Curriculum Vitae for Kristina M. Miller

IDENTIFICATION

Surname: Miller **Given name(s)** : Kristina Marie

Title: Head, Molecular Genetics

Department: Science Branch/Salmon and Freshwater Ecosystems Division, Molecular Genetics Section

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EDUCATION AND RESEARCH TRAINING

Degree	Year	Discipline/Field	Supervisor	Department, Institution and Country
B.Sc	1983	Biology		University of California, Davis
M.Sc	1986	Zoology	Tom Carefoot	University of British Columbia
Ph.D	1992	Biological Sciences	John Roughgarden	Stanford University

AREA(S) OF EXPERTISE

Molecular ecology, evolution and genetics, Adaptive immunity in teleost fishes, Major Histocompatibility Complex, Microarrays, Gene expression profiling, Functional genomics, Salmon Migration Physiology, Microsatellite DNA, Genetic species/stock identification, Microbial profiling

ACADEMIC, RESEARCH, PROFESSIONAL AND INDUSTRIAL EXPERIENCE –

Position Held	Institution/Organization, Country	Department/Faculty	Period year to year	
Adjunct Professor	University of British Columbia	Department of Forest Sciences	2008	Present
Head, Molecular Genetics	Fisheries and Oceans, Canada	Science Branch/Salmon and Freshwater Ecosystems Division/Molecular Genetics	2004	Present
Research Scientist	Fisheries and Oceans, Canada	Science Branch/Aquaculture Division/Molecular Genetics	1995	2004
Postdoctoral Fellow	Fisheries and Oceans, Canada	Science Branch/Aquaculture Division/Molecular Genetics	1993	1995

General Description of Dr. Miller's research interests:

As Head of Molecular Genetics Section at the Pacific Biological Station in Nanaimo BC, Dr. Miller supervises a staff of 22, including two research scientists, three biologists, a bioinformatician, and 16 technical staff. As well, she has co-supervised students from UBC, Memorial University, Laval, and SFU, and is an adjunct Professor in the Department of Forest Sciences at UBC. Her diverse research program centered on molecular population genetics and genomics of aquatic organisms has developed applied molecular tools and databases for management and conservation of aquatic resources. Specific research has included population genetics of a wide variety of fish and shellfish species (primarily based on microsatellite DNA), adaptive molecular variation of major histocompatibility complex genes in fish, scat analysis in Stellar Sea Lions (collaboration with UBC), microbial profiling of sockeye salmon lakes and aquaculture facilities, and salmonid functional genomics research including host response to disease and migration physiology. Applied tools and technology from research within her group include genetic stock identification in salmon—with over 15K fish analysed in-season per year for conservation-based fisheries management, species ID tools in abalone, salmon and rockfish—used in forensic cases and in scat analysis, delineation of management and conservation units for aquatic species based on genetic data, development of probiotics, and development of quantitative (PCR) tests for *Kudoa thyrsites* and the IHN virus. Her genomics program is currently developing biomarkers associated with health and condition of wild migrating salmon for applications in fisheries management.

Specific Expertise relating to host immunity and disease:

Dr. Miller developed an interest in immunology and host immunity during her PhD at Stanford, where she spent part of her time and research in the immunology laboratory of Patricia Jones. In the mid 1990's, Dr. Miller began conducting molecular research on the major histocompatibility complex (MHC), a complex of genes with a crucial role in the recognition of self and non-self and under a high degree of pathogen-driven selection. She is one of the foremost world experts on the MHC of salmon and Atlantic cod, and serves as MHC subject editor for the international journal Immunogenetics. Host response to disease was a specific interest in the development of the genomics program in the mid 2000's, with the first studies profiling the salmonid host response to the IHN virus (see below). Dr. Miller has also developed quantitative molecular markers for *Kudoa thyrcites*, the IHN virus, and recently a novel salmon parvovirus, and has developed probiotics to enhance the health of marine shellfish larvae and juveniles.

