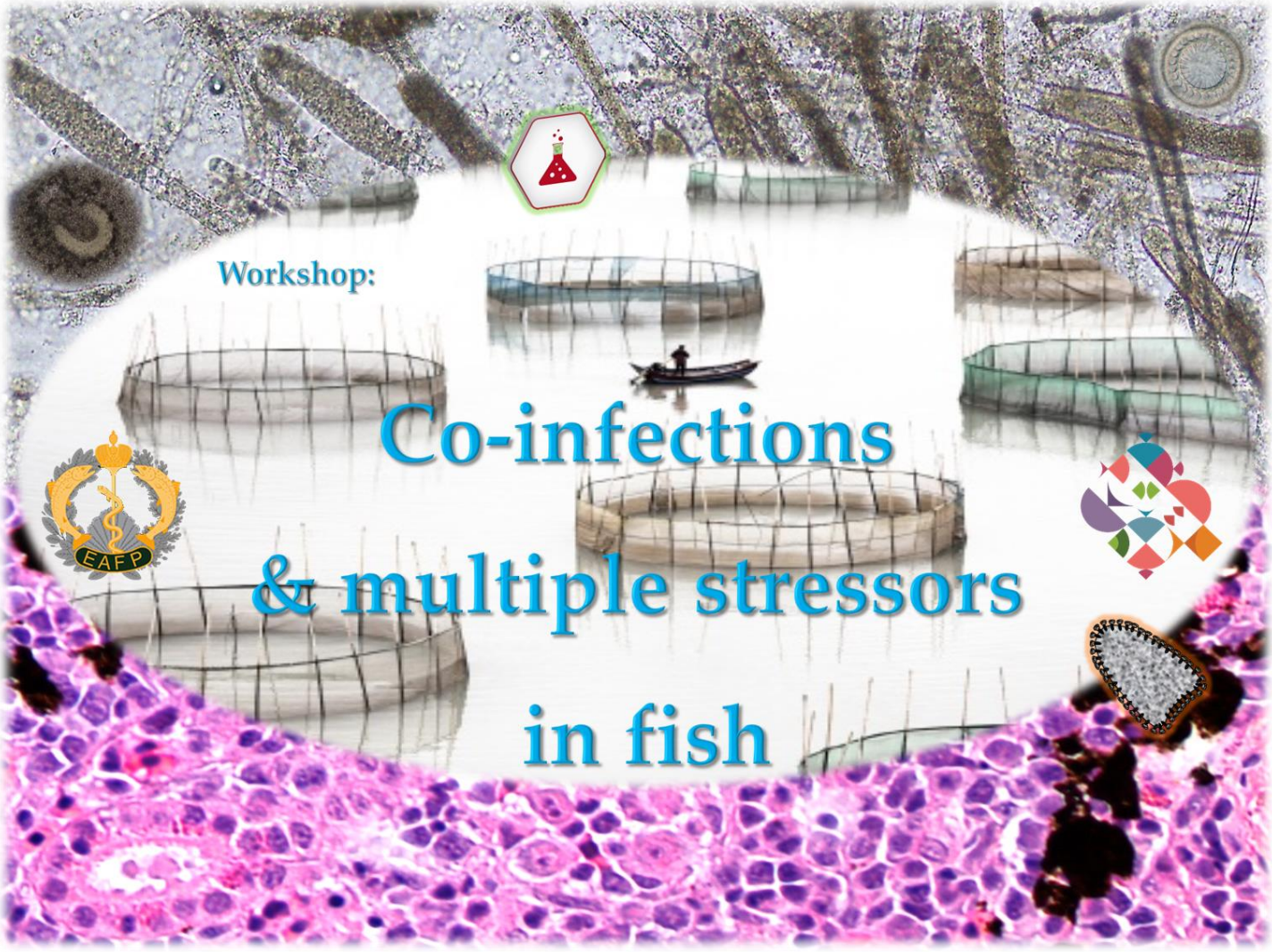

Farmed and wild fish populations are typically exposed to multiple physical, chemical and biological stressors. The cumulative impact of co-infections between parasites, bacteria, viruses and (a)biotic environmental pressures may trigger complex interactions, eliciting different pathological and immunological outcomes than classically assessed in highly controlled host-pathogen interactions. New studies specifically focus on the impact and dynamics of heterogenous co-infections affecting fish, both in salmonid and non-salmonid species. Furthermore, cross disciplinary studies attempt to measure the impact of environmental stressors in modulating the host response to pathogens. Scientific advances are needed to improve fish stock management, reduce pressure on natural populations and to design more efficient vaccination strategies and diagnostic tools. This EAFP-promoted workshop aims to raise awareness of ongoing research on the interaction between multiple infectious agents and (a)biotic environmental stressors to foster new studies and collaborations.

The workshop will be opened by Dr Mark Fast, from Atlantic Veterinary College at UPEI (Canada), with a keynote talk on:

"Pathological synergies in co-infecting pathogens are impacted by exposure order, and host response to initial infection"

We encourage researchers to join the "Co-infections and multiple stressors in fish" EAFP workshop, contributing with oral presentations and flash poster presentations. A joint article on this workshop will be published in the EAFP Bulletin.

19th International Conference on Diseases of Fish and Shellfish

Porto, Portugal

9th-12th September 2019

This is a EAFP open workshop, organised by:

Bartolomeo Gorgoglione (MSU, USA)

Christyn Bailey (CISA-INIA, Spain)

Laurent Bigarré (ANSES, France)

& **Olga Haenen** (WBVR, the Netherlands)

For additional information, please contact Dr B. Gorgoglione: BartGorg@msu.edu

19th International Conference on Diseases of Fish and Shellfish
Porto, Portugal
9th-12th September 2019

