



ICISB 2019 Scientific Programme

Monday, 18 November

08:00 – 19:00	Registration Open
08:00 – 08:50	Morning Coffee and Exhibition Open
08:50 – 10:00	Welcome Session and Plenary Talks <i>Chair: Dr Dan Macqueen (The Roslin Institute, University of Edinburgh, UK)</i>
08:50 - 09:15	ICISB 2019 Welcome & Housekeeping
09:15 – 10:00 45 min slot	PLENARY-1: From GRASP to FAASG. A perspective on developments in salmonid genomics <i>Ben Koop, University of Victoria, Canada</i>
10:00 – 10:20	Refreshment break and Exhibition Open
10:20 – 13:00	Session 1: Genome resources and evolution of salmonids <i>Chair: Dr Anna Wargelius (Institute of Marine Research, Norway)</i>
10:20 – 10:45 25 min slot	KEYNOTE-1: Gene regulatory evolution following whole genome duplication <i>Simen Sandve, Norwegian University of Life Sciences, Norway</i>
10:45 – 11:05 20 min slot	INVITED-1.1: The extent and significance of lineage-specific rediploidization after autotetraploidization in salmonids <i>Manu Kumar Gundappa, Roslin Institute, Edinburgh, UK</i>
11:05 – 11:25 20 min slot	INVITED-1.2: Reconstructing the ancestral organisation of genomes to shed light on their evolution <i>Camille Berthelot, Institut de Biologie de l'Ecole Normale Supérieure, France</i>
15 min slot	ORAL-1.1: A <i>de novo</i> chromosome-level genome assembly of <i>Coregonus</i> sp. “balchen” – towards understanding adaptation and speciation in the Swiss Alpine whitefish radiation <i>Rishi De-Kayne, EAWAG Swiss Federal Institute of Aquatic Science and Technology, Switzerland</i>
15 min slot	ORAL-1.2: Pan-genomics to capture structural variation in Atlantic salmon <i>Michel Moser, Norwegian University of Life Sciences, Norway</i>
12 min slot	ORAL-1.3: The population genomic landscape of structural variation in Atlantic salmon <i>Alicia Bertolotti, University of Edinburgh, UK</i>
12 min slot	ORAL-1.4: A long reads-based De-novo assembly of the rainbow trout Arlee-line genome <i>Yniv Palti, USDA Agricultural Research Service, USA</i>
12 min slot	ORAL-1.5: Completing and improving genome assemblies for the Pacific salmon <i>Eric Rondeau, University of Victoria, Canada</i>

