

USF and the Florida Department of Health collaborate on

mosquito

By Randolph Fillmore

Dengue Fever and Eastern Equine Encephalomyelitis are just two of the many serious threats to public health in Florida. While these diseases occasionally raise their heads in the news, most Floridians are apt to take a quick look and listen and then go back to life as usual.

Graduate students in the University of South Florida College of Public Health's Department of Global Health, however, take those threats seriously. And, working with the Florida Department of Health (FDOH), they not only keep a sharp eye on these dangerous diseases but are finding new and better ways to identify and track them, thanks to an important collaboration.

"We have a unique research training collaboration with the FDOH," explains Department of Global Health Chair and Professor Boo H. Kwa, Ph.D. "Our students get practical laboratory research training in disease surveillance by working with Lillian Stark, Ph.D., who is a senior scientist and virologist with the FDOH. Not only do the students and USF benefit from the collaboration, the citizens of Florida benefit as well."

USF students are finding new and better ways to track viruses such as Dengue fever, West Nile virus, and Eastern Equine Encephalomyelitis—all of which are vectored, or transmitted, by mosquitoes.

Julia Gill, Ph.D., M.P.H., a recent

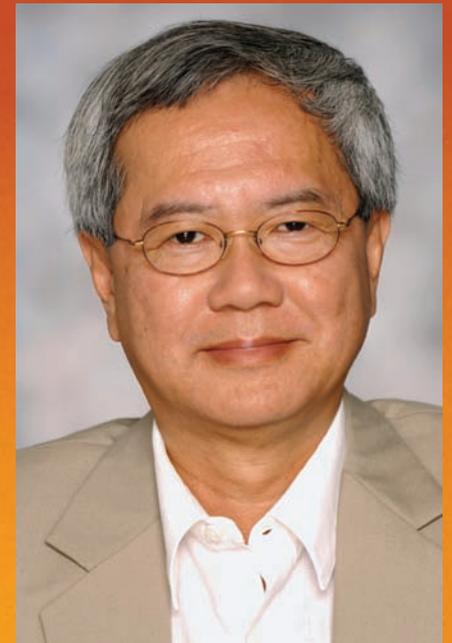
graduate who now is the State's Epidemiology Bureau Chief in Tallahassee, did her Ph.D. dissertation on methods of Dengue fever surveillance. According to Kwa, Gill changed the understanding of how Dengue is imported into Florida and helped improve diagnostic methods.

Gill credits the collaboration between USF's College of Public Health (COPH) and the FDOH as having been essential to her work.

"The collaborative program between USF and FDOH matches young public health scientists with their interests," says Gill, whose work in identifying active cases of Dengue fever was boosted by USF's collaborations with not only FDOH but the Centers for Disease Control (CDC) as well.

Gill's surveillance research on Dengue fever, a debilitating disease endemic in Central and South America and the Caribbean, helped raise an alarm when she found that more cases were being brought to Florida than previously thought. Earlier surveillance suggested that only one or two cases of Dengue were being imported to Florida annually. With better surveillance techniques designed by Gill, she found that 19 cases were imported to Florida in a given year.

"Dengue and St. Louis virus are in the same family and react to the same antibodies," explains Gill, who sorted out the differences between the two. "It was also thought that the virus circulated in



Boo H. Kwa, Ph.D.

the human body for about four days, which meant that by the time infected travelers returned to Florida, it was gone."

Such was not the case, as the surveillance program showed. Four different serotypes were found in returning travelers in Florida, and multiple serotypes increased the chance of the hemorrhagic variety that can be quite dangerous.

"Having the FDOH facility on the USF campus meant that we had excellent lab capacity for carrying out this work," says Gill, who continues to act as a preceptor for USF College of Public Health student interns promoting collaborative projects.

"Transitions like Gill's, from academics to practice, make big differences," says Kwa.

"Dr. Gill's research on dengue and her transition into an outstanding career in Public Health is a brilliant example of how one may bridge academic research to address a potentially serious public health problem," says Kwa.

Eastern Equine Encephalomyelitis, commonly called "EEE," is found in North, Central, and South America and infects mammals, birds, and reptiles. It is transmitted via mosquitoes, ticks, and

surveillance

lice. Department of Global Health doctoral student Christy Voakes Ottendorfer, M.S.P.H., carried out research that gave public health officials a tool distinguish between infections caused by EEE from those due to a related virus, Highlands J (HJ). The keys to constructing a better surveillance program for EEE came with her work on the “Sentinel Chicken Arbovirus Surveillance Program” through which public health officials in Florida counties submitted weekly serum samples of chickens thought to be infected with a virus. Which virus—EEE or Highlands J—or some other was the question.

“Highlands J is nonpathogenic and considered a nonrisk for humans,” she explains. “EEE, on the other hand, is pathogenic and serious for humans. By extracting the RNA from the tissue samples and putting the samples through polymerase chain reaction (PCR) testing, we were able to differentiate the genetic bases of the two viruses and tell them apart.”

The study showed that both EEE and HJ viruses circulate in several counties statewide. Now, local mosquito control agencies use this information to target EEE “hot zones” for enhanced mosquito surveillance and control to prevent outbreaks of this dangerous disease.

Her dissertation project focuses on West Nile virus (WNV) and St. Louis encephalitis virus (SLEV).

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“This study has isolated these viruses to gain an understanding of WNV and SLEV strains that are currently circulating in Florida. By characterizing these isolates, I hope to rapidly identify human epidemic (virulent) strains from weaker strains of these viruses.”

The next step would be to alert mosquito control and health agencies that a dangerous strain of the virus has been isolated in the field and to take precautions before it reaches the human population.

According to Lillian Stark, Ph.D., M.P.H., M.S., of the FDOH, Bureau of Laboratories, USF students are guided towards applied research projects that produce actual improvements in the way the FDOH works to protect the health of Floridians.

“The collaboration works well for us and the students, who bring an enthusiasm and zest for discovery that enhances all of our work,” says Stark.

The history of the USF COPH and

FDOH collaboration goes back to the 1970s when Stark, who already had a Ph.D. in biology, went to USF to get her master’s degree in public health and, in doing so, found that USF students were “a superb source” to help carry out

studies. Since the FDOH moved onto the USF campus in 2001, the collaboration has become closer and easier because students can attend class and quickly get to the FDOH lab to do research.

“Collaborations between FDOH and academia benefit students, who gain a better understanding of practical, real-life public health problems, learn how disease surveillance is conducted, learn laboratory methods, study how outbreaks are identified, and learn the need for timely and effective communication to the authorities,” concludes Kwa. “FDOH benefits from highly motivated, energetic young minds who can contribute by helping to research, organize and analyze the huge amounts of data sets.”