

Understanding fish and microbe interactions for aquaculture production and health

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Abstract:

Fish, like other animals, host a complex set of microbes in their gut, which play a crucial role in nutrition and health through host-microbe interactions. These microbes contribute to nutrient digestion, development of the immune system and defense from pathogenic microbes; therefore, the establishment of a healthy gut microbiome is important for host fitness. Over the past decade, we have gained knowledge on how the environment, the diet or the fish health status can shape the gut microbiome and fish performance. However, we still have to understand what is a healthy microbiome and how we can manage it through dietary, genetic or rearing interventions. While microbes can have profound effects on their hosts, we are only beginning to understand how microbial colonization either through feed or the rearing environment may shape host performance. When looking at larval stages, the rearing environment and the feed are important factors shaping the initial gut colonization, while their long-term effects on fish performance, health or disease resilience are not well-understood. Looking at microbial dynamics and microbe-microbe interactions can possibly indicate new targets for probiotic development or microbiome manipulation. In this presentation, I will discuss our latest research on host-microbe and microbe-microbe interactions in the fish gut, and how we can utilize this information to promote improved fish performance and health.