. Gagné, N., Cook, M., Groman, D., Dixon, B., **Johnson, S.C.**, MacKinnon, A-M and G. Olivier 2005. Nodavirus: status and current research in Atlantic Canada. Aquaculture Canada 2005, St. John's Newfoundland July 3-6th, 2005. Contributed Talk
49. Conejeros, P., Fujiki, K., **Johnson, S.C.** and B. Dixon 2005. Major histocompatibility alleles as a selection marker for nodavirus resistance in Atlantic cod. International Marine Biotechnology Conference, St. John's, Newfoundland June 7-12, 2005. Poster
50. Dixon, B., Parks, J., Nath, S., Kales, S., Schulte, P.M., Brown, L., Fletcher, G., and **S.C. Johnson** 2005. Enhancing understanding of fish immunity through AquaNet networking. International Marine Biotechnology Conference, St. John's, Newfoundland June 7-12, 2005. Invited Presentation
51. **Johnson, S.C.**, Brown, J.A., Brown, L.L., Conejeros, P., Dixon, B., Douglas, S.E., Fujiki, K., Gagné, N., Groman, D., Olivier, G., Murray, H.M., Park, K.C., Perez-Casanova, J.C., and C. Yason 2005. Investigating the Biology, Husbandry and Health of Non-salmonid Finfish. International Marine Biotechnology Conference, St. John's, Newfoundland June 7-12, 2005. Invited Presentation
52. **Johnson S.C.**, Park, K.C., Dacanay, A., and L.L. Brown 2005. Molecular Approaches in Fish Disease Research. International Marine Biotechnology Conference, St. John's, Newfoundland June 7-12, 2005. Poster

53. Murray, H.M., Perez-Casanova, J.C., Gallant, J.W., Ross, N.W., Douglas, S.E. and **S.C. Johnson** 2005. Biochemistry and Molecular Biology: Two Complementary Techniques for Investigating Digestive Capability of Larval Finfish International Marine Biotechnology Conference, St. John's, Newfoundland June 7-12, 2005. Poster
54. Hosoya, S., Afonso, L.O.B., **Johnson, S.C.**, Iwama, G.K. and A.K. Gamperl 2004. Seasonal Effects on Selected Stress Responses of Haddock (*Melanogrammus aeglefinus*) and Atlantic Cod (*Gadus morhua*). AquaNet 4, Quebec City, P.Q. Oct. 19-22, 2004. Poster
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57. Gagné N., **Johnson, S.C.**, Cook-Versloot, M., MacKinnon, A.-M. and G. Olivier 2004. Molecular detection and characterization of Nodavirus in several marine fish species from the north western Atlantic. Gadoid Mariculture: Development and Future Challenges. ICES Symposium, Bergen Norway, June 13-16, 2004. Contributed Talk
58. Brown, L.L., Dacanay, A., Bentley, B.E., Sarty, D. and **S.C. Johnson** 2004. The response of the immune system of haddock (*Melanogrammus aeglefinus*) to vaccination. Gadoid Mariculture: Development and Future Challenges. ICES Symposium, Bergen Norway, June 13-16, 2004. Contributed Talk
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60. Gagné, N., **Johnson S.C.**, Groman, D. Cook, M. and G. Olivier 2003. Molecular detection and characterization of Nodavirus in several marine fish species from Atlantic Canada. AquaNet 3, Vancouver, B.C. Oct. 24-26, 2003. Poster
61. Park K.C., Osborne J.A., Tsoi S.C.M., Brown L.L. and **S.C. Johnson** 2003. The use of expressed sequence tags and microarray analysis to study the response of Atlantic halibut (*Hippoglossus hippoglossus* L.) to vaccination against *Vibrio*

anguillarum and *Aeromonas salmonicida*. AquaNet 3, Vancouver, B.C. Oct. 24-26, 2003. Contributed Talk

