



# Vermont Genetics Network

2019

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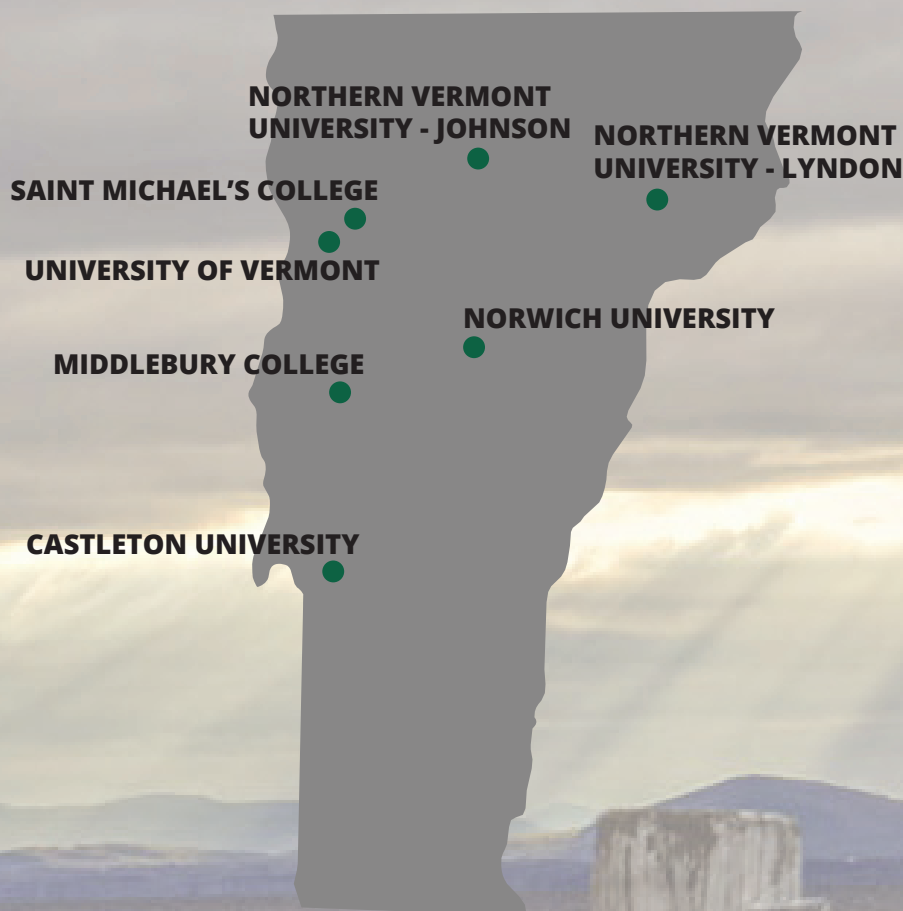
Norwich student  
Dillion Zites with  
Professor Tom Shell  
at the Capitol



# About the Vermont Genetics Network



The Vermont Genetics Network (VGN) is in its third phase of funding with a five-year \$17.8 million award from the IDeA Networks of Biomedical Research Excellence program of the National Institute of General Medical Sciences at the National Institutes of Health. The mission of VGN is to build a culture to promote biomedical research infrastructure in Vermont. At the lead institution, the University of Vermont, we have developed state-of-the-art facilities for Proteomics and Bioinformatics to provide to researchers across Vermont the resources they need to carry out world class research and compete for federal funding. We build cultures of research which foster workforce development, diversity, and the next generation of scientists at our Baccalaureate Partner Institutions: Castleton University, Northern Vermont University (Johnson and Lyndon Campuses), Middlebury College, Norwich University, and Saint Michael's College. We bring state-of-the-art research in college lab classes throughout Vermont, including at the Community College of Vermont and Landmark College.



VGN is funded by the National Institute of General Medical Sciences as part of the **National Institutes of Health initiative IDeA Networks of Biomedical Research Excellence (INBRE)** under award number P20-GM103449.