- **Major RESEARCH CONTRIBUTIONS SINCE 2001 –**

    1. **Functional Genomics and Sockeye salmon Migration Physiology**. Dr. Miller developed a functional genomics laboratory in 2004 and has been applying cDNA microarray technology on salmon since that time. She currently leads a large multidisciplinary project entitled "Genomic Tools for Fisheries Management" co-funded by Genome BC, DFO Genomics Research and Development Initiative, NSERC and the PSC which assesses genome-wide physiology in wild migrating sockeye, coho and Chinook salmon smolts and adults, with the goal to identify profiles associated with poor performance. This program has uncovered striking new information on physiological

variation in salmon during these transition periods, and by combining genomics and radio tracking, they have identified a novel signature (proposed to result from a viral infection) associated with and predictive of premature mortality of adults returning to the Fraser river to spawn (Miller et al. 2011).

Miller, K.M., Li, S, Kaukinen, K.H., Ginther, N., Hammill, E., Curtis, J.M.R., Patterson, D.A., Sierocinski, T., Donnison, L., Pavlidis, P., Hinch, S.G., Hruska, K.A., Cooke, S.J., English, K.K., and Farrell, A.P. 2011. Genomic signatures predict migration and spawning failure in wild Canadian salmon. Science: 331: 214-218.

2. **Relationship between susceptibility and host response to the IHN virus in salmon**. This research was undertaken to gain a better understanding of the molecular controls of host susceptibility to the IHN virus. CDNA microarray experiments were run on five species of salmon exposed to the IHN virus that contain different levels of susceptibility to disease caused by the virus. The experiments showed that the most susceptible species responded most vigorously to the virus, using multiple innate pathways of defence, and culminating in a strong cellular immune response. Given that there was no upregulation in intracellular-mediated response in the least susceptible species, it appeared that differences in susceptibility were likely related to the efficiency of the viral receptor. A number of genes potentially co-opted by the virus were uncovered, as were pathways associated with better disease outcomes.

Miller, KM, G Traxler, KH Kaukinen, S Li, J Richard and N Ginther. A cDNA microarray study of Atlantic salmon (*Salmo salar*) response to Infectious Hematopoietic Necrosis (IHN) virus. Aquaculture 272 (Supplement 1): S217-S237.

3. **Adaptive MHC variation in salmonids**. Dr. Miller has conducted research on salmonid MHC variation in wild populations for over 15 years. In this time, she has demonstrated that selection overrides migration and drift in the generation and maintenance of variation of MHC loci in salmon. However, contrary to findings in most species, some populations are under strong directional selection at MHC, while other populations show the typical patterns of variation associated with balancing selection. She demonstrated that in salmon, MHC loci can be associated with disease susceptibility (e.g. the IHN virus), but are also important in kin discrimination. Furthermore, in 2006, she published a manuscript that identified a number of novel MHC class I loci in salmon from two linkage groups. The MHC work in Dr. Miller's lab is not only used to answer important ecological questions, but is routinely applied in conservation-based management through the stock ID program.

Multiple publications below

In Press:

Jeffries, K.M., Hinch, S.G., Donaldson, M.R., Gale, M.K., Burt, J.M., Farrell, A.P., Patterson, D.A., **Miller**, K.M. Temporal changes in blood variables during final maturation and senescence in male sockeye salmon *Oncorhynchus nerka* (Walbaum): reduced osmoregulatory ability can predict mortality. Journal of Fish Biology, in press.

Evans, T, E. Hammill, K. Kaukinen, A Schulze, D. Patterson, K. English, J. Curtis, K. **Miller**. Transcriptomics of environmental acclimatization and survival in wild adult Pacific sockeye salmon (Oncorhynhchus nerka) during spawning migration. Molecular Ecology: In Press.

Refereed Journal Publications (since 2000)

McClelland, E.K., T.J. Ming, A. Tabata, K.M. **Miller**. 2011. Sequence analysis of MHC class I α2 from sockeye salmon (Oncorhynchus nerka). Fish and Shellfish Immunol. Doi: 10.1016/j.fsi.2011.06.012.

Evans, M.L., M. Dionne, K.M. **Miller**, L Bernatchez. 2011. Mate choice for major histocompatibility complex genetic divergence as a bet-hedging strategy in the Atlantic salmon (Salmo salar). Proc. R. Soc. B: doi: 10.1098/rspb.2011.0909.