62. Perez-Casanova, J.C., Murray, H.M., Gallant, J.W., Ross, N.W., Douglas S. and **S.C. Johnson** 2003. V The digestive proteases and α -amylase of the haddock (*Melanogrammus aeglefinus*) and Atlantic cod (*Gadus morhua*) during larval development. AquaNet 3, Vancouver, B.C. Oct. 24-26, 2003. Poster
63. Perez-Casanova, J.C., Murray, H.M., Gallant, J.W., Ross, N.W., Douglas S. and **S.C. Johnson** 2003. Development of bile salt-activated lipase and general lipase activity in Atlantic Cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*) larvae. AquaNet 3, Vancouver, B.C. Oct. 24-26, 2003. Poster
64. Park, K.C., Osborne, J.A., Penny, L.L., Brown, L.L. and **S. C. Johnson** 2003. Microarray analysis of gene expression in the liver of Atlantic Halibut vaccinated with *Vibrio anguillarum* and *Aeromonas salmonicida*. EAAP 11th International Conference of Diseases of Fish and Shellfish, Malta, Sept. 21-26, 2003. Contributed Talk
65. Park, K.C., Osborne, J.A., Tsoi, S.C.M., Brown, L.L. and **S.C. Johnson** 2003. Expressed sequence tags of the Atlantic halibut (*Hippoglossus hippoglossus* L.). EAAP 11th International Conference of Diseases of Fish and Shellfish, Malta, Sept. 21-26, 2003. Poster
66. Fast, M.D., **Johnson, S.C.**, Burka, J.F. and N.W. Ross 2003. Differences in comparative susceptibility and its relationship to possible immunomodulatory compounds secreted by *Lepeophtheirus salmonis*. 6th International Conference on Sea Lice, St. Andrews, N.B. July 2-5, 2003. Contributed Talk
67. McKenzie, H., Dacanay, A., Osborne, J.A., Brown, L.L. and **S. C. Johnson** 2003. Immunoglobulin diversity in *Aeromonas salmonicida*-exposed Atlantic salmon (*Salmo salar*, L.); an immunomic view. APICS Aquaculture Conference, Halifax, March 7-9, 2003. Contributed Talk
68. Murray, H.M., Perez-Casanova, J.C., Gallant, J.W., Ross, N.W., Douglas, S.E. and **S. C. Johnson** 2003. The digestive capability of larval gadids: The haddock (*Melanogrammus aeglefinus*) and the Atlantic cod (*Gadus morhua*). World Aquaculture 2003, Slavador Brazil, May 19-23, 2003. Contributed Talk
69. **Johnson, S.C**, Bentley, B.E., Dacanay, A., Park, K.C. and L.L. Brown 2003. Fish health research activities on haddock (*Melanogrammus aeglefinus*), Atlantic halibut (*Hippoglossus hippoglossus*) and Atlantic cod (*Gadus morhua*) in Eastern Canada. World Aquaculture 2003, Slavador Brazil, May 19-23, 2003. Invited Talk
70. Ucán- Marín, F., Ernst, W., O' Dor, R., Pinder A., Sherry, J. and **S.C. Johnson** 2002. Endocrine disrupter effect of ivermectin on Atlantic salmon, (*Salmo salar*).

35th Annual Symposium. Toxicology of Sensitive Populations, Society of Toxicology of Canada. Montreal, PQ, Dec. 5-6, 2002. Poster