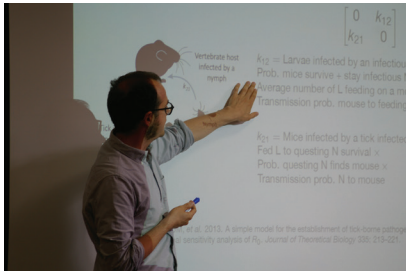
# Disease Ecology Working Group

One of the primary goals of VGN is to build a culture of research across institutions of higher education in the state. A strategy to accomplish this is to create thematic research groups. As VGN's Director, Dr. Rex Forehand, describes, "The major reason for this is that in many of the small institutions that our faculty are from, people don't really have the opportunity to talk with other faculty and other students who have similar research interests. And it may overlap more with somebody from (another Vermont) college than somebody else in their own institution."

As a result, VGN has been sponsoring a Disease Ecology Working Group that four VGN-funded researchers have founded. Professors David Allen (Middlebury College), William Landesman (formerly of Green Mountain College, currently from University of Bridgeport), Dagan Loisel (Saint Michael's College) and Allison Neal (Norwich University) met through VGN's professional development events and saw connections in their research foci and methodologies.

The group has met several times to present their results on topics ranging from Lyme disease to parasites that cause swimmer's itch, and alternates between summer gatherings that include undergraduate student researchers and winter meetings where the faculty discuss methodological challenges and techniques. During the most recent gathering in July 2019 at Middlebury College, researchers from the Vermont Fish and Wildlife Department also participated.

Future plans include expanding the network to include more state agency researchers, but overall, these meetings create a state-wide network of support and potential collaboration.



## Save The Date

**10/11/2019** - VGN Grant Writing Workshop

**04/01/2020** - VGN Career Day

**Find These Stories And More Online**

<https://vgn.uvm.edu/Magazine>



# College Wins NSF Grant of Nearly \$1M for STEM-Data Work

Saint Michael's College leaders have received the largest scholarship grant in the College's history from the National Science Foundation (NSF) to help faculty train more data-savvy scientists and science-savvy mathematicians, statisticians and computer scientists through scholarships, enrichment programs and new curriculum that connects disciplines better.

Nearly \$1 million has been awarded by the NSF to the faculty at the College from the departments of mathematics/statistics, biology, computer science and chemistry to fund a five-year project entitled "Developing a Life Sciences Workforce with Strong Quantitative Skills."

The award establishes Saint Michael's faculty as leaders in recognizing that workers in science fields need better training in the quantitative and computational skills essential to modern data- and modeling-driven life sciences research, say faculty team members, who also have proposed a specific plan to do something meaningful about that need through an innovative college program.

The heart of the grant involves money through the NSF "Scholarships in Science, Technology, Engineering, and Mathematics Program (S-STEM), aimed at "recruiting and supporting 20 highly promising but financially needy students in the life sciences, math, statistics and computer science." Those scholarships, combined with a "focused interdisciplinary curriculum" among those fields at Saint Michael's, "will increase the numbers of students graduating prepared to enter the workforce or doctoral programs with major/minor combinations from the life sciences on one side and from mathematics, statistics, data science, or computer science on the other," says the grant's lead principal investigator, Jo Ellis-Monaghan, chair of the department of mathematics and statistics.

The newly funded work will be under the direction of Ellis-Monaghan (mathematics/statistics) and Greta Pangborn (computer science), Bret R. Findley (chemistry), Declan J. McCabe (biology), Michael Larsen (mathematics and statistics) and Mark Lubkowitz (biology), along with external assessment from Joy Livingston of Vermont-based Flint Springs Associates, a research consultant. Also closely involved in the successful grant application were Saint Michael's Registrar David Barrowclough and Angela Irvine of the Office of Foundation Relation and Sponsored Programs.

Saint Michael's President Lorraine Sterritt, first to receive news of the award in an email from a top NSF grants officer, said, "I am delighted by this news because of the opportunities that it affords academically talented students to study at the highest levels in the STEM fields at Saint Michael's College. It is further evidence that a small college like Saint Michael's is exactly the place to study STEM. Caring and involved professors are walking with students every step of the way."

The researcher-authors for the grant state in their application why they see such work as so important: "One of the most significant positive impacts on society of this program will be developing a Life Sciences workforce with the quantitative and computational skills essential to modern data- and modeling-driven Life Sciences research, which will in turn increase the economic competitiveness of the United States."

Drs. Ellis-Monaghan, Lubkowitz, Findley and McCabe have all received funding from the Vermont Genetics Network.

