Project title: Dengue vaccine development

Project summary:*  

Dengue hemorrhagic fever is an important vector-borne disease with an increasing disease burden in many tropical and subtropical countries worldwide. Although the mortality is low with proper diagnosis and treatment, high incidence in Thailand and many other countries has made it an important public health problem. Many approaches for vector and disease control have been attempted and failed. An effective dengue vaccine is urgently needed. Despite all the effort and investment, effective dengue vaccine is not yet available. Thailand has been engaging in dengue vaccine research and development for more than two decades.

There is now a national dengue vaccine pipeline with live-attenuated, DNA, and viral-like particle vaccine candidates. All preclinical developments have been committed and supported by key governmental granting agencies especially the Thai BIOTEC, the National Science and Technology Development Agency (NSTDA). Some of these candidates are being tested in primates and should be ready for clinical trials within 1-2 years. They are being tested in combinations in a novel prime-boost strategy, which has shown very promising results. The prime-boost approach should solve many of the problems currently faced by other dengue vaccine candidates. Newer strains of 4 serotypes have also been used for the vaccine designs in DNA and VLP vaccines. This project proposes to move forward this vaccine R&D program by producing clinical lots of tetravalent vaccine candidates and conducting phase I clinical trial. In addition, immunological assays are being developed and evaluated for their correlation with immune protection. Two potential GMP production facilities have been collaborated: one private vaccine company, the other is the national GMP pilot facility.

Capacity building for vaccine R&D and production has been set as a national agenda for Thailand. Dengue vaccine development is among the top priorities, not only because dengue vaccine is badly needed but also it can be used as a model for capacity and human resource development. With promising vaccine products to be launched, production capacity can be purposefully established and maintained. It will strengthen national vaccine capacity and self-reliance. This will also provide affordable vaccine to the developing world and Thailand will collaborate with other developing countries to maximize access to the vaccine.

In term of regional collaboration, we are currently collaborating with the Bogor Primate Research Center, Bogor Agricultural University, Indonesia on non-human primate vaccine testing. If this proposed program is funded, through the advice from WHO, more scientific input and collaboration will be expanded such as from the Pediatric Dengue Vaccine Initiative (PDVI; the IVI, and SEA researchers that actively involve dengue researches. And additional regional GMP facilities can be further explored if needed.

*As taken from original proposal template, question 5.