EAFP Workshop: Co-infections and multiple stressors in fish

Organisers: Bartolomeo Gorgoglione, Christyn Bailey, Laurent Bigarré & Olga Haenen

10th September 2019 – Alfândega do Porto Congress Centre, Room D. Luís

16:00 - *Keynote talk*: **Mark Fast -** "Pathological synergies in co-infecting pathogens are impacted by exposure order, and host response to initial infection"

16:30 - **David Bass** - "The pathobiome in animal and plant health"

16:45 - **Christyn Bailey** - "Expecting the unexpected: an analysis of multiple stressors and their physiological consequences for rainbow trout (*Oncorhynchus mykiss*)"

17:00 - **Marcia Saraiva** - "Saprolegniosis: who is there and why"

17:15 - **Olga Haenen** - "Multi-causal eel diseases in the Netherlands"

17:30 - **Mikolaj Adamek** - "*Flavobacterium branchiophilum* co-infection can increase pathological changes during koi sleepy disease caused by Carp Edema Virus infection in carp"

17:45 - **Bartolomeo Gorgoglione** - "Simultaneous and sequential co-infection patterns modulating rainbow trout response to BCWD and IHNV"

18:00 - **Simon Jones** - "Environment and UV-irradiation affect severity and timing of multiple infections in seawater-reared Atlantic salmon smolts in British Columbia, Canada"

18:15 - **Patricia Noguera** - "Gill histopathology scoring vs gross morphology and transcriptome analysis in farmed Atlantic salmon (*Salmo salar*)"

18:30 - **Victor Birlanga** - "Farmed Atlantic salmon microbiome on gills and mucous samples during an Amoebic Gill Disease episode: towards an early prediction"

18-45 - *Discussion - Flash Poster presentations*

18:45 - **Sara Ciulli** - "Multiple co-infections and environmental stressors as causes of chronic mortalities in juvenile sturgeons (*Huso huso*)"

18:50 - **Miroslava Palikova** - "Component causes of severe gill damage in rainbow trout farmed under conditions of RAS"

18:55 - **Isabel Aguirre-Gil** - "Pathogen interactions during experimental co-infection with *Piscirickettsia salmonis* and *Piscine orthoreovirus* in *Salmo salar*"