

Building the marine mammal virome

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Dr. Tiong Aw, assistant professor of [environmental health sciences](#) at the Tulane University School of Public Health and Tropical Medicine, will use a grant from the Office of Naval Research at the U.S. Department of Navy to build the virome database of marine mammals and their habitat.

It will also provide a rapid protocol for viral screening and quantification in the field that will ultimately improve the surveillance of infectious diseases in marine mammals and allow for the early detection of viral pathogens.

The altered state of marine ecosystems around the world has been increasingly linked to anthropogenic activities such as urbanization, pollution, and climate change. Marine mammal populations in particular face numerous threats to health due to their close proximity to human as well as natural stressors.

Viral diseases of marine mammals have been difficult to study. As a result, there's been limited knowledge on emerging known and unknown threats to animal health.

A comprehensive view of the virome (the genomes of all the viruses that inhabit a particular organism or environment) would help infectious disease surveillance in this animal population. Dr. Aw proposes using a handheld DNA sequencing device coupled with improved sampling platforms to build the virome database.

"We can now use new technology to take a glimpse into the world of viruses, which are the most abundant biological entities," Dr. Aw said. "This early detection is an important way to prevent outbreaks associated with viral pathogens."

The U.S. Navy uses various marine mammals, particularly bottlenose dolphins and sea lions, for national defense purposes. The health of these animals is of the utmost importance. Exposure to viral pathogens in marine environments poses a significant health risk for these animals, and therefore a risk to national defense.

This unique project combines the expertise of a multidisciplinary [One Health](#) team with new technologies to better understand and prevent viral diseases. This novel onsite viral screening and quantification approach will provide to the Navy with an initial surveillance of the virome in marine mammals' habitat.