Day 1
Wednesday – September 11

08:30  Registration

09:30  OPENING
Carlo C. Lazado
Scientific Chairman, MHA2019

09:45  NOFIMA AND ITS ROLE IN MUCOSAL HEALTH RESEARCH IN AQUACULTURE
Gunn Berit Olsson
Director of Research – Fish Health
Nofima

Session 1: Mucosal structures and functions
Session Chair: Monica F. Brinchmann, Nord University

10:00  Plenary talk
UTILIZING ‘OMICs TECHNOLOGIES AND HOST-PATHOGEN MODELS TO ELUCIDATE TELEOST MUCOSAL STRUCTURES AND FUNCTIONS

Prof. Eric Peatman, Auburn University

10:45  Coffee break

11:15  QUANTIFIED MUCOSAL HEALTH OF FISHES: THE PROPOSED “RULES”
Pittman, K., Okubamichael, M., Merkin, G., Haddeland, S., Lazado, C.C., Jonassen, T., Øyen, S., Sørensen, M., Korsnes, K., Powell, M., Sissener, N., Andersen, L., Bogevik, A., Dang, M., Nowak, B., Kousoulaki, K., Lyngøy, A., Myre, O.J.
11:30

**IN SITU STUDIES OF THE FUNCTIONAL BARRIER PROPERTIES OF THE SKIN MUCUS OF YOLK-SAC SALMON FRY (Salmo salar L.)**

Nordgård, C. T., Gómez de la Torre Canny, S., Dunker, K., Lyseid, R.S., Sletmoen, M., Bakke, I.

11:45

**FUNCTIONAL CHARACTERIZATION OF THE SKIN BARRIER OF RAINBOW TROUT AND HEALING OF A SUPERFICIAL WOUND**

Sundh, H., Sundell, K.

12:00

**RAINBOW TROUT PREFERENTIALLY RESPOND TO THYMUS-INDEPENDENT ANTIGENS UPON ANAL ADMINISTRATION**

Martín-Martín, A., Díaz-Rosales, P., Abós, B., Simón, R., Tafalla, C.

12:15

**EFFECTS OF STARVATION ON THE HUMORAL DEFENCE AND SKIN CICATRIZATION ON WOUNDED GILTHEAD SEABREAM**

Albaladejo-Riad, N., Esteban, M.A.

12:30

**A NOVEL METHOD BASED ON IMAGE ANALYSES FOR MEASURING SKIN MELANIZATION OF ATLANTIC SALMON**

Jiménez-Guerrero, R., Larsson, T., Sigholt, T., Mørkøre, T.

12:45 – 14:00  Lunch

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**Session 2: Mucosal health and nutrition**

Session Chair: Ma. Angeles Esteban, University of Murcia

14:00

Plenary talk

**OPTIMAL MUCOSAL FUNCTION REQUIRES OPTIMAL NUTRITION AND FEEDING**

Prof. Åshild Krogdahl, Norwegian University of Life Sciences

14:45

*MHA2019 Student Travel Award Recipient*

**EVALUATING THE POTENTIAL OF DIETARY LOW MOLECULAR SODIUM ALGINATE AND Pediococcus acidilactici ON HUMORAL AND MUCOSAL IMMUNE RESPONSES, INTESTINAL HISTOMORPHOLOGY AND LYSOZYME GENE EXPRESSION IN ASIAN SEA BASS (Lates calcarifer) JUVENILES**

Ashouri, G., Mahboobi S., N., Hoseinifar, S.H., Doan, V.H., Mozanzadeh, T., Carnevali, O.

15:00

**THE REARING ENVIRONMENT MASKS THE EFFECT OF DIETARY TREATMENT FOR SALMON LICE RESISTANCE**

FUNCTIONAL DIETS FOR GREATER AMBERJACK (*Seriola dumerili*) JUVENILES: MANNAN OLIGOSACCHARIDES AS REINFORCEMENT OF SKIN IMMUNE RESPONSE AND RESISTANCE TO PARASITATION WITH *Neobenedenia girellae* AND PHYTOBIOTICS TO IMPROVE WELFARE

Fernández-Montero, A., Torrecillas, S., Roo, J., Docando, J., Acosta, F., Bravo, J., Kalinowski, T., Makol, A., Sweetman, J., Montero, D.

Coffee break

16:00

SOYBEAN MEAL AND SEAWATER ENVIRONMENT AFFECT MUCOSAL IMMUNITY IN FISH

Djordjevic, B., Tomás-Almenar, C., Øverland, M. and Lagos, L.

16:15

DIETARY ADMINISTRATION OF *Shewanella putrefaciens* SpPdp11 FACILITATES THE SKIN MUCOSAL BARRIER REGENERATION OF EXPERIMENTALLY WOUNDED GILTHEAD SEABREAM (*Sparus aurata* L.)