12 min slot	ORAL-1.6: Novel chromosomal polymorphisms in North American and hybrid families of Atlantic salmon (<i>Salmo salar</i>) identified using high-density linkage mapping of genotypes from a 50K single nucleotide polymorphism chip <i>Elizabeth Grace Boulding, University of Guelph, Canada</i>
12 min slot	ORAL-1.7: Genomic regions under selection in landlocked Atlantic salmon <i>Erik Kjærner-Semb, Institute of Marine Research, Bergen, Norway</i>
13:00 – 14:00	Lunch Break, Poster Viewing and Exhibition Open
14:00 – 17:00	Session 2: Functional genomics and annotation <i>Chair: Dr Rod Vidal (University of Santiago, Chile)</i>
14:00 – 14:25 25 min slot	KEYNOTE-2: Edition of the duplicated insulin-like growth factor binding protein-2b gene in rainbow trout (<i>Oncorhynchus mykiss</i>) and the compensatory response of the somatotrophic axis <i>Beth Cleveland, United States Department of Agriculture, USA</i>
14:25 – 14:45 20 min slot	INVITED-2.1: Highly efficient CRISPR/Cas9 knock-in in Atlantic Salmon <i>Rolf Edvardsen, Institute of Marine Research, Bergen, Norway</i>
14:45 – 15:05 20 min slot	INVITED-2.2: Temporal dynamics of DNA methylation patterns in response to hatchery-rearing in steelhead (<i>Oncorhynchus mykiss</i>) <i>Mackenzie Gavery, University of Washington, USA</i>
15:05 – 15:30	Refreshment Break and Exhibition Open
15:30 – 17:00	Session 2: Functional genomics and annotation (continuation) <i>Chair: Prof. Sigbjørn Lien (Norwegian University of Life Sciences, Norway)</i>
15 min slot	ORAL-2.1: Vgll3 alleles connects to the Brain Pituitary Testis axis in immature Atlantic salmon <i>Anna Wargelius, Institute of Marine Research, Norway</i>
15 min slot	ORAL-2.2: Regulatory divergence in vgll3 underlies variation in age at maturity in male Atlantic salmon <i>Jukka-Pekka Verta, University Of Helsinki, Finland</i>
12 min slot	ORAL-2.3: Beyond the transcriptome modulation during Atlantic salmon smoltification process: role of non-coding RNAs in seawater adaptation <i>Valentina Valenzuela-Muñoz, University of Concepción, Chile</i>
12 min slot	ORAL-2.4: Genomic approach to identify nonvisual photoreceptors in Atlantic salmon and effects of light environment on early development <i>Mariann Eilertsen, University of Bergen, Bergen, Norway</i>
12 min slot	ORAL-2.5: Identification and characterization of miRNAs and lncRNAs of coho salmon (<i>Oncorhynchus kisutch</i>) in normal immune organs. <i>Rodrigo Vidal, Universidad De Santiago, Santiago, Chile</i>
12 min slot	ORAL-2.6: Gene regulatory interactions during thermal stress and overstocking in rainbow trout aquaculture <i>Tom Goldammer, Institute for Genome Biology, Leibniz Institute for Farm Animal Biology (FBN), Dummerstorf, Germany</i>
	ORAL-2.7: Effects of freezing on chromatin accessibility in liver and brain of Atlantic salmon

12 min slot	<i>Matilde Mengkrog Holen, Norwegian University of Life Sciences, Norway</i>
17:00 – 17:30	Poster Viewing and Networking
17:45 – 19:00	Welcome Reception in the Playfair Hall
From 19:00	Departure for pre-booked Edinburgh Tours

Tuesday, 19 November

08:00 – 18:00	Registration Open
08:00 – 08:45	Morning Coffee and Exhibition Open
08:45 – 10:40	Session 3: Advances in precision breeding <i>Chair: Prof. Ross Houston (The Roslin Institute, University of Edinburgh, UK)</i>
08:45 – 09:10 25 min slot	KEYNOTE-3: Disruptions through Data Driven Breeding and integration will drive step changes in animal and crop performance <i>John Hickey, Roslin Institute, Edinburgh, UK</i>
09:10 – 09:30 20 min slot	INVITED-3.1: Advances in precision breeding <i>Anna Sonesson, Nofima, Norway</i>
09:30 – 09:50 20 min slot	INVITED-3.2: Leveraging genomic information for the genetic improvement of farmed salmon and trout <i>José Manuel Yáñez, University of Chile, Chile</i>
12 min slot	ORAL-3.1: Optimising low-cost genotyping and imputation strategies for genomic selection in Atlantic salmon breeding <i>Smaragda Tsairidou, University of Edinburgh, UK</i>
12 min slot	ORAL-3.2: VIRGIN SALMON - a sustainable solution for coexistence of farmed and wild salmon strains without mixing <i>Hilal Güralp, Institute of Marine Research, Bergen, Norway</i>
12 min slot	ORAL-3.3: Detection of selection signatures in the genome of Rainbow trout (<i>Oncorhynchus mykiss</i>) <i>Maria Cádiz, Universidad of Chile, Chile</i>
12 min slot	ORAL-3.4: Genome-wide association study of piscine myocarditis virus (PMCV) resistance in Atlantic salmon (<i>Salmo salar</i>). <i>Borghild Hillestad, Benchmark Genetics Norway As, Norway</i>
10:40 – 11:20	Refreshment break and Exhibition Open