71. Murray, H.M., Casanova, J.C., Gallant, J.W., Douglas, S. and **S.C. Johnson** 2002. Digestive enzyme expression in the exocrine pancreas during the ontogeny of the winter flounder (*Pseudopleuronectes americanus*). AquaNet 2, Moncton, N. B. Sept. 14 – 17, 2002. Poster
72. Perez Casanova, J.C. Murray H.M., Ross N.W., Douglas S. and **S.C. Johnson** 2002. Ontogeny of digestive capability in haddock (*Melanogrammus aeglefinus*) and Atlantic cod (*Gadus morhua*) larvae. AquaNet 2, Moncton, N. B. Sept. 14 – 17, 2002. Poster
73. Park, K.C., Osborne, J.A., Tsio, S.C.M., Brown, L.L. and **S.C. Johnson** 2002. The development of expressed sequence tags and a cDNA microarray for studying the immune responses of Atlantic halibut (*Hippoglossus hippoglossus* L.). AquaNet 2, Moncton, N. B. Sept. 14 – 17, 2002. Poster
74. **Johnson, S.C.**, Frantsi, C., Lanteigne, C., Leadbeater, S., Melanson, R., van der Meer, D., Martin-Robichaud, D. and P. Rose 2002. Development of haddock *Melanogrammus aeglefinus* culture in Atlantic Canada. Annual Meeting of the Aquaculture Association of Canada, Charlottetown, PEI, Sept 17-20, 2002. Invited Talk
75. Dacanay, A., Cusack, R.R., **Johnson, S.C.** and L.L. Brown 2002. *Salmo salar* mortality and the outbreak of a parasitic (*Apiosoma* sp.) disease following a chlorine stressor. Annual Meeting of the Aquaculture Association of Canada, Charlottetown, PEI, Sept 17-20, 2002. Contributed Talk
76. **Johnson, S.C.**, Bravo, S., Treasurer, J.W., Nagasawa, K. and Z. Kabata 2002. A review of the impacts of parasitic copepods on marine aquaculture. 8th International Conference on Copepoda. National Taiwan Ocean University, Keelung, Taiwan, July 21-26, 2002. Invited Talk
77. **Johnson, S.C.** 2002. New developments in our understanding of host-parasite interactions between the salmon louse, *Lepeophtheirus salmonis* and its hosts. American Physiological Society Intersociety Meeting, The Power of Comparative Physiology, San Diego, USA, August 24-28, 2002. Invited Talk
78. Park, K.C., Osborne, J.A., Tsio, S.C.M., Brown, L.L. and **S.C. Johnson** 2002. The development of expressed sequence tags and a cDNA microarray for studying the immune responses of Atlantic halibut (*Hippoglossus hippoglossus* L.). International Symposium of Aquatic Animal Health, New Orleans, Sept 1 – 5, 2002. Poster
79. Bentley, B.E., Dacanay, A. Brown, L.L. and **S.C. Johnson** 2002. The lack of a specific antibody response in haddock (*Melanogrammus aeglefinus*)

immunoglobulin quaternary structure and proteomic diversity. International Symposium of Aquatic Animal Health, New Orleans, Sept 1 – 5, 2002. Contributed Talk

80. Casanova, J.C., Murray, H.M., Gallant, J.W., Douglas, S. Ross, N.W. and **S.C. Johnson** 2002. Ontogeny of digestion in larval Atlantic cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*). International Congress on the Biology of Fish. Vancouver, British Columbia, July 21 - 26, 2002. Poster
81. Murray, H.M., Casanova, J.C., Gallant, J.W., Douglas, S. and **S.C. Johnson** 2002. Digestive enzyme expression in the exocrine pancreas during the ontogeny of the winter flounder (*Pseudopleuronectes americanus*). International Congress on the Biology of Fish. Vancouver, British Columbia, July 21 - 26, 2002. Contributed Talk
82. Dacanay, A., Bentley, E.B., Brown, L.L. and **S.C. Johnson** 2002. Studies of immunoglobulin structure and diversity in non-salmonid marine fish 27th Annual Eastern Fish Health Workshop. Charleston, South Carolina, March 18 – 22, 2002. Contributed Talk
83. Perez Casanova, J.C., Murray, H.M., Ross, N.W., Douglas, S. and **S.C. Johnson** 2002. The Development of Digestive Ability in Larvae of Haddock (*Melanogrammus aeglefinus*). APICS Aquaculture Conference, Université de Moncton, Moncton, N.B., March 8 - 10, 2002. Contributed Talk
84. Ash, K.V., Park, K.C., Osborne, J.A., Brown, L.L. and **S.C. Johnson** 2002. Localization and Expression of Transforming Growth factor – β (TGF- β) in Atlantic halibut (*Hippoglossus hippoglossus*). APICS Aquaculture Conference, Université de Moncton, Moncton, N.B., March 8 - 10, 2002. Contributed Talk
85. Sperker, S.A., Osborne, J.A., Brown, L.L. and **S.C. Johnson** 2001. Constitutive gene expression in kidney and spleen of Atlantic halibut (*Hippoglossus hippoglossus*) and haddock (*Melanogrammus aeglefinus*). AquaNet 1, Halifax, N. S. Sept. 29 – Oct. 3, 2001. Poster
86. Park, K.C., Osborne, J.A., Tsoi, S., Brown, L.L. and **S.C. Johnson** 2001. Investigations of the immune system of Atlantic halibut (*Hippoglossus hippoglossus*) using expressed sequence tags (ESTs). AquaNet 1, Halifax, N. S. Sept. 29 – Oct. 3, 2001. Poster
87. Bentley, B.E., Dacanay, A., Brown, L.L. and **S.C. Johnson** 2001. Immunoglobulin structure and diversity in vaccinated haddock (*Melanogrammus aeglefinus*). AquaNet 1, Halifax, N. S. Sept. 29 – Oct. 3, 2001. Poster
88. Perez Casanova, J.C., Murray, H.M., Ross, N.W., Douglas, S. and **S.C. Johnson** 2001. The Development of Digestive Ability in Larvae of Haddock (*Melanogrammus aeglefinus*). AquaNet 1, Halifax, N. S. Sept. 29 – Oct. 3, 2001. Poster