Miller, K.M., Li, S, Kaukinen, K.H., Ginther, N., Hammill, E., Curtis, J.M.R., Patterson, D.A., Sierocinski, T., Donnison, L., Pavlidis, P., Hinch, S.G., Hruska, K.A., Cooke, S.J., English, K.K., and Farrell, A.P. 2011. Genomic signatures predict migration and spawning failure in wild Canadian salmon. Science: 331: 214-218.

Donaldson, M.R., Hinch, S.G., Patterson, D.A., Farrell, A.P., Shrimpton, J.M., **Miller**-Saunders, K.M., Robichaud, D., Hills, J., Hruska, K.A., Hanson, K.C., English, K.K., Van Der Kraak, G., and Cooke, S.J. 2010. Physiological condition differentially affects the behaviour and survival of two populations of sockeye salmon during their freshwater spawning migrations. Physiological and Biochemical Zoology 83: 446-458.

Martins, E.G., S.G. Hinch, D.A. Patterson, M.J. Hague, S.J. Cooke, K.M. **Miller**, M.F. Lapointe, K.K. English, A.P Farrell. 2010. Effects of river temperature and climate warming on stock-specific survival of adult migrating Fraser River sockeye salmon (*Oncorhynchus nerka*). Global Change Biology 17: 99-114.

Miller, K.M., A.D. Schulze, N. Ginther, S. Li, D.A. Patterson, A.P. Farrell, S.G. Hinch. 2009. Salmon Spawning Migration: Metabolic Shifts and Environmental Triggers. Comp. Biochem Physiol D 4: 75-89.

Hinch, S.G., A.P. Farrell, S.J. Cooke, D.A. Patterson, M.F. Lapointe, D.W. Welch, K.K. English, G.T. Crossin, K. Miller, R.E. Thomson, G. Van Der Kraak, I. Olssen, M. Shrimpton, and M.S. Cooperman. 2009. Using physiological telemetry and intervention experiments to examine the maladaptive shift in Fraser River's Late-Run Sockeye Salmon spawning migration. American Fisheries Society Symposium 69:891-894.

Dionne, M., K.M. **Miller**, J.J. Dodson, and L. Bernatchez. 2009. MHC standing genetic variation and pathogen resistance in wild 1 Atlantic salmon. Philosophical Transactions of the Royal Society of London B. 364: 1555-1565.

Tollit, D. J., A. D. Schulze, A. W. Trites, T.F. Olesiuk, S. J. Crockford, T. S. Gelatt, R. R. Ream, and K. M. **Miller**. 2009. Development and application of DNA techniques for validating and improving pinniped diet estimates. Ecological Applications 19(4): 889-905.

Beacham, T. D., K. D. Le, M. Wetklo, B. McIntosh, T. Ming, and K. M. **Miller**. 2009. Population structure and stock identification of chum salmon from western Alaska determined with microsatellite and major histocompatibility complex variation. Pages 141-160. In C. C. Krueger, and C. E. Zimmerman, editors. Pacific Salmon: Ecology and Management of Western Alaska's Populations. American Fisheries Society, Symposium 70, Bethesda, Maryland.

Winans, G.A., M. L. McHenry, J. Baker, A. Eiz, A. Goodbla, E. Iwamoto, E. Kuligowski, K.M. **Miller**, M.P. Small, P. Spruell, and D. Van Doornik. 2008. Genetic inventory of anadromous Pacific salmonids of the Elwha River prior to dam removal. Northwest Science 82: 128-141.

Beacham, T. D., K. J. Supernault, and K. M. **Miller**. 2008. Population structure of Dungeness crab (*Cancer magister*) in British Columbia. Journal of Shellfish Research 27(4): 901-906.

Cooke, S.J., S.G. Hinch, A.P. Farrell, D.A. Patterson K. **Miller**-Saunders, D.W. Welch, M.R. Donaldson K.C. Hanson, G.T. Crossin, M.T. Mathes et al. 2008. Developing a mechanistic understanding of fish migrations by linking telemetry with physiology, behaviour, genomics and experimental biology: an interdisciplinary case study on adult Fraser River sockeye salmon. Fisheries 33(7) 321-338.

