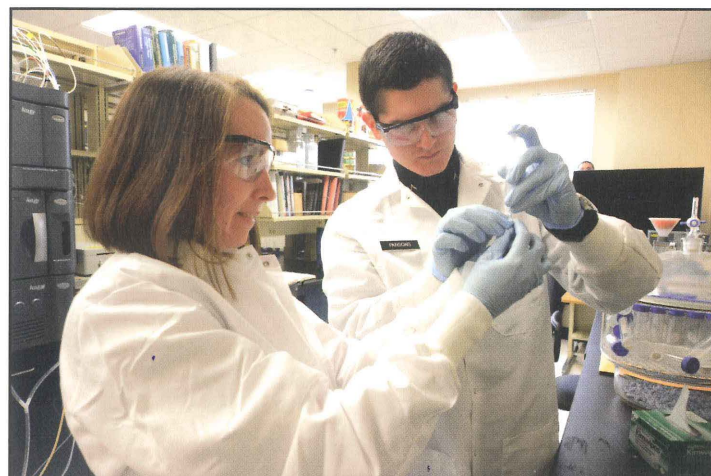


Biology Research Riding Wave of Support

BY SHERRI TOMBARGE



Matthew Waalkes isolates a stem tissue for image analysis. – VMI Photo by John Robertson IV.



Maj. Anne Alerding helps Garrett Parsons prepare a sugar sample for analysis. – VMI Photo by John Robertson IV.

VMI's robust undergraduate research program doesn't just happen. It thrives, and thrives only because at VMI we get a whole lot of help from our friends.

Case in point: Maj. Anne Alerding's project to develop clean-burning biofuel from stem residues of prolific soybean plants whose beans have already been harvested for food. Alerding's is one of few biofuel projects that use a common agricultural plant yet do not compete with the plant's use as food – and two cadets are benefitting from extensive work in the lab this year, with many more to benefit in the future as this long-range, many faceted project continues.

Making it all happen are grants from sources both public and private totaling \$150,776.

"This is beyond my dreams. ... This is a world class lab now; it's competitive with any you'd find at U.Va. or Virginia Tech," said Alerding. "We're well equipped."

Located in a recently renovated portion of Maury-Brooke Hall, a renovation project still under way, Alerding's lab has benefitted first from funding for the renovation, which included \$66,500 for an ultra performance liquid chromatography system (UPLC), enabling Alerding and Cadet Garrett Parsons '15, to measure cell wall chemicals in soybean stems.

For biology major Parsons, the project has introduced a whole new way of thinking about plants.

"The combination of biology – the cellulose, the hemicellulose – [and] the breakdown through acid hydrolysis ... was an introduction for me from biology into chemistry." He entered his first chemistry class this fall a few steps ahead of his classmates after a summer working in Alerding's lab on a stipend funded by a \$20,000 renewable grant from the Jeffress Memorial Trust.

That grant funded Alerding's own salary over the summer, as well as travel for her and Cadet Matthew Waalkes '13 to several conferences;

a \$1,300 muffle furnace for measuring cell wall chemistry in soybean powder; a \$1,700 column heater and computer for the UPLC machine; \$6,500 for consumable lab supplies; and salaries and stipends for research this summer.

Waalkes, too, has learned to think a whole new way about science.

"In a textbook there are a lot of certainties," said Waalkes, a biology major with minors in chemistry and writing. "But in a research lab, you start to realize that science is full of uncertainties. It becomes much more interesting, it becomes much more exciting."

Waalkes has been studying the tissues of the soybean stem through digital microscopy using the biology department's Nikon Eclipse 80i research microscope. He analyzes the tissues using ImageJ software developed by the National Institutes of Health. He analyzes those results using Mathematica, with advice from math department head Col. Troy Siemers.

Waalkes' work on the project includes a Summer Undergraduate Research Institute – SURI – project and travel to present in the graduate

student division at the American Society of Plant Biologists Southern Section Regional meeting, both through the Jackson-Hope Fund; study of soybean slides prepared through a contract funded by a Jackson-Hope New Directions in Teaching and Research Grant; and a Swope summer research stipend funded by the VMI Foundation's Watkins-Southard Fund.

Alerding's research began two years ago with the selection and planting of five soybean cultivars. It will continue this summer with the bioengineering of the best of these to produce the cleanest possible fuel and with extensive testing and development by Maj. Tim Moore '97 and his cadets in his lab.