11:20 – 17:00	Session 4: Environment, ecology and conservation <i>Chair: Prof. Ben Koop (University of Victoria, Canada)</i>
11:20 – 11:45 25 min slot	KEYNOTE-4: Sex-dependent dominance maintains migration supergene in rainbow trout <i>Nicky Barson, Norwegian University of Life Sciences, Norway</i>
11:45 – 12:05 20 min slot	INVITED-4.1: Convergence in form and function overcomes non-parallel evolutionary histories in Arctic charr <i>Kathryn Elmer, University of Glasgow, UK</i>
12:05 – 12:25 20 min slot	INVITED-4.2: Recolonization following dam removal: observations on genetic and life history variation in <i>Oncorhynchus mykiss</i> in the Elwha River, Washington, USA <i>Krista Nichols, National Oceanic and Atmospheric Administration, USA</i>
12:25 – 12:45 20 min slot	INVITED-4.3: Repeated signatures of local selection across salmonid populations <i>Victoria Pritchard, University of Turku, Finland</i>
12:45 – 13:05 20 min slot	INVITED-4.4: Geographic variation in host resistance to an indigenous pathogen, Infectious Hematopoietic Necrosis Virus; the role of loci of large effect <i>Kerry Naish, University of Washington, USA</i>
13:05 – 14:00	Lunch Break, Poster Viewing and Exhibition Open
14:00 – 15:20	Session 4: Environment, ecology and conservation (continuation) <i>Chair: Prof. Kerry Naish (University of Washington, USA)</i>
15 min slot	ORAL-4.1: The genetic basis of age at maturity in Atlantic salmon: from GWAS to function, ecology, and conservation <i>Craig Primmer, University of Helsinki, Finland</i>
15 min slot	ORAL-4.2: A chromosomal rearrangement correlates with variation in age of seaward migration in Atlantic salmon <i>Sarah Lehnert, Fisheries and Oceans, Canada</i>
10 min slot	ORAL-4.3: Temporal persistence of epigenomic reprogramming induced by hatchery rearing <i>Maeva Leitwein, University Laval, Québec, Canada</i>
	ORAL-4.4: withdrawn
10 min slot	ORAL-4.5: Environmentally associated chromosomal translocation influences fine-scale population structure of Atlantic salmon <i>Beth Watson, Dalhousie University, Halifax, Canada</i>
10 min slot	ORAL-4.6: Y-chromosome haplotypes are associated with variation in size and age at maturity in male Chinook salmon <i>Garrett McKinney, NOAA National Marine Fisheries Service, Seattle, USA</i>
10 min slot	ORAL-4.7: Rapid niche expansion in European whitefish by selection on functional genomic variation after ecosystem recovery <i>Arne Jacobs, Cornell University, New York, USA</i>

15:20 – 16:00	Refreshment Break and Exhibition Open
16:00 – 16:50	Session 4: Environment, ecology and conservation (continuation) <i>Chair: Dr Krista Nichols (US National Oceanic and Atmospheric Administration, USA)</i>
10 min slot	ORAL-4.8: Investigation of sexually antagonistic loci in the facultatively anadromous brown trout, <i>Salmo trutta</i> <i>Joe Colgan, University College Cork, Ireland</i>
10 min slot	ORAL-4.9: Assessing genomic vulnerability to climate change in Canada's northernmost freshwater fish, Arctic charr <i>Kara Layton, Memorial University Of Newfoundland, Canada</i>
10 min slot	ORAL-4.10: Demographic history, linked selection, and recombination shape the genomic landscape of a broadly distributed Pacific salmon. <i>Quentin Rougemont, University Laval, Quebec, Canada</i>
10 min slot	ORAL-4.11: Evolution as playing musical chairs: investigating genomic and phenotypic divergence among sympatric Arctic charr morphs in the Lake Thingvallavatn-Ulfjotsvatn system <i>Han Xiao, University of Iceland, Iceland</i>
10 min slot	ORAL-4.12: Beyond large-effect loci: large-scale GWAS reveals mixed large-effect and polygenic architecture of Atlantic salmon age-at-maturity <i>Marion Sinclair-Waters, University of Helsinki, Finland</i>
17:00 – 18:00	Poster Viewing and Networking