89. Murray, H.M., Perez-Casanova J., Ross, N.W., Douglas S.E. and **S.C. Johnson** 2001. The Development of Digestive Ability in Larvae of Haddock (*Melanogrammus aeglefinus*) and Atlantic cod (*Gadus morhua*). AquaNet 1, Halifax, N. S. Sept. 29 – Oct. 3, 2001. Poster
90. Gillett, D.T., Bentley, B.E., Greenwell, M., Brown, L.L. and **S.C. Johnson** 2001. The efficacy of vaccination of haddock (*Melanogrammus aeglefinus*) against infection with the bacterial pathogen *Vibrio anguillarum*. AquaNet 1, Halifax, N. S. Sept. 29 – Oct. 3, 2001. Poster
91. Gillett, D.T., Osborne, J.A., Sperker, S.A., Brown, L.L. and **S.C. Johnson** 2001. Characterization and Expression of the Recombination Activating Genes (RAG1 and RAG2) of Halibut (*Hippoglossus hippoglossus*). AquaNet 1, Halifax, N. S. Sept. 29 – Oct. 3, 2001. Poster
92. **Johnson, S.C.**, Groman, D.B. Cusack, R.R., Sperker, S.A., Leggiadro, C.T., Ritchie, R. and M.D. Cook 2001. Identification and characterization of a piscine neuropathy nodavirus from juvenile Atlantic cod (*Gadus morhua*). European Association of Fish Pathologists, Tenth International Conference of Diseases of Fish and Shellfish, Dublin, Ireland, . September 10-14, 2001. Poster
93. Murray, H.M. Casanova, J., Leggiadro, C.T., Gallant, J., Douglas, S. and **S. C. Johnson** 2001. Gene expression and biochemical activity of various digestive enzymes during larval development in Atlantic cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*). Larvi 2001, University of Ghent, Belgium. Sept. 3-6, 2001. Poster
94. Perez Casanova, J.C., Murray, H.M., Ross, N.W., Douglas, S. and **S.C. Johnson** 2001. The development of digestive ability in larvae of haddock (*Melanogrammus aeglefinus*). Aquaculture Canada, 2001, Halifax, N.S. May 6-9, 2001. Poster
95. **Johnson, S.C.**, Groman, D.B. Cusack, R.R., Sperker, S.A., Leggiadro, C.T., Ritchie, R. and M.D. Cook 2001. Identification and characterization of a piscine neuropathy nodavirus from juvenile Atlantic cod (*Gadus morhua*). Aquaculture Canada, 2001, Halifax, N.S. May 6-9, 2001. Contributed Talk
96. Murray, H.M., Leggiadro, C.T., Gallant, J., **Johnson, S.C.**, and S. Douglas 2001. Use of winter flounder molecular probes to investigate digestion in other marine fishes. Aquaculture Canada, 2001, Halifax, N.S. May 6-9, 2001. Contributed Talk
97. Fast, M.D., Burka, J.F., **Johnson, S.C.** and N.W. Ross 2001. Sea lice (*Lepeophtheirus salmonis*) secretions in the presence of salmonid mucus. Aquaculture Canada, 2001, Halifax, N.S. May 6-9, 2001. Contributed Talk

