

Research projects

Katja Pulkkinen

Sources and sinks of columnaris disease in natural waters and in aquaculture

Maj & Tor Nessling foundation 2013

PI Katja Pulkkinen, PhD-student Sari Aaltonen, collaborators Dr. Heidi Kunttu, [Prof. Jouni Taskinen](#), [Dr. Lotta-Riina Sundberg](#),

The aim of the project is to study the sources and sinks of the pathogenic *Flavobacterium columnare* -bacterium in natural waters, and factors affecting the persistence and growth of biofilms at fish farms.

Evolution of virulence in a fish pathogen under variable resource stoichiometry

Academy of Finland -project 2012-2016

PI [Prof. Jouni Taskinen](#), Katja Pulkkinen, [post doc Nina Pekkala](#)

The emergence of infectious diseases is usually triggered by ecological changes, often associated with human interventions. Our recent evidence suggests that the fish pathogen *Flavobacterium columnare* has increased in virulence since it first emerged in Finland in 1980's. In this research plan we study the connection between resource nutrient ratios and the evolution of virulence in *F. columnare*. We will study the effect of nutrient ratios on the outcome of competition between strains varying in virulence, expression of virulence in low-virulent strains and the mechanisms related to nutrient requirements at molecular level. The study will contribute significantly to understanding agents of selection in the evolution of virulence, as well as in managing the biggest threat to salmonid farming in Finland, cured currently by antibiotics.

The neglected role of parasites in planktonic trophic cascades

Academy of Finland -project 2007-2011

Prof. Kalevi Salonen, PhD-student [Sanni Aalto](#), collaborators [Prof. Dag Hessen](#), [Dr. Marcin Wojewodzic](#)

In spite of the ubiquitous presence of parasites and variety of ways they impact on their hosts, the role of parasites in trophic cascades has been largely neglected. In this project we studied the role of parasites of the water flea *Daphnia* in planktonic trophic cascades. *Daphnia* waterfleas are an important part of food webs in lakes: they feed on algae and bacteria and are themselves eaten by many fish and fish fry. The stoichiometry (C:N:P-ratios) of *Daphnia* has been studied extensively, as well as the effect of different parasites on *Daphnia* hosts. By combining these two subjects, we studied the connections between host resources and host-parasite interactions at individual and population level both with lab experiments and in the field.