ImmunoTools *special* Award 2015

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Effects of Thai medicinal plant on viral infection

Dengue virus (DENV) is recognized as the most rapid and effective spreading arboviruses. There are 4 closely related serotypes, which are DENV-1, to DENV-4. The symptoms of DENV infection vary from asymptomatic to severe lifethreatening illness. The World Health Organization (WHO) has estimated that 2.5 billion people from more than 100 countries are at risk of dengue infection. Thus, around 100 million of dengue cases were reported each year. Among the infected individual 250,000-500,000 cases develop a lifethreatening syndrom (DHF/DSS)-which require hospitalization and causing death mainly in children in many areas.

Another well recognized arbovirus is Chikungunya virus (CHIKV). Epidemics of CHIKV occurred here and there since 1952. The most recent outbreak occurrs in 2004 in Kenya and then spread to several parts of the world especially African and Asia counties. Up to October 2014, epidemic of CHIKV remains in the Caribbean. The typical symptoms of Chikungunya infection are high fever, rash, headache, myalgia and arthralgia/arthritis. Around sixty percent of patients show persistent joint pain from weeks, or even several years. This affects the ability to perform daily life activities.

One common issue between these two viruses is there is no available vaccine and antiviral agent.

Several researches have explored the antiviral activity from the chemical compounds, and from the medicinal plants. Medicinal plants are the one of the valuable resources that scientists are attempting to search for the novel therapeutic agents due to a lower side effect and higher accessibility of them over chemical treatments. In addition, numerous plants have been used for treatment of infectious diseases since an ancient time.There are many traditional medicinal plants in Thailand that have been reported to have an effective antiviral activity. For example,

the ethanol extracts of *Rhizophora apiculata* Blume., *Flagellaria indica* Linn., *Cladogynos orientalis* Zipp., and *Houttuynia cordata* Thunb. show the inhibitory effects on DENV-2. In addition, *Cladogynos orientals* Zipp., *Piper retrofractum* Vahl. and *Rhizophora apiculata* Blume. also exhibited an inactivated viral particle activity. Moreover, another plant extracts from *C. formosum* (leaf) and *C. longa* (bulb) significantly decreased the level of HBV cccDNA.

I am currently searching for anti-DENV and anti-CHIKV activities in two Thai medicinal plants. The preliminary results showed the inhibitory effects of these two plant extracts on DENV and CHIKV replication in infected vero cells. However, our main objective is to explore the effects of plant extracts in primary human target cells of DENV and CHIKV which is monocytes and synoviocytes, respectively.

ImmunoTools reagents will be beneficial for us to understand the mechanisms of these plant's-derived compounds on the *in vitro* inhibiting of DENV and CHIKV infection, on purification and cultivation of monocytes, and on the effect of medicinal plants on mediators released from treated monocytes and synoviocytes. Hopefully, we will get the new antiviral drugs that will safe many people around the world from those disease by this challenge opportunity providing by ImmunoTools.

ImmunoTools *special* AWARD for **Nithipong Mapratiep** includes 25 reagents

APC - conjugated anti-human CD11c,

recombinant human cytokines: rh RANKL, rh M-CSF, rh GM-CSF,

human ELISA-set (for one 96 plate) - human IFN-gamma, human IL-4, human IL-6, human IL-8, human IL-10, human IL-12p40 total (detect IL-23 as well) , human TNF-a, (each 3 reagents) DETAILS more AWARDS