98. Roberts, A., Bentley E., Brown, L., Dacanay A., Gillett, D. and **S.C. Johnson** 2001. Investigations into haddock immunoglobulin. Aquaculture Canada, 2001, Halifax, N.S. May 6-9, 2001. Contributed Talk
99. Dacanay, A., Bjornsdottir, R., Brown, L. and **S.C. Johnson** 2001. Quantitative analysis of superoxide dismutase in *Aeromonas salmonicida salmonicida*: re-evaluation of its role in virulence. Aquaculture Canada, 2001, Halifax, N.S. May 6-9, 2001. Contributed Talk
100. Dacanay, A., Bjornsdottir, R., Brown, L. and **S.C. Johnson** 2001. Quantitative analysis of superoxide dismutase in *Aeromonas salmonicida salmonicida*: re-evaluation of its role in virulence. Annual Eastern Fish Health Workshop. Shepherdstown April 23-26, 2001. Contributed Talk
101. Bentley E., Brown, L., Dacanay A., Gillett, D., **Johnson S.C.** and A. Roberts 2001. Investigations into haddock immunoglobulin. Annual Eastern Fish Health Workshop. Shepherdstown April 23-26, 2001. Contributed Talk
102. **Johnson, S.C.**, Dacanay, A., Douglas, S., Reith, M., Ewart, V., Ross, N., Sensen, C., Singh, R., Han, Y., Tsoi, S., Boyd, J., Nesati, V., Ebanks, R. and L.L. Brown 2001. Molecular Approaches to Fish Health – *the Aeromonas salmonicida / Salmo salar* Model System. Annual Eastern Fish Health Workshop. Shepherdstown April 23-26, 2001. Contributed Talk
103. Burka, J.F., Conboy, G.A., Sims, D.E., Speare, D.J., Mustafa, A., Ross, N.W. and **S.C. Johnson** 2000. Physiological, biochemical, and histological approaches to examine sea lice-salmon interactions. Proceedings of the International Congress on the Biology of Fish. Aberdeen, UK. July 23-27, 2000. Poster
104. Gillett, D. and **S.C. Johnson** 2000. The effect of body size on the antibody response of haddock (*Melanogrammus aeglefinus*). Aquaculture Canada, 2000, Moncton, N.B. May 28-31, 2000. Poster
105. **Johnson, S.C.**, van der Meer, D.J., Leggiadro, C.T., Leadbeater, S.A., Melanson R. J. and S.P. Lall 2000. The effects of different feeding regimes on haddock (*Melanogrammus aeglefinus*) larval development and survival. Aquaculture Canada, 2000, Moncton, N.B. May 28-31, 2000. Contributed Talk
106. **Johnson, S.C.**, Ewart, K.V., Osborne, J.A., Fast, M.D. and N.W. Ross 2000. Molecular cloning and sequencing of trypsin-like cDNAs from the salmon louse, *Lepeophtheirus salmonis* and the role of these enzymes in the host-parasite relationship. Canadian Society of Zoologists Meeting, St. Andrews, N.B. May, 3-6, 2000. Contributed Talk