Narum, S. R. , M. Banks, T. Beacham, R. Bellinger, M. Campbell, J. DeKoning, A. Elz, C. Guthrie, C. Kozfkay, K. **Miller**, P. Moran, R. Phillips, L. Seeb, C. Smith, K. Warheit, S. Young, and J.C. Garza. 2008. Differentiating populations at broad and fine geographic scales with microsatellites and SNPs. Molecular Ecology 17: 3464-3477

Funk, V.A., R.W. Olsen, M. Raap, D. Smith, L. Aitken, J.D. Haddow, D. Wang, J.A. Dawson-Coates, R.D. Burke, and K.M. **Miller**. 2008. Identification, characterization, and deduced amino acid sequence of the dominant protease from *Kudoa paniformis* and *K. thyrsites*: A unique cytoplasmic cysteine protease. Comparative Biochemistry and Physiology, Part B 149: 477-489.

Funk, V, M Raap, K Sojonky, S Jones, J Robinson, C Falkenberg, and K **Miller**. 2007. Development and validation of an RNA- and DNA-based quantitative PCR assay for the quantitative detection of *Kudoa thyrsites* (Gilchrist) in Atlantic salmon (Salmo salar). Dis. Aquat. Org. 75: 239-49.

Dionne M, K.M. **Miller**, J.J. Dodson, F. Caron, L. Bernatchez. 2007. Clinal varaiation in MHC diversity with temperature: evidence for the role of host-pathogen interaction on local adaptation in Atlantic salmon. Evolution. 61: 2154-64.

Lukacs, M.F., H Harstad, U. Grimholt, M. Beetz-Sargent, G.A. Cooper, L. Reid, H.G. Bakke, R.B. Phillips, K.M. **Miller**, WS Davidson, BF Koop. 2007. Genomic organization of duplicated major histocompatibility complex class I regions in Atlantic salmon (*Salmo salar*). BMC Genomics 8: 251 (25 July 2007).

Miller, K.M., G. Traxler, K.H. Kaukinen, S. Li, J. Richard and N. Ginther. 2007. A cDNA microarray study of Atlantic salmon (*Salmo salar*) response to Infectious Hematopoietic Necrosis (IHN) virus. Aquaculture 272 (Supplement 1): S217-S237.

Rajakaruna, R.S., J.A. Brown, K.H. Kaukinen, and K.M. **Miller**. 2006. Major histocompatibility complex and kin discrimination in Atlantic salmon and Brook trout. Mol. Ecol. 15: 4569-4575.

Miller, K.M., S Li, T.J. Ming, K.H. Kaukinen, and AD Schulze. 2006. The salmonid MHC class I: more ancient loci uncovered. Immunogenetics 58: 571-589.

Miller, K.M., K.J. Supernault, S. Li and R.E. Withler. 2006. Population structure in two marine invertebrate species (*Panopea abrupta* and *Strongylocentrotus franciscanus*) targeted for aquaculture and enhancement in British Columbia. J. Shellfish Res 25: 33-42.

Schulze, A.D., A.O. Alabi, A. Sheldrake, and K.M. **Miller**. 2006. Bacterial diversity in a marine hatchery: balance between pathogenic and potentially probiotic bacterial strains. Aquaculture 256: 50-73.

Beacham, T. D., J. R. Candy, K. L. Jonsen, J. Supernault, M. Wetklo, L. Deng, K. M. **Miller**, and R. E. Withler. 2006. Estimation of stock composition and individual identification of Chinook salmon across the Pacific Rim using microsatellite variation. Transactions of the American Fisheries Society 135: 861-888.

Beacham, T. D., B. McIntosh, C. MacConnachie, K. M. **Miller**, R. E. Withler, and N. V. Varnavskaya. 2006. Pacific Rim population structure of sockeye salmon as determined from microsatellite analysis. Transactions of the American Fisheries Society 135: 174-187.