Both studies are part of VMI's Clean Energy and Air Resources – CLEAR

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Support from Near and Far - \$150,776

\$66,500 ...Construction funds – Equipment
\$300 ...Wetmore Fund – Equipment
\$3,935 ...VCUR through Jackson-Hope Fund – Stipend, travel
\$5,276 ...Grants-in-Aid of Research, VMI Foundation – Supplies
\$10,668 ...Jackson-Hope Fund – Slide preparation, travel
\$7,700 ...Office of the Dean – Equipment, maintenance contract
\$26,397 ...Department of Biology, ETF, Swope through Watkins-Southard, and Carroll funds – Equipment, stipends, travel
\$30,000....Jeffress Memorial Trust – Stipends, travel, equipment, supplies

Research Seeks to Honor Veterans by Aiding Adjustment to College

BY MARY PRICE

Two faculty members of the VMI's Department of English and Fine Arts are about to publish their research on an increasingly relevant subject: the experience of military veterans returning to the classroom, and particularly the writing classroom, at colleges and universities across the nation.

"I've always been interested in ways that my experience in the active service can inform both my teaching and my research," said Cmdr. Alexis Hart, who served on active duty in the U.S. Navy for six years before entering academia.

Hart said that her interest in researching veterans' experiences began in the spring of 2010, when she heard a speaker at the Conference on College Composition and Communication, more commonly referred to as the "4Cs," mention that professors have an ethical obligation to help veterans returning to the classroom make the often-difficult adjustment to higher education.

Hart teamed with colleague Col. Roger Thompson to obtain a \$10,000 grant from the 4Cs that would help them explore ways colleges and universities could ease the transition for their veteran students. Thompson, although not a veteran himself, had developed a background in veterans' issues, when he ghost wrote *Beyond Duty: Life on the Frontline in Iraq*, a war memoir, with retired Army Capt. Shannon Meehan '05, a former student of his. The book was published in 2009.

In the fall of 2011, Hart took faculty development leave from VMI to travel around the country and talk to writing center consultants, veterans programs' coordinators, and higher education administrators about their experiences helping veterans adjust. Thompson did not take leave, but traveled as he was able to do so. Between them, Hart and Thompson visited over 50 schools, using writing centers as their usual jumping-in points.

"Our premise and idea was that writing is typically a universal requirement at colleges and universities," said Hart of the decision to

A Decade of War: Institutional and Civic Responsibilities to "Warrior Writers" in the College Writing Classroom

Alexis Hart and Roger Thompson
Virginia Military Institute

focus on writing courses. "Writing is a course that all students are going to be asked to take."

In many instances, Hart and Thompson found that faculty had had little training in dealing with veterans' issues, and when they did have training, it tended to have focused on the problems sometimes associated with veterans, such as post-traumatic stress, rather than the assets that these students often bring.

Making sure that these assets are given equal weight is an essential point for both

Hart and Thompson. In an article written for the Institute for Veterans and Military Families at Syracuse University, where he's currently serving as a senior fellow, Thompson wrote that veterans, "often have significant leadership training, a dedicated commitment to teamwork and collaboration, and a focus on achievement and success that promises to make them exceptional students."

Hart referred to what's often viewed as a clash of cultures between the military and academia as "problems of translation." Members of both cultures need to be willing to understand each other, she said, so they can move forward with productive relationships.

"One of the things we'd like our research to result in is a raising of awareness, and perhaps some more deliberate training, on the part of writing program administrators," Hart remarked.

Like Hart, Thompson spoke of the lack of that awareness, and a lack of faculty training, as a significant weakness at many schools. He said he was heartened, though, by the instances in which veterans themselves had brought about change. At San Diego State University, Thompson noted, there is now a fully staffed veterans' resource center and a dormitory just for veterans and their families — all because one veteran lobbied for change.

"The vet populations and the effects of war are going to be long lasting and . . . should not be invisible," said Thompson. "Those voices need to be heard, and they need to be honored in some way."

Biology Research

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— Program, a project that received a \$40,000 Dominion Resources Higher Education Partnership Grant last year.

Alerding's work has been supported by a Wetmore Fund grant to Parsons, VMI Foundation Grants-in-Aid of Research funding, Virginia Equipment Trust Fund money, the Carroll Fund, and funding provided by the dean's office, all of which is supporting work that is cutting-edge both in its procedures and in the interdisciplinary nature of its subject.

It all started for Alerding, after all, when she was approached by Moore, an assistant professor of civil engineering who studies pollutants, looking

for a collaborator to work with him on a submission in response to a call for proposals on biofuel research.

"I was approached by a civil engineer on a problem — he didn't know much about plants, and I didn't know much about making biofuel," said Alerding. "We put it together from there."

Alerding continued, "There's a new wave in research for interdisciplinary problem solving."

And, thanks to a lot of help from sources both public and private, VMI's riding the crest.