Story by: Mark Tarnacki

Originally Published:

<https://www.smcvt.edu/news/2018/august/college-wins-major-nsf-grant-for-stem-data-work.aspx>



Former VGN undergraduate research scholar, Shavonna Bent, has been named an awardee of the prestigious 2019 National Science Foundation Graduate Research Fellowship Program (NSF GRFP). Bent is the second VGN alumna from Northern Vermont University (NVU)-Johnson in recent years to receive this honor. Shayna Bennett, now a doctoral student in applied mathematics at the University of California Merced, was an awardee in 2018.

The GRFP is a hallmark of the NSF's overall strategy to develop a globally engaged workforce and supports graduate students with high potential to become leaders in science and engineering research. The program selects 2,000 fellows from over ~12,000 applicants, and provides three years of financial support in the form of an annual stipend and cost-of-education allowance.

Bent, who received funding from VGN to work in Dr. Elizabeth Dolci's laboratory from 2015-2016, graduated from NVU-Johnson in May 2018 with a degree in biology. With this Fellowship, Bent is continuing her dream of becoming a biological oceanographer by pursuing her PhD in Marine Chemistry and Geochemistry through a joint program at the Woods Hole Oceanographic Institution (WHOI) and the Massachusetts Institute of Technology, where she is currently enrolled.

Bent previously conducted summer research at WHOI on the production of the Reactive Oxygen Species superoxide in the Northern Star Coral (*Astrangia poculata*). She initially set her sights on becoming a researcher at the renowned institution when she spotted one of the WHOI research vessels while vacationing with her family in Cape Cod.

## VGN Student Awarded NSF Fellowship



## From Castleton To Panama

### WANTED:

Undergraduate student researchers willing to work in dirty, hot and buggy conditions with long hours and lots of troubleshooting required. The upside? Your office is located in the tropical rainforests of Panama!

When Castleton University Assistant Professor Dr. Christine Palmer was recruiting summer student researchers for her VGN funded project, she emphasized the more demanding aspects of conducting field work to attract intrepid and curious candidates. Luckily, she found rising sophomores Jake Apjohn and Alex Williams who were willing to take on the challenge of working at the Panamanian Smithsonian Tropical Research Institute (STRI) for six weeks.

After an initial training in Vermont with Dr. Palmer, the students were supervised at STRI by two of her collaborators while they sampled neotropical insects, including katydids. Jake and Alex spent their days (and nights) collecting the insects, dissecting their gut contents, and extracting their DNA, all aimed at understanding the relationship between gut microbes and dietary tolerance in these species.

For both Jake and Alex, this was their first research experience. As Palmer describes, "Being able to work at the actual research site is so much more powerful for them. STRI has weekly science talks by experts from around the world and a vibrant culture of researchers on site." Alex, in particular, has "found a new passion for biology" and Jake credits this experience with opening his eyes to "countless future research possibilities."

Both students plan to continue working on this research over the academic year and hopefully over the next few years.







Preston Garcia

## Preston Garcia Earns \$300,

Castleton University Associate Professor of Biology, Dr. Preston Garcia has secured funding for his research until 2021.

The grant, entitled "RUI: Collaborative Research: Understanding the role of a regulating gene expression," is under the direction of Dr. Garcia at Castleton, in

The collaborative grant total amount is for \$560,082, with \$308,011 going to

"Dr. Arango Pindeo and I are excited that our proposal was well reviewed by the United States for this funding validates the hard work we have done to establish experiences as larger research-focused schools. With financial support to pay for in cutting-edge research."

Dr. Garcia's efforts to grow research opportunities at Castleton have impacted the school at Castleton. Most of that money has been awarded by the Vermont Genetics Network for related research. According to Dr. Garcia, this NSF funding would not be possible without the faculty 'graduate' to independent federal funding, which I have now done. I would

Dr. Garcia's research is focused on bacteria, which have the ability to directly observe how changes can be seen visually, the intricate genetic processes that lead to the changes. We carry out these processes using *Sinorhizobium meliloti* as a model. *S. meliloti* provides useable nitrogen to increase crop yield. An efficient and productive genetic systems that control the behavior of this bacterium has the potential to

According to Garcia, "To effectively conduct research across educational institutions, research will help to answer fundamental biological questions about bacterial biology in the agricultural industry."