Beacham, T.D., J.R. Candy, B. McIntosh, C. MacConnachie, A. Tabata, K.M. **Miller**, and R.E. Withler. 2005. DNA-level variation of sockeye salmon (*Oncorhynchus nerka*) in southeast Alaska and the Nass and Skeena rivers, British Columbia, with applications to stock identification. N. Amer. J. Fish. Manage. 25(3): 763-776.

Withler, R.E., K.J. Supernault and K.M. **Miller**. 2005. Genetic variation within and among domesticated Atlantic salmon broodstocks in British Columbia, Canada. Animal Genetics 36: 43-50.

Beacham, T.D., M. Lapointe, J.R. Candy, B. McIntosh, C. MacConnachie, A. Tabata, K. Kaukinen, L. Deng, K.M. **Miller**, and R.E. Withler. 2004. Stock identification of Fraser River sockeye salmon (*Oncorhynchus nerka)* using microsatellites and major histocompatibility complex variation. Trans. Am. Fish. Soc. 133: 1106-1126.

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(*Oncorhynchus nerka)* using microsatellites and major histocompatibility complex variation. Trans. Am. Fish. Soc. 133: 1106-1126.

Miller, K.M., J.R. Winton, A. Schulze, M.K. Purcell, and T. Ming. 2004. Major Histocompatibility Complex loci are associated with susceptibility of Atlantic salmon to infectious hematopoietic necrosis virus. Env. Biol. Fish. 69: 307-316.

Kaukinen, K.H, K.J. **Supernault**, and K.M. **Miller**. 2004. Enrichment of Tetranucleotide Microsatellite Loci from Marine Invertebrate species. J. Shellfish Res 23(2): 621-626.

Kaukinen, K.H., K.J. Supernault, and K.M. **Miller**. 2004. Development of microsatellite loci in eulachon (Thaleichthys *pacificus*). Mol. Ecol. Notes 4: 632-634.

Beacham, T.D., M. Lapointe, J.R. Candy, K.M. **Miller**, and R.E. Withler. 2004. DNA in action: Rapid application of DNA variation to sockeye salmon fisheries management. Cons. Gen. in Press.

Miller, K.M., J.R. Winton, A. Schulze, M.K. Purcell, and T. Ming. 2004. Major Histocompatibility Complex loci are associated with susceptibility of Atlantic salmon to infectious hematopoietic necrosis virus. Env. Biol. Fish. 69: 307-316.

Withler, R.E., J.R. Candy, T.D. Beacham and K.M. **Miller**. 2004. Forensic DNA analysis of Pacific salmonid samples for species and stock identification. Env. Biol. Fish. 69: 275-285.

Withler, R.E., J.R. King, J.B. Marliave, B. Beaith, S. Li, K.J. Supernault, K.M. **Miller**. 2004. Polygamous mating and high levels of genetic variation in lingcod (*Ophiodon elongatus*) of the Strait of Georgia, British Columbia. Env. Biol. Fish. 69: 345-357.

Withler, RE, A Campbell, S Li, D Brouwer, KJ Supernault, and KM **Miller**. 2003. Implications of high levels of genetic diversity and weak population structure for the rebuilding of northern abalone in British Columbia, Canada. J Shellfish Res 22: 839-847.

Beacham, T.D., J.R. Candy, K.J. Supernault, M. Wetklo, B. Deagle, K. Labaree, J.R. Irvine, K.M. **Miller**, R.J. Nelson, and R.E. Withler. 2003. Evaluation and application of microsatellites for population identification of Fraser River chinook salmon (*Oncorhynchus tshawytscha*). Fishery Bulletin 101: 243-259.

Beacham, T.D., K.J. Supernault, M. Wetklo, B. Deagle, K. Labaree, J.R. Irvine, J.R. Candy, K.M. **Miller**, R.J. Nelson and R.E. Withler. 2003. The geographic basis for population structure in Fraser River chinook salmon, *Oncorhynchus tshawytscha.* Fishery Bulletin 101: 229-242.

