

## Popular science summary of the PhD thesis

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Title of the PhD thesis	<i>Renibacterium salmoninarum</i> : molecular tracing in the North-East Atlantic and infection studies in rainbow trout ( <i>Oncorhynchus mykiss</i> )
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### Science summary

*Renibacterium salmoninarum* is a slow growing, intracellular bacterium and the causative agent of bacterial kidney disease (BKD) in farmed and wild salmonid populations worldwide. The bacterium often presents within subclinical infections which may remain chronic, with bacteria able to hide and persist within asymptomatic fish carriers and spread by means of horizontal and vertical transmission. No gold-standard has been established for BKD diagnoses, and no vaccines nor treatment have proven effective due to the unique features of *R. salmoninarum*.

With this PhD, I investigated the past and present movements of *R. salmoninarum* in the North-East Atlantic elucidating the phylogenomic relationships of a large collection of isolates, including those related to the BKD epizootics developing in Norway between late 2022 to 2024.

Furthermore, the work advanced the understanding of key aspects of *R. salmoninarum* infection biology in rainbow trout, including infection dynamics, influence of environmental factors such as water temperature, the potential of environmental DNA to monitor the disease, and rainbow trout responses during infection.

An *in-vivo* cohabitation infection model with *R. salmoninarum* in rainbow trout was established that mimics natural transmission and reproduces subclinical infections typically observed under field conditions, providing a valuable framework for future studies on persistent infections.

Altogether, the work highlights the need to further unravel how this pathogen persists in aquaculture settings, where long-term infection reservoirs can undermine disease control and biosecurity efforts.