## VGN Researchers V

### Amanda Crocker Awarded \$340,000 NIH R15 Grant

Middlebury College Assistant Professor of Neuroscience, Dr. Amanda Crocker, was awarded a grant (NIGMS) to fund her research over the next three years.

The grant entitled "Genetic mechanisms of pain integration in the brain to drive avoidance behavior" the project is supported through the NIGMS IDeA Co-funding Initiative.

As Crocker describes, "The grant focuses on understanding what happens at a molecular level. We are particularly interested in the gene expression changes that occur following exposure to stress. This insight into why some people who experience painful stimuli develop post-traumatic stress disorder."

This research builds off of the data that Crocker has collected from her VGN awards over the years. "My most recent [VGN] proposal prior to the submission of this grant was in the restructuring of the grant."

One of the central tenants of the R15 program is to provide undergraduate students with research experience. With anywhere from 4-18 students working in her lab, this grant will contribute to her institution at Middlebury and by providing paid positions, I can provide a lab experience for those students who are unable to do a thesis due to financial commitments."

In addition to funding student researchers in her lab, this multidisciplinary research will also involve Andrea Vaccari and Michael Durst (also a VGN investigator) on various aspects of the project.



# 300,000 NSF Grant

secured a competitive research grant through the National Science Foundation (NSF) which will fund

modified phosphotransferase system and a unique two-component signal transduction system in a collaboration with Dr. Catalina Arango Pinedo at St Joseph's University in Philadelphia, Pa.

Castleton University and \$252,071 going to St. Joseph's University.

by our peers and was awarded funding. Competing with scientists at research schools across the world to establish our science department at Castleton as one that provides students with the same research opportunities as up to 12 Castleton students and six local high school students, we can continue to train students

ed 11 independent research students and resulted in over \$330,000 grant dollars since he arrived at the Vermont Graduate Network (VGN), which provides support for students and faculty members conducting biomedical research. "Without the financial and professional support from VGN. "The goal of VGN is to have research students who could not have had the data or grant writing skills to be competitive for federal funding without VGN."

to sense their environment and change their behavior according to their surroundings. While these mechanisms are not fully understood. This project will investigate some of the ways in which bacteria can sense their environment. It is a member of a larger group of bacteria called rhizobia, and beneficially infects legumes and plants. Rhizobium infection reduces the need for chemical fertilizers. Expanding our knowledge of the mechanisms of rhizobium infection to allow manipulation to optimize the rhizobium-plant interaction.

levels ranging from high school to graduate school is a great opportunity for all involved. Our research, especially how bacteria beneficially infect plants, which has direct impacts on the

Originally Published:

<https://www.castleton.edu/news-media/article/preston-garcia-earns-300000-research-grant/>

## Win National Grants

ed an R15 AREA grant from the National Institute of General Medical Sciences

behavior" totals \$342,519. This was Crocker's first R15 grant submission and

level in the brain, when an animal experiences a physically painful stimulus. to electric shock, noxious heat and mechanical stress." Her research will offer insight into the development of chronic pain disorder as a result.

the last four years. She credits VGN with helping her hone how to pitch her research. "The review of this R15 provided significant comments on the proposal and was beneficial

medical research experiences, which Crocker has done and will continue to do. "The VGN's culture of research. "Many students need a job to be financially sound. Students who may not be able to volunteer, take a semester for credit or write a

give students experience in computer science and physics to work with Drs.



Amanda Crocker





## Norwich University Student Presents Cancer Research in DC

Norwich University student Dillon Zites presented his VGN funded research on improving cancer treatments at the annual Posters on the Hill event in Washington, D.C., on April 30, 2019.

Zites' research presentation titled, "Light Mediated Cancer Treatment Utilizing Cobalamin Derivatives" could lead to more effective ways to target cancer cells with more potent drugs without harming healthy tissue, leading to fewer treatments and side effects during chemotherapy.

Each spring, the Council on Undergraduate Research hosts an annual undergraduate poster session on Capitol Hill. At this event, members of Congress and their staff learn about the importance of undergraduate research through talking directly with the students.

Zites, 20, of Clarksville, North Carolina, is a biology major. He teamed up with his faculty advisor, Dr. Thomas Shell, an assistant professor of organic chemistry, to work on a treatment technique using light waves to activate a vitamin derivative that only targets cancer cells.