Beacham, T.D., J. Brattey, K.D. Le, K.M. **Miller**, and R.E. Withler. 2002. Multiple stock structure of Atlantic cod (Gadus morhua) off Newfoundland and Labrador determined from genetic variation. ICES J. Mar. Sci. 59(4): 650-655.

Miller, KM, KH Kaukinen, and AD Schulze. 2002. Expansion and contraction of major histocompatibility complex (MHC) genes: a teleostean example. Immunogenetics 53: 941-963.

Miller, KM, KH Kaukinen, TD Beacham, and RE Withler. 2001 Geographic heterogeneity in natural selection on an MHC locus in sockeye salmon. Genetica 111: 237-257.

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Miller, KM, K Laberee, KH Kaukinen, S Li, and RE Withler. 2001. Development of microsatellite loci in pinto abalone (*Haliotis kamtschatkana*). Molecular Ecology Notes 1(4): 315-317.

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Withler, R.E., T.D. Beacham, A.D. Schulze, L.J. Richards, and K.M. **Miller**. 2001. Co-existing populations of Pacific Ocean perch, *Sebastes alutus*, in Queen Charlotte Sound, British Columbia. Mar. Biol. 139: 1-12.

Beacham, T.D., J.R. Candy, K.J. Supernault, T. Ming, B. Deagle, A. Schultz, D. Tuck, K. Kaukinen, J.R Irvine, K.M. **Miller**, and R. E. Withler. 2001. Evaluation and application of microsatellite and major histocompatibility complex variation for stock identification of coho salmon in British Columbia. Trans. Am. Fish. Soc. 130: 1116-1155.

Beacham, T.D., C.C. Wood, R.E. Withler, K.D. Le and K.M. **Miller**. 2000. Application of microsatellite DNA variation to estimation of stock composition and escapement of Skeena River sockeye salmon (*Oncorhynchus nerka*). N. Pac. Anadr. Fish Comm. Bull. No. 2: 263-276.

Miller, K.M., K.D. Le and T.D. Beacham. 2000. Development of tri- and tetranucleotide repeat microsatellite loci in Atlantic cod (*Gadus morhua*). Molecular Ecology 9(2): 238-240.

Miller, K.M., A.D. Schulze and R.E. Withler. 2000. Characterization of microsatellite loci in *Sebastes alutus* and their conservation in congeneric rockfish species. Molecular Ecology 12: 240-242.

Withler, R.E., K.D. Le, R.J. Nelson, K.M.**Miller**, and T.D. Beacham. 2000. Intact genetic structure and high levels of genetic diversity in bottlenecked sockeye salmon, *Oncorhynchus nerka*, populations of the Fraser River, British Columbia, Canada. Canadian Journal of Fisheries and Aquatic Sciences 57: 1985-1998.

Secondary Publications, Book Chapter, Conference Articles and technical reports

Miller, K.M. and N. Maclean. 2008. Teleost microarrays: development in a broad phylogenetic range reflecting diverse applications. J. Fish Biol. 72: 1-11.

Miller, K.M., K.H. Kaukinen, K. Laberee, and K.J. Supernault. 2004. Microsatellite loci from red sea urchins (*Strongylocentrotus franciscanus*). Mol. Ecol. Notes 4: 722-724.

Flajnik, M.F., K.M. **Miller** and L. Du Pasquier. 2003. Evolution of the immune system. In: Fundamental Immunology, Fifth Edition, Chapter 18. WE Paul (ed.), Lippincott-Raven Publishers, Philadelphia.

Miller, K.M., T.D. Beacham, R.E. Withler. 2002. Use of Neutral and Adaptive Genetic Variation in the Management and Conservation of Pacific Salmon. ICES CM 2002/U:17.

Yamanaka, K.L., R.E. Withler, and K.M. **Miller**. 2001. Structure of yelloweye rockfish (*Sebastes ruberrimus*) populations in British Columbia. Can. Stock Assess. Secret. Res. Doc. 2001/172.