Wednesday, 20 November

08:00 – 18:00	Registration Open
08:00 – 08:45	Morning Coffee and Exhibition Open
08:45 – 11:00	Session 5: Industrial perspectives <i>Chair: Dr Ashie Norris (Mowi Genetics)</i>
08:45 – 09:10 25 min slot	KEYNOTE-5: An overview of the Scottish salmon farming sector: past, present and future <i>Iain Berrill, Scottish Salmon Producers Organisation, Scotland</i>
09:10 – 09:30 20 min slot	INVITED-5.1: Genomics in selective breeding of salmonids: Prospects and limitations <i>Jørgen Ødegård, AquaGen, Norway</i>
09:30 – 09:50 20 min slot	INVITED-5.2: Innovations for enhanced performances and environmentally friendly salmon farming <i>Herve Migaud, University of Stirling, Scotland</i>
09:50 – 10:10 20 min slot	INVITED-5.3: Genomic technologies: one of the many pieces of the aquaculture machine <i>Serap Gonen, MOWI Breeding, Ireland</i>
	ORAL-5.1: Withdrawn
12 min slot	ORAL-5.2: Growth and welfare of germ cell-free Atlantic salmon



12 min slot	<p><i>Lene Kleppe, Institute of Marine Research, Norway</i></p> <p>ORAL-5.3: Iron chelator deferoxamine decreases the infection of Atlantic salmon SHK-1 cells with bacterium <i>Piscirickettsia salmonis</i></p> <p><i>Rodrigo Díaz, Cargill Innovation Centre, Puerto Montt, Chile</i></p>
12 min slot	<p>ORAL-5.4: Genetic Resistance to Bacterial Kidney Disease –BKD: Application of Genomic Selection in Atlantic Salmon Breeding Program</p> <p><i>Jean Paul Lhorente, Benchmark Genetics Chile, Chile</i></p>
11:00 – 11:30	Refreshment break and Exhibition Open
11:30 – 13:15	<p>Session 6: Physiology and Nutrition</p> <p><i>Chair: Prof. Sam Martin (University of Aberdeen, UK)</i></p>
11:30 – 11:55 25 min slot	<p>KEYNOTE-6: Salmonids in warming world; cardiovascular capacity to respond climate change</p> <p><i>Katja Anttila, University of Turku, Finland</i></p>
11:55– 12:15 20 min slot	<p>INVITED-6.1: Sdy, the unusual rainbow trout sex determination gene, hijacked the canonical vertebrate gonadal differentiation pathway</p> <p><i>Yann Guiguen, French National Institute of Agricultural Research, France</i></p>
12 min slot	<p>ORAL-6.1: Effects of low oxygen stress on DNA-methylation and gene expression during the early development of Atlantic salmon</p> <p><i>Erica Leder, Nofima, Tromsø/Ås, Norway</i></p>
12 min slot	<p>ORAL-6.2: Investigations of microbiomes in farmed salmonids</p> <p><i>Barbara Nowak, University Of Tasmania, Australia</i></p>
12 min slot	<p>ORAL-6.3: Testicular gene expression during the initiation of salmon puberty: Maturational changes and specific modulations reflecting the energetic status</p> <p><i>Rüdiger Schulz, Utrecht University, Netherlands</i></p>
12 min slot	<p>ORAL-6.4: A Systemic change of Fatty Acid Metabolism Regulation in Atlantic Salmon (<i>Salmo salar</i>) after CRISPR/Cas9-mediated Knockout of <i>elovl2</i>, $\Delta 5$-fads and $\Delta 6$-fads Genes</p> <p><i>Yang Jin, Norwegian University Of Life Sciences, Norway</i></p>
12 min slot	<p>ORAL-6.5: Loss-of-function of the <i>fsH</i> receptor shortens the maturation cycle in male Atlantic salmon</p> <p><i>Eva Andersson, Institute of Marine Research, Norway</i></p>
13:15 – 14:15	Lunch Break, Poster Viewing and Exhibition Open
14:15 – 17:00	<p>Session 7: Immunology, disease and host-pathogen interactions</p> <p><i>Chair: Prof. Barbara Nowak (University of Tasmania, Australia)</i></p>
14:15 – 14:40 25 min slot	<p>KEYNOTE-7: Expansion of genes involved in antiviral defence in salmonids</p> <p><i>Chris Secombes, University of Aberdeen, Scotland</i></p>
14:40– 15:00 20 min slot	<p>INVITED-7.1: Characterization of the host-parasite interactome in the salmon-louse relationship</p> <p><i>Laura Marie Braden, AquaBounty, Canada</i></p>