For Zites, the search for new cancer treatments is personal, having lost loved ones to the disease, including his grandfather, who died of colon cancer. "I plan to go to medical school and become a doctor. I want to be known as someone who made a difference in multiple people's lives."

**Adapted from article by Stephen Mills at the Barre Montpelier Times Argus. Used with permission.**

## Vermont Researcher Featured in Documentary

Dr. Gina Mireault of Northern Vermont University- Johnson, is featured in the Canadian Broadcasting Company's (CBC) long-running documentary "The Nature of Things". A film crew spent two days with Dr. Mireault and her former undergraduate research assistants, Brady Rainville and Kassandra Cousineau, to recreate the study protocol. This VGN-funded research aired on March 3, 2019 as part of the episode "Laughing and Crying".

(Excerpt pulled from CBC website.)

"The unmistakable sounds of laughing and crying are recognizable all over the world. Yet some researchers say that when it comes to studying human behavior, there's nothing as poorly understood as laughs and tears.

In Vermont, Gina Mireault takes a unique approach to studying laughter, running a very exclusive comedy club ... just for infants! Working with her research assistants, Mireault investigates babies' senses of humor. She believes when a baby laughs and what a baby laughs at can give us tantalizing insight into how developed their brains are."

Mireault's research investigated the early onset and influence of social referencing, the process by which infants come to interpret the emotional nature of events, and which is the cornerstone of infant social-emotional development in the first year. Her research has found that infants independently interpret ambiguous, incongruous social events as humorous beginning at five months of age, revealing their early sophistication regarding social behavior.

These results have important implications for identifying early markers of developmental disorders.

After being funded by VGN, Dr. Mireault was awarded an NIH R15 AREA grant from 2012-2015 to continue this line of research.







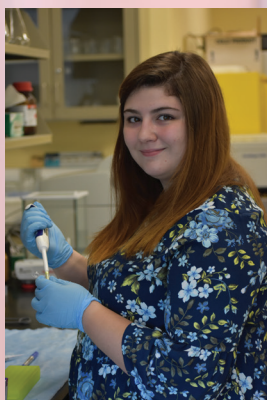
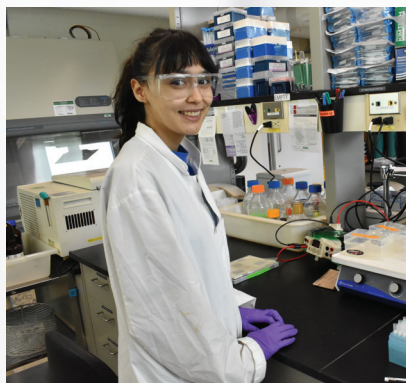
# VGN Summer Interns Find Opportunities in Vermont

In addition to the student researchers working in the funded faculty laboratories over the summer and academic year, VGN offers a unique opportunity for undergraduates to gain research experience outside of their home institution. Through VGN's partnerships, we have provided Vermont students and those from underrepresented groups with research experiences at the Albany College of Pharmacy and Health Sciences (ACPHS), Delaware State University (DSU, a historically black university), the White River Junction Veterans Affairs Medical Center and Bia Diagnostics, LLC. In 2018, VGN placed 14 students, including five from historically black colleges and universities, and in 2019, 10 undergraduate researchers were accepted. These cohorts include students from our in-state outreach partners, Landmark College and the Community College of Vermont.

Among those in 2018 was Sabrina Hardy from Northern Vermont University- Lyndon who worked at ACPHS in Dr. Yana Cen's lab. Sabrina, who grew up in Milton, VT, was considering applying to pharmacy school before this research experience. At the end of the summer, however, she knew this was the career path for her. "This is definitely the best professional decision I've made in my life," she said of participating in the VGN program. Sabrina has since applied for and is currently enrolled in ACPHS's Doctor of Pharmacy program to pursue her dream of becoming a pharmacist.

VGN is especially proud of its connection to DSU, a member of the Delaware INBRE network, in which we exchange two students every summer. As a result, our Vermont students learn advanced laboratory experiences in another state, and VGN benefits by hosting diverse and highly skilled undergraduate scholars at the University of Vermont.

The overall success of this program is evident in the number of students who have maintained connections to their labs, and is exemplified by the two student co-authored publications from 2018's cohort. VGN is excited to continue offering these opportunities and looks forward to expanding our partnerships to more industry and state agencies.





