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Project Title: Active surveillance and laboratory diagnosis of Arbovirus  
Project Number: DOH96-DC-2002  
Executing Institute: Centers for Disease Control, Department of Health  
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P.I. Institute: Research and Diagnostics Center

Abstract:

In the global trend of economic integration, international trade and tourism have become increasingly frequent and convenient providing favorable conditions for the international spread of emerging and re-emerging infectious diseases endangering human health. How to respond to this threat of infectious disease outbreaks in the global pandemic by establishing more efficient international monitoring network and modernization inspection system have been extremely important challenges. Since the SARS outbreak in 2003, Taiwan CDC had implemented a fever screening at airports active surveillance program utilizing infrared thermal detection instrument to monitor potential imported cases with various infections (including new influenza, malaria, intestinal disease, plague, dengue fever, yellow fever, chikungunya fever, etc.). The surveillance system has been proven to be successful in the detection of imported cases supported by the devoted diagnostic laboratory, which allows timely control measures to be implemented to prevent further spread of the imported pathogens. As global warming impact, the geographic distribution and case numbers of vector-borne infectious diseases are rapidly increasing. Among them, the mosquito-borne and tick-borne arboviruses are the most important. The main objective of this project is to establish a laboratory-based surveillance system for the detection of arboviruses. In 2007, we established diagnostic tests for the detection and differentiation of various flaviviruses and alphaviruses. A multiplex real-time RT-PCR has been developed to simultaneously detect various flaviviruses and alphaviruses in the acute-phase serum samples. In addition, a sensitive and specific alphavirus-specific ELISA was developed to detect and differentiate chikungunya virus infection from flavivirus infections. Through fever screening at airport surveillance, we have so far identified 60 imported dengue cases and 1 chikungunya case.

Keyword: fever screening at airport, dengue fever, chikungunya fever, multiplex real-time RT-PCR, ELISA