15:00 – 15:20 20 min slot	INVITED-7.2: The dark matter of the salmon genome: non-coding RNAs as key players in the host-parasite interactions <i>Cristian Gallardo-Escarate, Concepcion, Chile</i>
15:20 – 15:40 20 min slot	INVITED-7.3: Determining the effects of selection and variation within populations to understand disease resistance in salmonid species. <i>Victor Martinez, University of Chile, Chile</i>
15:40 - 16:00	Refreshment Break and Exhibition Open
16:00 – 17:00	Session 7: Immunology, disease and host-pathogen interactions (continuation) <i>Chair: Prof. Kerry Naish (University of Washington, USA)</i>
15 min slot	ORAL-7.1: Differential Contributions of Fish Thermoregulation to the Promotion of Cellular Antimicrobial Defenses <i>Daniel Barreda, University of Alberta, Canada</i>
15 min slot	ORAL-7.2: Development of an <i>in vitro</i> genome editing platform for fish cells <i>Bertrand Collet, Institut National de la Recherche Agronomique (INRA), Université Paris-Saclay, France</i>
10 min slot	ORAL-7.3: Environmental influence on the Atlantic salmon epigenome during sea lice infestation <i>Shelly Trigg, School of Aquatic and Fishery Sciences, University Of Washington, US</i>
10 min slot	ORAL-7.4: Environmental Conditions Modulate the Non-Coding Transcriptome Responses in Atlantic Salmon Against Sea Lice Infection: Novel Key Molecular Regulators? <i>Gustavo Núñez-Acuña,, Universidad de Concepción, Concepción, Chile.</i>
10 min slot	ORAL-7.5: Salmon intestinal nutrimiromics: probiotic yeast regulates the interplay of miRNome, metagenome and transcriptome in the gut increasing homeostasis and health under stress <i>Ana Teresa Gonçalves, Universidad de Concepcion, Chile</i>
17:00 – 17:20	Closing words and thanks <i>Including awarding of prizes for eligible presentations</i>
From 19:00	Conference Dinner at The Hub