Zhichu, C., Ceballos-Francisco, D., Guardiola, F.A., Esteban, M.A.

16:30

DIETARY PREBIOTICS AND PHYTOGENICS IN LOW FISH MEAL AND FISH OIL BASED DIETS FOR EUROPEAN SEABASS *Dicentrarchus labrax*: AN EFFECTIVE TOOL TO BOOST MUCOSAL TISSUES HEALTH AND DISEASE RESISTANCE


16:45

EFFECTS OF GRADED DIETARY LEVELS OF ESSENTIAL OMEGA-3 FATTY ACIDS ON BARRIER TISSUES INTEGRITY AND COMPOSITION OF MEMBRANE LIPIDS OF POST-SMOLT ATLANTIC SALMON

Bou M., Thomassen, M.S., Rud, I., Baeverfjord, G., Berge, G.M., Østbye, T-K., Ruyter, B.

17:00

SEA BASS GALT AND MICROBIOTA MODULATION IN RESPONSE TO FISH MEAL REPLACEMENT BY MICROALGAE


Poster Session and Networking

Tapas and drinks will be served
### Day 2

**Thursday – September 12**

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| 09:30 | Invited talk  
**MUCOSAL HEALTH FROM THE PERSPECTIVE OF A RESEARCH FUNDING AGENCY**  
Sven Martin Jørgensen  
Director R&D Fish Health  
The Norwegian Seafood Research Fund |
| 09:45 | **Continuation of**  
**Session 1: Mucosal structures and functions**  
**Session Chair: Monica F. Brinchmann, Nord University** |
| 09:45 | GILL MUCIN O-GLYCOSYLATION IN HEALTHY AND AMOEbic GILL DISEASE AFFECTED ATLANTIC SALMON  
| 10:00 | ORAL STIMULATION OF RAINBOW TROUT WITH *Aeromonas salmonicida* AND CHARACTERIZATION OF THE ADAPTIVE IMMUNE RESPONSE ASSEMBLED: FIRST STEPS TO AN ORAL VACCINATION MODEL  
**Montero R.**, Munkler L., Ostermann S, Köllner B |
| 10:15 | MECHANICAL MODELS OF WOUND HEALING PROCESSES IN FISH–PROS AND CONS OF WOUND PREPARATION AND DOWNSTREAM ANALYSIS  
**Sveen, L. R.**, Karlsen, K., Ytteborg, E.Y. |
| 10:30 | EVIDENCE OF IgD-SECRETING PLASMABLASTS WITH SPECIFIC MOLECULAR SIGNATURES IN THE INTESTINE OF TELEOST FISH  
Perdiguero, P., Martín-Martín, A., Benedicenti, O., Díaz-Rosales, P., Morel, E., Muñoz-Atienza, E., García-Flores, M., Simón, R., Soleto, I., Cerutti, A., **Tafalla, C.** |
| 10:45-11:15 | Coffee break |
| 11:15 | IMMUNITY IN THE SEA BASS (*Dicentrarchus labrax* L.) DIGESTIVE TRACT  
**Picchietti, S.**, Buonocore, F., Fausto, A.M., Scapigliati G. |
| 11:30 | CIRCADIAN RHYTHMS AND IMMUNITY – AN OVERLOOKED RELATIONSHIP IN FISH IMMUNOLOGY  
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<td><strong>HOST-MICROBIOME INTERACTIONS IN CHRONIC INFLAMMATORY CONDITIONS: LESSONS FROM HUMAN DISEASES</strong></td>
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<td>Dr. Johannes Hov, Oslo University Hospital</td>
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<td>12:30</td>
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<td><strong>INVESTIGATING THE ROLE OF MUCOSAL MICROBIOMES IN YELLOWTAIL KINGFISH EXHIBITING DIFFERENT HEALTH STATUS USING A MULTI-OMICS APPROACH</strong></td>
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<td>Lunch</td>
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<td>The Ministry of Trade and Industry</td>
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<td>14:15</td>
<td><strong>DEVELOPING NEXT GENERATION TOOLS TO SECURE A FUNCTIONAL GUT ENVIRONMENT THROUGH FEED DEVELOPMENT: THE GUTBIOM PROJECT</strong></td>
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<td>Kortner, T.M., Jaramillo-Torres, A., Forberg, T., Chikwati, E., Kousha, A., Mohammed, A.A., Li, Y., Krogdahl, Å.</td>
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<td>14:30</td>
<td><strong>MUCOSAL MICROBIOME OF LUMPFISH (Cyclopterus lumpus)</strong></td>
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<td>Jacobsen, Á., Patursson, E., Østerø, S.L., Jacobsen, E.</td>
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<td><strong>A NOVEL GNOTOBIOTIC HUSBANDRY SYSTEM FOR THE STUDY OF HOST-MICROBE INTERACTIONS IN ATLANTIC SALMON YOLK-SAC FRY (Salmo salar L.)</strong></td>
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<td>15:00</td>
<td><strong>CONFounding FACTORS AFFECTING ATLANTIC SALMON MICROBIOME STUDIES: ISSUES AND SUGGESTED RECOMMENDATIONS</strong></td>
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15:45  MHA2019 Student Travel Award Recipient
CHARACTERISING THE ROLE OF BACTERIAL GILL FLORA ON AMOEbic GILL DISEASE (AGD) PATHOGENICITY
Slinger, J., Wynne, J., Adams, M.

