

Project/Meeting title

Using Insect Specific Viruses for Arbovirus Control in Mosquitoes (category D)

Members

Principal investigator:

Maria-Carla Saleh (Institut Pasteur, Paris, France)

Contributing members:

Sarah Merklings (Institut Pasteur, Paris, France)

Yasutsugu Suzuki (Ehime University, Faculty member of LaMer)

Kozo Watanabe (Ehime University, Faculty member of LaMer)

Report

Our original plan was set to visit Ehime University for the LaMer Special Seminar series, entitled "Using Insect Specific Viruses for Arbovirus Control in Mosquitoes". However, the planned meeting and symposia were unable to be held due to the COVID-19 pandemics.

Despite this roadblock, our collaboration moved forward in a virtual manner. We had several online meetings to discuss the related topic that is insect-specific viruses (ISVs) in mosquito vectors. Mosquitoes harbor commensal ISVs, which are not infectious to vertebrates. Several studies have shown that ISVs can suppress the replication of arboviruses in cell culture and *in vivo*. However, the mechanisms underlying anti-arboviral effects remain still unclear. In addition, there are few studies on the biology of ISVs in mosquitoes. We exchanged ideas on how we could tackle these questions about ISV biology. Our collaborative work aimed to understand the fitness costs of ISV infection in mosquito vectors. For that, we provided *Aedes aegypti* mosquito lines and one of the most common ISV, cell-fusing agent virus (CFAV), to Dr. Suzuki and Prof. Watanabe. They have established the first *Aedes* mosquito rearing and viral infection system at Ehime University with these materials. The project sprang under the initiative and has been led by Dr. Suzuki. The preliminary results showed that *Aedes aegypti* mosquitoes' life span was not affected by CFAV infection (figure 1). This result suggests that the infected mosquitoes can compete with uninfected ones in the field, and it supports

the use of ISVs in arbovirus control.

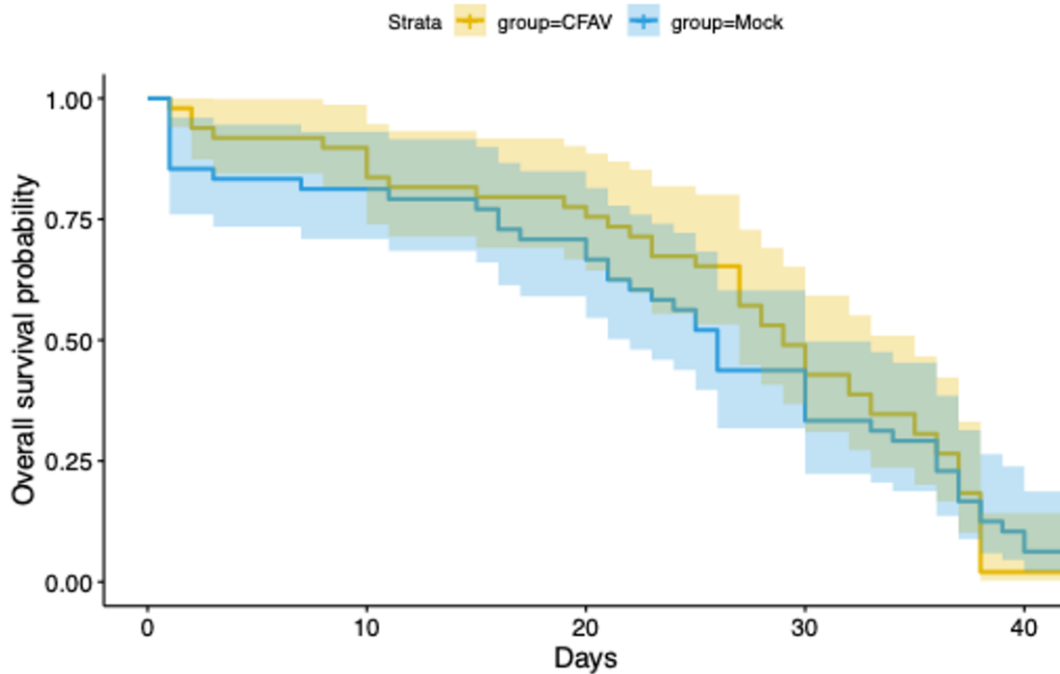


Figure 1. Survival curves (Kaplan–Meier method) for CFAV- or mock-infected *Aedes aegypti* mosquito. Yellow and blue indicate CFAV and mock infection, respectively. Survival estimates with 95% confidence intervals are shown as the shaded area of each corresponding color.

As mentioned above, due to the restrictions imposed by the Covid-19 pandemic, we could not visit Ehime University and organize the seminars series during this fiscal year. However, the LaMer grant gave us an excellent opportunity to launch and advance our international collaborative work. We are looking forward to continue this project hand-in-hand in the next future. And we hope the covid-19 situation will soon allow us to visit Ehime University for our seminars during the next fiscal year.