

"Each of you has the opportunity to carry the torch. Each of you has the opportunity to make this country even greater than it is. Each of you has that opportunity to stand on the victory stand, and again in your own minds, in your hearts, in the visions of your families and the rest of the world, to watch your flag rise higher than all the others, to hear your anthem playing, and to declare that you're a champion. You bring honor to us all, not just by being here, but because you have carried along a strong tradition of excellence.

DR. HARVEY W. SCHILLER, '60
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Amid the arcane equipment and vials of mysterious liquid in Byrd Hall's third floor chemistry labs where Cadet Sermpun Lhamlhak sits quietly studying the results of his research, the atmosphere is reverent and far removed from the boisterous activity just across Jones Avenue in Stevens Barracks.

The first class cadet is working to separate and characterize two biotoxins produced by *Gambierdiscus toxicus*, an algae found

off the Gulf of Mexico, the Caribbean and other tropical marine environments. These biotoxins build up in fish and move through the food chain. Although not usually harmful to fish, the toxins can cause diarrhea, vomiting, numbness and tingling, muscle aches and low blood pressure in humans who eat contaminated fish.

The isolation of the toxins was actually begun by chemistry professor Capt. Kevin Crawford in 2000 in conjunction with the National Ocean Service Marine Biotoxins Program. Lhamlhak is the third cadet to continue the research.

"Developing a process to isolate the toxin is not as simple as you would think," said Crawford. "The toxin is not a stable molecule, and it decomposes over time. The identification of a similar toxin

found in the Pacific has given us a guide to go by."

The *Gambierdiscus toxicus* is grown in the lab at the National Ocean Service. The first step in purifying the toxins was to dissolve the toxins away from solids, using methanol. Next, molecules were separated based on size. Currently, Lhamlhak, 24, is trying to group the molecules according to their charge. Because the Pacific strain has a negative charge, he and Crawford know the *Gambierdiscus* will have one too. In the final step, Lhamlhak will use the high performance liquid chromatograph (HPLC) to separate the compounds. The HPLC is one instrument purchased through the Schiller Science Initiative.

What is the purpose of purifying the toxins? After they are purified, they can be studied to see how they act in the human body so that health care personnel are better able to treat people who consume fish contaminated with the toxins. Also, because of the way the toxins work, killing off cells, they can be studied as a potential anti-cancer drug.

"Without Dr. Schiller's gift to the chemistry department, we wouldn't be able to continue this research," Crawford said. "We're grateful to him for his generosity."

Lhamlhak is also thankful. The 24-year-old native of Bangkok is at The Citadel on a military scholarship from the Thai government. After completing his chemistry degree at The Citadel, he hopes to attend graduate school in the United States. Afterward, he will return to Thailand to serve as an officer in the army.

"This is a wonderful opportunity," he said. "I feel very fortunate to be able to work on such an important research project."

It is an opportunity to carry the tradition of excellence Schiller envisioned and to become a champion whose work will make a difference.