16:00  BACTERIAL COLONIZATION OF ATLANTIC SALMON (Salmo salar)
YOLK SAC FRY

16:15  FULL-LENGTH 16S rRNA GENE CLASSIFICATION OF ATLANTIC SALMON BACTERIA AND EFFECTS OF USING DIFFERENT 16S VARIABLE REGIONS ON COMMUNITY STRUCTURE ANALYSIS
Klemetsen, T., Willassen, N.P., Karlsen, C.R.

18:00-22:00  Conference dinner
Lavvo – Oslo Winter Park

Day 3
Friday – September 13
Session 4: Mucosal health and the changing environment
Session Chair: Sam Martin, University of Aberdeen

09:30  Plenary talk  
FISH HEALTH AND WELFARE IN NOVEL AQUACULTURE ENVIRONMENTS - THE IMPORTANCE OF PRIMARY BARRIERS
Prof. Kristina Sundell, University of Gothenburg

10:15  STRESS INDUCED ATLANTIC SALMON SKIN MUCIN O-Glycan CHANGES
Benktander, J., Sundh, H., Venkatakrishnan, V., Sundell, K., Padra, J.T., Murugan, A.V.M., Lindén S.K.

10:30  ATLANTIC SALMON SKIN FUNCTION AND DEVELOPMENT IN THE POST-SMOLT STAGE AFTER SEAWATER TRANSFER
Karlsen, C.R., Ytteborg, E., Sveen, L., Timmerhaus, G., Småge S.B., Krasnov, A.

10:45-11:15  Coffee break

11:15  FISH MUCUS COLLECTION STRATEGIES FOR METABOLOMICS: A DISTINCT RESPONSE TO AQUI-S AND BENZOCAINE ANAESTHETICS
Ivanova, L., Rangel-Huerta, O.D., Tartor, H., Gjessing, M.C., Dahle, M.K., Thoen, E., Uhlig, S.

11:30

*MHA2019 Student Travel Award Recipient*

MUSCLE AND MUCOSAL HEALTH IN FISH REARED UNDER HIGH WATER VELOCITIES – SHOULD WE COMPROMISE?

**Cabillon, N.A.**, Timmerhaus, G., Lazado, C.C., Reiten, B.K., Johansen, L.H.

11:45

VOLATILE ORGANIC COMPOUNDS IN THE MUCUS OF SEA LICE INFECTED SALMON

**Haugen, J.E.**, Difford, G., Johansen, L.H., Breiland, M.W., Jacq, C., Baranski, M., Boison, S., Moghadam, H., Hillestad, B., Leder, E.

12:00-13:15  Lunch

13:15

ADAPTIVE MUCOSAL RESPONSE IN THE GILLS OF ATLANTIC SALMON (*Salmo salar*) AFTER REPEATED EXPOSURE TO PERACETIC ACID IN SEAWATER-RAS

**Haddeland, S.**, Pittman, K., Merkin, G., Myhre, O.J., Okubamichael, M., Lazado, C.C., Pedersen, L.F.

13:30

TRANSCRIPTOME RESPONSES IN SKIN OF ATLANTIC SALMON FOLLOWING TWO DIFFERENT LEVELS OF INFECTION OF SEA LICE (*Caligus rogercresseyi*)

**Zindrili, R.**, Król, E., Mente, E., Douglas, A., Martin, S.A.M.

13:45

FOURIER TRANSFORM INFRARED SPECTROSCOPY AS A PROMISING TOOL FOR CHARACTERIZATION OF SALMON SKIN MUCUS

**Böcker, U.**, Sveen, L., Karlsen, C.R., Ytteborg, E.

14:00-14:15  Coffee break

14:15

THE ATLANTIC SALMON GILL TRANSCRIPTOME RESPONSE TO A NATURAL OUTBREAK OF SALMON GILL POX VIRUS INFECTION INDICATES SUPPRESSION OF MUCOSAL DEFENSE


14:30

MOLECULAR SIGNATURES OF ATLANTIC SALMON MUCOSA UNDER CHEMICALLY INDUCED OXIDATIVE STRESS


14:45

TBD

**Elisabeth Ytteborg**
15:00
Launch of the Mucosal Health in Aquaculture Platform
Awarding of Best Abstract, Best Poster, Best Oral Presentation
Closing

Organising institution:

Nofima

With support from

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