Poster Programme

Number	Title	Presenting Author
Poster-1	A long reads-based trio-binning De-novo assembly of the North American Atlantic salmon genome	Guangtu Gao
Poster-2	SalmoBase 2.0: An Integrative Genomic Data Resource for Salmonids.	Torfinn Nome
Poster-3	MinION (Nanopore Oxford) a pocket size sequencing platform for fish health screening	Ahmed Siah
Poster-4	Tracing genetic introgression of farmed salmon in wild populations: past achievements and future prospects	Ingerid Hagen Arnesen
Poster-5	Sympatric anadromous and resident Arctic char (<i>Salvelinus alpinus</i>) in Labrador, Canada demonstrate largely nonparallel genetic differentiation except for a few key genes	Sarah Salisbury
Poster-6	Understanding the genetics of run-timing of endangered Summer Puntledge River Chinook salmon	Kris Christensen
Poster-7	Genomic architecture of extreme deep-water adaptation in sympatric Arctic charr (<i>Salvelinus alpinus</i>)	Tony Kess
Poster-8	Small streams – critical reservoirs of genetic diversity for brown trout in the face of increasing anthropogenic stressors	Jamie Stevens
Poster-9	Genomic Targets of Selection in Diverging Arctic Charr (<i>Salvelinus alpinus</i>) Ecomorphs	Kevin Schneider
Poster-10	The sex ratio of sea trout (<i>Salmo trutta</i> L.) smolts and adults from the River Tamar, southwest England	Andrew King
Poster-11	Monitoring salmonid populations using unmanned aerial vehicles: a case study of Arctic charr in Iceland	Kalina Kapralova
Poster-12	Exploring the genetic and phenotypic diversity of Icelandic brown trout: implications for the conservation of natural populations.	Marcos Lagunas
Poster-13	Pituitary gonadotropin gene expression during the onset of postsmolt maturation in male Atlantic salmon: developmental changes and tissue culture studies	Diego Crespo
Poster-14	GENOMICS FOR THE UNDERSTANDING OF THE HOST-PATHOGEN INTERACTION: THE CASE OF THE ATLANTIC SALMON AND PISCIRICKETTSIA SALMONIS	Diego Valenzuela-Miranda
Poster-15	LONG-TERM, PROTEOME-SCALE ANALYSIS OF RAINBOW TROUT IMMUNE PROTEINS: IMPLICATIONS FOR AQUACULTURE VACCINE DEVELOPMENT	Fiona Bakke
Poster-16	Skin health of chinook salmon farmed in New Zealand	Barbara Nowak
Poster-17	Drivers of Sex Chromosome Evolution in Atlantic Salmon	Live Rud-johansen
Poster-18	Improving the functional annotation of the rainbow trout genome	Yniv Palti
Poster-19	Liver slice culture as a model for lipid metabolism in fish	Thomas Harvey
Poster-20	Genetic diversity, population structure, and evolutionary implications of translocation for whitefish in Scotland	Marco Crotti
Poster-21	Development of a Bicistronic Vector for the Expression of a CRISPR/Cas9-mCherry System in Fish Cell Lines	Sebastian Escobar-Aguirre
Poster-22	RNAseq profiling of <i>Salmo trutta</i> to investigate differential gene expression of alternate migratory life histories.	Robert Wynne
Poster-23	Highly efficient CRISPR/Cas9-mediated HDR in Atlantic salmon shows that ODN concentration and polarity matters	Anne Hege Straume



Poster-24	The genomic basis of anadromy in brown trout	Peter Moran
Poster-25	Within-river genetic population structure in a large Baltic salmon population	Antti Miettinen
Poster-26	Comparative Annotation of Salmonid Transposable Elements	Øystein Monsen
Poster-27	Identification of functional genes related to host resistance to <i>Piscirickettsia salmonis</i> in Atlantic salmon (<i>Salmo salar</i>) using RNA-Seq	Carolina Moraleda
Poster-28	Significant Synteny and Colocalization of Ecologically Relevant Quantitative Trait Loci Within and Across Species of Salmonid Fishes	Mel Chen
Poster-29	The Olympic Mudminnow genome as a complementary outgroup for Salmonids	Michel Moser
Poster-30	R interface to salmonid genomic data resources	Gareth Gillard
Poster-31	Clock genes and circadian rhythmicity in Atlantic salmon	Charlotte Bolton
Poster-32	Dealing with population stratification in marker-assisted selection: use of subpopulation-specific tag-haplotypes	Thomas Moen
Poster-33	Annotation and evolution of salmonid microRNAs	Richard Taylor
Poster-34	Functional studies of mucosal gill health in Atlantic salmon (<i>Salmo salar</i>)	Eoin Costelloe