107. **Johnson, S.C.**, Lanteigne, C. Lall, S.P. and C. Frantsi 2000. Development of haddock aquaculture in Atlantic Canada. NRC-Wide Research and Technology Development Forum, Magog, QC., April 18-20, 2000. Poster
108. **Johnson, S.C.**, Blanchard, B.C., Lanteigne, C., Lall, S. and C. Frantsi 1999. Development of haddock (*Melanogrammus aeglefinus*) aquaculture in Atlantic Canada. Aquaculture Canada, 99, Victoria, B. C. Oct. 26-29, 1999. Contributed Talk
109. **Johnson, S.C.**, Ewart, V.K. and N.W. Ross, 1999. New developments in our understanding of the biology and control of the salmon louse, *Lepeophtheirus salmonis*. Aquaculture Canada, 99, Victoria, B. C. Oct. 26-29, 1999. Contributed Talk
110. Ewart, K.V., **Johnson, S.C.**, Ross, N.W., Ottinger, C.A., Richards, R., and L.L. Brown 1999. Investigation of a pathogen-binding lectin from Atlantic salmon serum. ICES Meeting, St. Andrews, New Brunswick. Sept. 15-17, 1999. Contributed Talk
111. **Johnson, S.C.**, Blanchard, B.C. and S. Lall 1999. Development of Cold Water Fish Species for use in Aquaculture in Atlantic Canada. FOID, Pusan, South Korea, Aug. 25-26, 1999. Invited Talk
112. **Johnson S.C.**, Ewart, K.V., Osborne, J.A., Stratton L., Ross N.W. and S. MacIntosh 1999. Expressed sequence tags (ESTs) from the sea louse *Lepeophtheirus salmonis* and study of trypsin cDNAs. Fifth International Congress of Comparative Physiology and Biochemistry. Calgary, AB, Aug. 23-28, 1999. Poster
113. **Johnson, S.C.**, Ewart, V.K., Osborne, J.A., Firth, K.J., Brown, L.L., and N.W. Ross 1999. Host parasite interactions between the salmon louse *Lepeophtheirus salmonis* and Atlantic salmon. European Association of Fish Pathologists, Ninth International Conference of Diseases of Fish and Shellfish, Rhodes, Greece, . September 19-24, 1999. Poster
114. **Johnson, S.C.**, Ewart, V.K., Osborne, J.A., and N.W. Ross 1999. Expressed sequence tags of the salmon louse *Lepeophtheirus salmonis* and characterization of trypsin and trypsin-related enzymes. 4th International Conference on Sea Lice, Dublin, Ireland, June 28- 30, 1999. Contributed Talk
115. Ewart, K.V., Ottinger, C.A., Ross, N.W., Brown, L.L., and **S.C. Johnson** 1998. Structural and functional characterization of a mannose binding lectin from the serum of Atlantic salmon (*Salmo salar*). Third International Symposium on Aquatic Animal Health, Baltimore, August 30-September 3, 1998. Contributed Talk
116. Ottinger, C.A., Brown, L.L., Ross, N.W. and **S.C. Johnson** 1998. . Multiparameter cell-cycle analysis of Atlantic salmon peripheral blood leukocytes. Third International

Symposium on Aquatic Animal Health, Baltimore, August 30-September 3, 1998.
Contributed Talk

117. Ottinger, C.A., **Johnson, S.C.**, Ewart, K.V. and N.W. Ross 1998. Lectin enhancement of anti-*Aeromonas salmonicida* activity of Atlantic salmon macrophages. 23 Annual Eastern Fish Disease Workshop, Plymouth, March 31-April 2, 1998. Contributed Talk
118. Ottinger, C.A., Brown, L.L., Ross, N.W. and **S.C. Johnson** 1998. Multiparameter cell-cycle analysis of Atlantic salmon peripheral blood leukocytes. 23 Annual Eastern Fish Disease Workshop, Plymouth, March 31-April 2, 1998. Contributed Talk
119. Firth, K. J., **Johnson, S.C.** and N.W. Ross 1998. Investigation of the role of skin mucus proteases of Atlantic salmon during *Lepeophtheirus salmonis* infestation. Second International Workshop on Sea Lice Biology. Amsterdam, July 22-24, 1998. Contributed Talk
120. Firth, K.J., **Johnson, S.C.** and N.W. Ross 1998. Characterisation of proteases in the skin surface mucus of Atlantic salmon infested with *Lepeophtheirus salmonis*. APICS 1998 Conference, Halifax, March 6-8, 1998. Contributed Talk
121. Ross, N.W., Ottinger, C.A., Firth, K. J., Wang, A. and **S.C. Johnson** 1998. Biochemical and immunological interactions between Atlantic salmon and the salmon louse *Lepeophtheirus salmonis*. Second International Workshop on Sea Lice Biology. Amsterdam, July 22-24, 1998. Contributed Talk
122. Ross, N.W., Ewart, K.V. and S.C. Johnson 1998. Purification and characterization of a mannose-binding serum lectin from Atlantic salmon. 23rd Annual Eastern Fish Health Workshop, Plymouth, MA, USA, March 30-April 2, 1998. Contributed Talk
123. Firth, K. J., **Johnson, S.C.**, Burka, J. F. and N.W. Ross 1997. Interactions between Atlantic salmon and the salmon louse *Lepeophtheirus salmonis*. Third International Symposium on Research for Aquaculture: Fundamental and Applied Aspects. Barcelona, August 24-27, 1997. Contributed Talk
124. Ewart, K.V., Ross, N.W. and **S.C. Johnson** 1997. Soluble lectins in the serum of Atlantic salmon (*Salmo salar*) and their interactions with pathogenic bacteria. International Marine Biotechnology Conference, Sorrento, Italy. September 22-29, 1997. Poster
125. Firth, K. J., Ross, N.W., Burka, J. F. and **S.C. Johnson** 1997. Protease activity in the mucus of Atlantic salmon infected with the salmon louse, *Lepeophtheirus salmonis*. Aquaculture Canada 1997, Quebec City, Quebec, June 1997. Contributed Talk
126. Firth, K. J., **Johnson, S.C.**, Burka, J.F. and N.W. Ross 1997. Investigation of the role of skin mucous proteases of Atlantic salmon during sea lice (*Lepeophtheirus salmonis*)

