

# Cost of resistance against viruses: is it real?

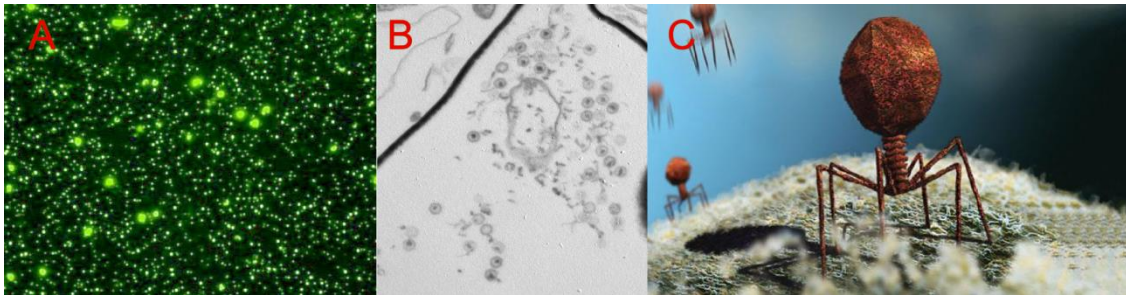
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**Research Group:** Marine Microbiology, Department of Biology, UiB.

## Background:

Viruses are extremely numerous in aquatic environments and are believed to play a very important role in the control of microbial populations. Notably, it is hypothesized that by killing the fittest microbial cells (those that grow faster), viruses provide a niche for other slower growers to exist, and hence contribute to the high levels of microbial diversity observed. Accordingly, for slow and fast growing cells to co-exist, this theory would imply the existence of a “Cost of Resistance”. This means cells that can resist well viral infection have to lose part of their growth capacity. But is this real???

*In this project we will be seeking for the existence or not of the “Cost of Resistance”*



*Viruses so numerous in the oceans... A – epifluorescence microscopy of natural seawater sample, every little dot is a virus. B – Viruses infecting a microalgal cell. C – Illustration of a marine myovirus infecting bacteria.*

## Objectives:

The student in our project will work with a vast collection of microalgae and viral strains to empirically derive “Cost of Resistance”. Following are the major tasks to be performed:

1. Cross-infectivity experiments will be performed, with the use of flow cytometry to measure microbial and viral progressions.
2. Each algal strain will be characterized by measuring its exponential growth rate and its capacity to resist infection from a range of viruses.
3. Viral strains will be characterized on their capacity to infect a range of hosts.
4. Empirically-driven values will be used to ameliorate currently existing models for host-virus interactions.

## Practical competences the student will acquire:

- (1) basic microbiology culturing techniques;
- (2) microscopy and flow cytometry;
- (3) molecular tools (extraction, amplification and sequencing of DNA); editing and analysis.

## Outreach:

One publication in a high profile scientific journal:  
(e.g. Environmental Microbiology or Virology Journal).

## Contact for further information:

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