## VGN PROTEOMICS CORE

Under the direction of Drs. Wai Lam and Bin Deng, VGN's Proteomics Facility has been providing cutting-edge proteomics expertise to the network since 2006. Highlights from their work over the past year include:

- Supported more than 15 NIH and NSF grants from network investigators, including two awarded to VGN funded faculty
- Provided data that resulted in over 10 peer-reviewed publications, including in *The FASEB Journal* and *Nature Communications*
- Supported undergraduate research initiatives across Vermont's institutions of higher education by offering facility tours, free sample analysis and curriculum development

### Facility Updates:

The facility's mass spectrometers (MS) are state-of-the-art. In addition to the Q Exactive and Q Exactive Plus machines that were installed in 2015 and 2017, respectively. In 2018 the facility revitalized its linear ion trap MS. Now it is capable of performing electron transfer dissociation (ETD) and hydrogen/deuterium exchange (HDX) MS experiments. With these updates, the facility can help researchers:

- Efficiently and comprehensively analyze post-translational modifications and disulfide bond linkages (with ETD; pictured left) and
- Investigate protein structures and dynamics (with HDX; pictured right).



Wai Lam, PhD



Bin Deng, PhD



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## VGN BIOINFORMATICS CORE



Fan Zhang, PhD



Heather Driscoll

Led by Director, Dr. Fan Zhang, and Bioinformatics Analyst, Heather Driscoll, the VGN Bioinformatics Core team has over 30 combined years of experience to assist network investigators with their biological information data analysis needs. Highlights from their work include:

- The acquisition of a new Partek software package to analyze ChIP-Seq studies to enhance the Core's genomic analysis capabilities.
- An expansion of the Core's de novo transcriptome assembly services by the addition of a de novo RNA-Seq assembly pipeline using Trinity and edgeR software packages.
- A new collaboration with Dr. Amanda Crocker from Middlebury College to assist her in building gene network models using genomic mapping techniques.
- A new collaboration with Dr. Stephanie Pero from the University of Vermont on her breast cancer research that involves generating phylogenetic trees from somatic hypermutation data.
- A new collaboration with Dr. Cassidy Shaw from the VT Fish and Wildlife Department for her project on the de novo assembly of melanoma in catfish.
- A joint collaboration with Dr. Ruth Fabian-Fine from Saint Michael's College, the VGN Proteomics Core, and the New Hampshire INBRE Bioinformatics Core on genome sequencing and customized protein database building for the Central American wandering spider.



# FROM THE DIRECTOR



As this is my first newsletter, I wanted to express my appreciation to all the wonderful VGN staff members and our BPI Coordinators, faculty, and undergraduates. We truly have an outstanding organization, which is the product of our previous Director, Dr. Judith Van Houten, and all of the many people who have worked so hard to make VGN successful. Beyond our staff and BPI affiliates, the Vice President for Research at the University of Vermont, Dr. Richard Galbraith, his Director of Operations, Dan Harvey, and UVM's Sponsored Project Administration office (especially Deb Cannon) have all contributed to our success through their patience, advice, and monetary investment. Finally, the National Institute of General Medical Sciences, and particularly Program Directors Krishan Arora and Irina Krasnova, has provided incredible financial support and wise guidance. It has "taken a village" to make VGN a unit which has improved the infrastructure of research across the state of Vermont during the past 18 years!

VGN is posed to begin a new five year grant cycle in June 2020. There will be many changes coming down the road as VGN continues to move forward in enhancing the culture of research in our beautiful state. I firmly believe our successes will multiply as we move forward. We welcome all who want to be a part of this exciting time.

A handwritten signature in black ink that reads "Rex L Forehand".

**Rex Forehand, PhD**  
Director, Vermont Genetics Network  
University of Vermont

## VGN HIGHLIGHTS

Norwich University student, **JOSHUA SASSI**, presented his research with **DR. ALLISON NEAL** at the 2018 Posters on the Hill in Washington, DC

**DR. DAVID ALLEN** from Middlebury College received the 2018 Monique and Lester Anderson Endowment for Biosphere Studies Award

**DR. JO ELLIS-MONAGHAN** from Saint Michael's College is the Fall 2019 Eugene P. Shelly visiting professor at Carnegie Mellon University, and will be the Fulbright Distinguished Chair at Charles University in Prague in Spring 2020

