

[International Research]

Researching a deadly disease with leading research firm

JMU and SRI ink formal partnership

By ALEX SHARP ('11)

Tina Safavie ('11) has been fascinated by viruses since her sophomore year of high school. This year, the biology major got hands-on experience working with a little-known tropical virus at one of the premier biotech companies in the world — SRI International.

JMU helped woo SRI International to the Shenandoah Valley nearly four years ago, and this summer the university and SRI signed an agreement that, among other things, will provide JMU faculty and students research opportunities at SRI while affording SRI employees access to JMU labs and other resources.

Safavie's experience at SRI included adding dengue virus to "secret" compounds synthesized by SRI, and then adding that mixture to African green monkey kidney cells to check for inhibition of the infection. An effective compound exhibits little to no growth of infection.

The World Health Organization states that about 2.5 billion people are at risk of contracting mosquito-borne dengue fever, and that about 500,000 are hospitalized every year for the more dangerous dengue hemorrhagic fever. And that is a big problem since there is no effective treatment for the illness.

"There are no antivirals and there are no vaccines," says Safavie, who worked with a research team seeking an antidote for dengue fever at SRI's Center

Tina Safavie ('11) hopes her hands-on research will help find a vaccine that prevents the transmission of the sometimes-fatal dengue virus.



for Advanced Drug Research. Safavie worked closely with SRI virologists to screen various compounds for their anti-viral effects on the sometimes-fatal virus.

Symptoms of an initial infection are similar to influenza and include high fever, headaches, joint pain and rash. People who are infected a second time can contract dengue hemorrhagic fever, a potentially fatal complication that involves a high fever that lasts from two to seven days and may be followed by circulatory failure, which causes the body temperature to drop dramatically and the patient to suffer shock syndrome.

Most cases of dengue fever and DHF occur in under-developed

tropical nations, says Krishna Kodukula, director of SRI's Center for Advanced Drug Research and leader of the dengue project. The disease is rare in the United States, but as global temperatures increase and the mosquito breeding range broadens, he thinks there will be more infections and a larger risk area. "We feel that more outbreaks will occur in the U.S.," Kodukula says, noting that this summer about 1,000 people in Key West, Fla., were diagnosed with dengue fever.

Safavie first learned of dengue — and the internship offered by SRI — in a global infectious diseases class taught by JMU biology professors Chris Lantz and Amanda Biesecker. Lantz

Tina Safavie ('11) spent part of her senior year researching a tropical virus with premier researchers at SRI International in Harrisonburg.

has worked directly with SRI since 2007. "Students who take this course are very good candidates to move into internships at SRI," Lantz says of the three-credit biology class that explores six global diseases — malaria, AIDs, tuberculosis, cholera and little-known tropical diseases leishmaniasis and dengue fever.

DHF, which is now endemic in more than 100 countries, qualifies as a major disease. The World Health Organization reports that "not only is the number of cases increasing as the disease is spreading to new areas, but explosive outbreaks are occurring." An outbreak in Venezuela in 2007 involved more than 80,000 cases of dengue fever, 6,000 of which were DHF, the agency reported.

Which gives some urgency to the project at SRI. The goal is to create an effective anti-virus, and ideally, a vaccine that prevents the transmission of dengue.

"I always knew that I was into biology, because with biology, you can explain life," Safavie says. "And sometimes you can also save lives." ❧

* Read more about Safavie's research at www.jmu.edu/news/madison scholar/2010_SRI_Intern.shtml

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