infestation. The Atlantic Universities Aquaculture Conference 1997, Nova Scotia Agricultural College, Truro, Nova Scotia, March 1997. Contributed Talk

127. **Johnson, S.C.** 1996. Biotechnology a potential tool for the control of sea lice on farmed salmonids. Bio Atlantech, Fredericton, New Brunswick, October 1996. Invited Talk
128. **Johnson, S.C.**, Blaylock, R.B., Elphick, J. and K. Hyatt 1995. Sea lice disease in wild sockeye salmon (*Oncorhynchus nerka*) stocks of Alberni Inlet, British Columbia, Canada. Fourth International Symposium of Ichthyoparasitology, Munich, Germany, October 1995. Contributed Talk
129. **Johnson, S.C.** 1993. Effects of host on the biology of the parasitic copepod, *Lepeophtheirus salmonis*. Fifth International Conference on Copepoda, Baltimore, June, 1993. Poster
130. **Johnson, S.C.** and L. Margolis 1993. Host effects on egg production, development, and growth of the parasitic copepod *Lepeophtheirus salmonis*. Canadian Society of Zoologists Meeting, Guelph, May, 1993. Poster
131. **Johnson, S.C.** and L.J. Albright 1992. Comparative susceptibility and histopathology of the host response of naive Atlantic, chinook, and coho salmon to experimental infection with *Lepeophtheirus salmonis* (Copepoda: Caligidae). First European Conference on Crustacea, Paris, September, 1992. Contributed Talk
132. **Johnson, S.C.**, Albright, L.J. and Z. Kabata 1989. Development of *Lepeophtheirus salmonis* (Copepoda: Caligidae). 64th Annual Meeting of the American Society of Parasitologists. Vancouver, August, 1989. Poster
133. Albright, L.J., Nikl, L., **Johnson, S.C.**, Pearse, G. and K. Mesa 1988. What concentrations of *Chaetoceros convolutus* are harmful to farmed salmonids? Aquaculture International Congress and Exposition, Vancouver. Contributed Talk
134. **Johnson, S.C.** and R.E. Scheibling, 1984. Species composition and abundance of harpacticoid copepods on intertidal macroalgae, *Fucus vesiculosus* and *Ascophyllum nodosum*, off Nova Scotia. Second International Conference on Copepods, Ottawa. Poster

THESES

- Johnson, S. C.**, 1991. The biology of *Lepeophtheirus salmonis* (Krøyer, 1837) (Copepoda: Caligidae). Ph.D. Thesis, Simon Fraser University, Burnaby, British Columbia.

Johnson, S. C., 1986. Epifaunal assemblages of intertidal rockweeds *Ascophyllum nodosum* and *Fucus vesiculosus* in Nova Scotia, Canada. M.Sc. Thesis, Dalhousie University, Halifax, Nova Scotia.