

**Program for special session on *Host resistance to sea lice* at AQUA2024 Copenhagen
Wednesday 28th August 2024**

Session chair – Nick Robinson Nofima,

Co-chairs - Ross Houston, Benchmark Genetics and Diego Robledo, The Roslin Institute

The infestation and removal of sea lice is an intractable problem affecting Atlantic salmon welfare and aquaculture. No existing lice control measures are completely effective. However, genetic variation in host resistance to sea lice exists both within populations of Atlantic salmon and between different species of salmonids, with some species, such as coho, able to mount an effective immune response. This special session will draw together the latest results of research from major projects investigating the genetic basis for host resistance to sea lice. How this knowledge might be used to prevent sea lice infestation in Atlantic salmon, and the implications for epidemiology of the lice and disease prevalence along the coast, will be discussed.

Introduction

9.00 – 9.15 Nick Robinson– Introduction and summary of ongoing research on host resistance to sea lice

9.15 – 9.30 Mark Fast – General overview on genetic mechanisms for sea lice resistance in salmon species

Results from ongoing research

9.30 – 9.45 Aleksei Krasnov – Chemical communication between the host and salmon louse

9.45 – 10.00 Mike McGowan – Lice transcriptomic response to potential semiochemicals

10.00 – 10.15 Gareth Gillard*, Tomasz Podgorniak*, Jacob Torgersen, Nicola Barson, Mark Fast, Matthew Kent and Sigbjørn Lien -_Comparative genomics to explore differential responses to sea lice in Atlantic salmon and coho

10.15 – 10.30 Sarah Salisbury – Gene response of different cell types in the skin to sea lice infection in four salmon species

10.30 – 10.45 Mari Austad Brandt, Jacob Torgersen and Guro Sandvik - *In vitro* approaches to decode sea lice resistance mechanisms

10.45 – 11.15 coffee break

11.15 – 10.30 Lene Sveen – Insights into lice resistance as evidenced by histology and spatial transcriptomics

11.30 – 10.45 Aina-Catherine Øvergård and Helena Marie Doherty Midtbø – Sea lice suppression of immune response

11.45 -12.00 Luqman Aslam and Clemence Fraslin – Mapping genes for host resistance to sea lice

12.00 -12.15 Nick Robinson – Prioritising genes to test further using CRISPR gene editing

12.15 -12.30 Teshome Bizuayehu – Knockout and knockin of genes to test their role in host resistance

12.30-14.00 Lunch

14.00 - 14.15 Tone-Kari Knutsdatter Østbye and Mette Wesmajervi Breiland – Challenging CRISPR gene edited fish with sea lice, results so far

14.15 – 14.30 Binyam Sime Dagnachew and Marie Lillehammer – Strategies for implementing gene-edited assisted selection to improve lice resistance

14.30 – 14.45 Andrew Coates – How might the lice evolve to overcome host resistance and how could we suppress adaptation by the lice?

14.45 -15.30 Open panel discussion- Ways forward using knowledge generated

Breeding, feeding, repellents, attractants and CRISPR gene editing (45 minutes)