Withler, R.E, A. Campbell, S. Li, K.M. **Miller**, D. Brouwer, and B. Lucas. 2001. High levels of genetic variation in northern abalone, *Haliotis kamtschatkana*, of British Columbia. Can. Stock Assess. Secret. Res. Doc. 2001/

Beacham, T.D., J.F. Schweigert, C. MacConnachie, K.D. Le, K. Labaree, and K.M. **Miller**. 2001. Population structure of herring *(Clupea pallasi*) in British Columbia: an analysis using microsatellite loci. Can. Stock Assess. Secret. Res. Doc. 2001/

Beacham, T.D., J.R. Candy, B. McIntosh, C. MacConnachie, A. Tabata, K. Kaukinen, K.M. **Miller**, and R.E. Withler. 2001. Estimation of stock composition of sockeye salmon in the North Pacific Ocean. NPAFC Doc. 552.

Beacham, T.D., J. Brattey, K.M. **Miller**, K.D. Le and R.E. Withler. 2000. Population structure of Atlantic cod (*Gadus morhua*) in the Newfoundland and Labrador area determined from genetic variation. Can. Stock Assess. Secret. Res. Doc. 2000/099. 26 p.

Beacham, T.D., C.C. Wook, R.E. Withler, K.K. Le, and K.M. **Miller**. 2001. Application of microsatellite DNA variation to estimation of stock composistion and escapement of Skkena River sockeye salmon (Oncorhynchus nerka). North Pacific Anadramous Fishries Communication Bulletin : In Press.

Miller, K.M., T.J. Ming, A.D. Schulze and R.E. Withler. 2000. Denaturing gradient gel electrophoresis (DGGE): A rapid and sensitive technique to screen nucleotide sequence variation in populations. In: Polymorphism Analysis and Detection Techniques. J. Burczak and E. Mardis (eds). BioTechniques Books, Natick, MA.

Miller, K.M., T.J. Ming, A.D. Schulze, K.H. Kauninen, K. Bucklin and M. Calavetta. 2000. Update to: Denaturing gradient gel electrophoresis (DGGE): A rapid and sensitive technique to screen nucleotide sequence variation in populations. pp. 269-270. In: Polymorphism Analysis and Detection Techniques. J. Burczak and E. Mardis (eds). BioTechniques Books, Natick, MA

Other Evidence of Impact:

- Member of NSERC Discovery Grant Committee GSC 18 for Ecology and Evolution from 2002-2005.
- Serving on the NSERC John C. Polanyi award Committee in 2007
- Guest Editor for Journal of Fish Biology special issue on microarrays (2007)
- Genetics subject editor for Marine and Coastal Fisheries Journal
- Editorial board of Immunogenetics (MHC editor)
- Regular manuscript reviews for Molecular Ecology, Immunogenetics, Proc. Roy. Soc. B J. Molecular Evolution, Genome, Marine Biotechnology, Animal Conservation, J. Aquatic Health, Genetica, Molecular Evolution, Environmental Biology of Fishes, Fish and Shellfish Immunology, Marine Biology, Developmental and Comparative Immunology, Aquaculture, J. Applied Aquaculture, J. Shellfish Research
- Member of the International Society of Developmental and Comparative Immunology
- Hosted visiting students and researchers from Sweden, the US and Canada
- External examiner on PhD Thesis in Sweden (2003)
- Invited seminars at Universities in the US, Canada and Sweden
- Collaborator on Genome Canada “Genomic Research on Atlantic Salmon Project” (GRASP) from 2003-2005
- Lead of a 5.3 million dollar Genome British Columbia Project “Genomic Tools for Fisheries Management (FishManOmics) 2008-2012
- Award for best Genetics paper in Transactions of the American Fisheries Society in 2001
- Extensive collaborations with academic (UBC, SFU, UVIC, Memorial, Laval, Oregon State University), government (DFO, NOAA-NMFS, ADFG, WDFW) and industry partners (aquaculture and wild fisheries).
- Funding from numerous agencies including within DFO: ACRDP, CFAR, Fraser River Public Review Board, SARA, Science Strategic Research, and outside DFO: Genome BC, Pacific Salmon Commission, Canadian Biotechnology Strategy, Canada-US Pacific Salmon Treaty Funding, Herring Conservation and Research Society, the BC Government, First Nations, Alaska Dept. of Fish and Game, and NOAA.