Repurposing trypanocidal drugs to tackle amoebic gill disease in Atlantic Salmon

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Introduction

Amoebic gill disease (AGD) is a devastating disease that causes multi-million-dollar loss annually in the salmonid fish farming business. The causative agent of AGD in Atlantic Salmon is *Paramoeba perurans* which belongs to the *paramoebidae* family. An interesting feature of most of the *paramoebidae* family members is the symbiotic relationship they have with the *perkinsela*-like organism (PLO). As there is a high level of metabolic interdependence between host and symbiont, elimination of the PLO, which resides adjacent to the nucleus of its symbiotic host, will hypothetically kill the parasite

The PLO, although losing its flagellum, belongs to the kinetoplastid group and contains many biochemical features similar to those of disease-causing parasites such as Leishmania and trypanosome. The use of anti-leishmanial and anti-trypanosomal may be able to kill the symbiont of *P. perurans*. In this study, we attempt to identify a candidate drug that targets PLO with via various drug assays and microscopy. Once identified the drug effect on *P. perurans* will also be explored using the omics approach (transcriptomics and metabolomics) to explore its mode of toxicity as well as to further probe the nature of this unique endosymbiosis. In addition to seeking treatment for AGD, repurposing drugs currently licensed for human and veterinary trypanomatids may be able to reduce their cost which is, in many cases, otherwise too expensive to implement to enable large scale treatment of neglected tropical diseases.

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