**DR. LESLEY-ANN GIDDINGS** from Middlebury College presented her research on cryptic metabolites from Antarctic *Marinobacter* at the Polar Conference in Davos, Switzerland

Middlebury College's **DR. MICHAEL DURST'S** publication with three student co-authors in Applied Optics was highlighted as an Editor's Pick in January 2019

**DR. PRESTON GARCIA** from Castleton University was awarded the Richardson Faculty Award, which is given out only once every three years

**DR. RUTH FABIAN-FINE** from Saint Michael's College published the paper "Distribution of FMRamide-related peptides and co-localization with glutamate in *Cupiennius salei*, an invertebrate model system" in Cell and Tissue Research with seven undergraduate student co-authors

**DR. JOE LATULIPPE** from Norwich University presented his research on the mathematical modeling of Alzheimer's disease at the Society for Mathematical Biology meeting in Sydney, Australia

Northern Vermont University- Johnson graduate, **SIERRA SOLNICK**, will begin the Doctorate of Naturopathic Medicine and Masters of Integrative Medicine Research Program at the National University of Natural Medicine in Portland, OR

**DR. ROBERT MOELLER** from Middlebury College presented his research on college student's mental health at the International Convention of Psychological Sciences in Paris, France



Vermont Genetics Network  
University of Vermont  
120A Marsh Life Science Building  
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Vermont  
Genetics  
Network

#### Photo Credits:

**Johnathan Kemp** - Test tubes  
"Amanda Crocker Awarded \$340,000  
NIH R15 Grant" pg 6-7

**Alex Williams** - Forest (background)  
"From Castleton To Panama" pg 5

**Jake Apjohn** - Panama Features  
"From Castleton To Panama" pg 5

**Don Hamerman** - St. Michael's Dion  
Family Student Center "College Wins  
NSF Grant of Nearly \$1M for STEM-  
Data Work" pg 4

**Kenneth Kostel** - Shavonna  
Bent "VGN Student Awarded NSF  
Fellowship" pg 3

## TITLES OF OUR CURRENT FACULTY FUNDED RESEARCH

**David Allen, PhD - Middlebury College** "OspC Type and Tick Seasonality's Effect on Virulence of Lyme Disease Agent"

**Amanda Crocker, PhD - Middlebury College** "Genetics of Stress and Traumatic Brain Injury"

**Michael Durst, PhD - Middlebury College** "Scanless Volumetric Temporal Focusing Microscopy"

**Erin Eggleston, PhD - Middlebury College** "Investigating the Role of Cyanophage in Cyanobacterial Harmful Algal Blooms"

**Greg Engel, PhD - Castleton University** "The Role of Neuropeptide-like Precursor 3 in Olfactory Conditioning"

**Ruth Fabian-Fine, PhD - Saint Michael's College** "Efferent Innervation of Sensory Neurons in an Invertebrate Model System"

**Lesley-Ann Giddings, PhD - Middlebury College**  
"Structural & Kinetic Characterization of Putative DesB, an N-hydroxylase"

**Michael Linderman, PhD - Middlebury College** "Non-parametric Genotyping of Structural Variants in Whole Genome Sequencing Data"

**Robert Moeller, PhD - Middlebury College** "College Student Mental Health Pathways Wave 2"

**Allison Neal, PhD - Norwich University** "Division of Labor in Freshwater Trematodes: The Host Longevity Hypothesis"

**Christine Palmer, PhD - Castleton University** "Diet Specialization and Gut Microbiota in Neotropical Katydid"

**Lindsay Repka, PhD - Middlebury College** "Development of Photoredox Crosslinking Approach to Target Identification"

**Thomas Shell, PhD - Norwich University** "Development of Photopharmaceuticals to Treat Head and Neck Cancers"

The VGN links resources at the University of Vermont to its partner institutions, which include:

Castleton University  
Northern Vermont University - Lyndon  
Northern Vermont University - Johnson  
Middlebury College

Norwich University  
Saint Michael's College  
Community College of Vermont\*  
Landmark College\*

NIH reminds us that "IDeA Investigators being funded through one of the IDeA initiatives are expected to apply for and receive independent research funding." VGN's mission is to provide the resources for researchers in our partner institutions to develop their research and submit competitive proposals to support their research into the future.

\* Outreach Partners