2022 RESEARCH LOCATION DESCRIPTIONS

Bia Diagnostics (Colchester, VT)- One position open to CCV and BPI students
http://www.biadiagnostics.com/

Bia Diagnostics, an ISO 17025 accredited laboratory, is a world leader in food allergen analysis. In this internship, the student will gain experience working in a fast-paced contract testing laboratory, assisting in processing samples and lab cleaning, while also learning the science behind ELISA and PCR based food testing methodology. During the course of this internship the student will be expected to complete a research project that demonstrates practical hands-on knowledge of these technologies, for example by validating a test kit to industry standards or by testing a variety of store-bought foods for unlabeled allergens or GMOs.

Vernal Biosciences (Colchester, VT)- Two positions open to CCV and BPI students
https://www.vernal.bio/

Vernal Biosciences manufactures high purity mRNA for R&D needs that range from concept to clinical. The successful intern will be a motivated self-starter who takes initiative, asks questions, seeks answers, and can make headway at the lab bench. Experience running common protein-, DNA- or RNA- based production procedures, purification and quantitative/qualitative assays is a plus.

Responsibilities may include but are not limited to: bacterial transformation & scale up, plasmid prep & development, in vitro transcription, RNA capping, DNA/RNA agarose gel image analysis, Western blot, and RNA purification. This is an opportunity to become part of Vermont's burgeoning Biotech scene while learning worthwhile skills in a small team environment!

Delaware State University (Dover, DE)- Two positions open to BPI students

As part of an agreement between VBRN and DSU, we exchange students via our summer undergraduate research programs. The DSU program description and FAQs can be found here: http://de-inbre.org/dissp-faq/.

After students have submitted their application to VBRN and are selected for this opportunity, they will be directed to submit their materials a second time through DSU's application site. At that point, students will be asked to list their top 3 mentor choices. Mentor research descriptions can be found here: http://de-inbre.org/mentor-search/

Dr. Josh Bongard lab (UVM)- One position open to Champlain College students
Department of Computer Science
https://jbongard.github.io/

The Bongard Lab works to create autonomous robots that can perform a variety of useful tasks, safely. Current research is focused on building robots from soft- and/or biological materials. Students working in the lab are expected to have programming experience in Python, and they should be willing to learn other programming languages and software frameworks. Depending on the project, students work with AI methods, physics engines, supercomputers, biological models, human computer interaction interfaces, and physical robots.

Dr. Jason Botten lab (UVM)- One position open to Delaware Statue University students
Department of Medicine
https://www.med.uvm.edu/medicine/immunobiology/bottenlab

The Botten lab studies host-pathogen interactions among pathogenic RNA viruses (e.g. arenaviruses, hantaviruses, coronaviruses, and flaviviruses) and their incidental human hosts and natural animal or insect reservoirs. His program focuses on the discovery of key virus-host interactions that can be targeted for the development of therapeutics and vaccines as well as defining the natural history of the human T and B lymphocyte responses to these pathogens and determining their contribution to protective immunity and/or immunopathologic disease. Dr. Botten has assembled an international multidisciplinary team of top industry

and government partners, as well as clinicians and basic researchers, to facilitate basic science discoveries that can be translated into novel antivirals or vaccines. He would welcome a VBRN student to join the team this summer!

Dr. Frances Carr lab (UVM)- One position open to Landmark College students
Department of Pharmacology
https://www.med.uvm.edu/pharmacology/carrlab

Endocrine cancers continue to be a public health concern. Thyroid cancer is the fastest growing cancer world-wide with obesity, lifestyle, environmental toxins as likely contributing factors. As with other endocrine cancers, treatments for patients are complicated when resistance to therapies and recurrent disease emerge and in aggressive disease interventions are limited. Using advanced molecular, sequencing, and bioinformatic approaches, the current research in the Carr laboratory is focused on understanding the genomic and epigenomic mechanisms by which a hormone receptor normally associated with development (thyroid hormone receptor-TRβ) can block thyroid and breast tumor growth. The research group is also defining how activation of TRβ with drugs, currently used for treatment of metabolic diseases, improves the response of the tumors to known treatments of thyroid and breast cancers and limits the development of resistance. These studies aim to mitigate the development of treatment-resistant and/or recurrent disease and provide novel therapeutic interventions.

Dr. Carr's experience at the interface of basic and clinical research are central to her research program. She has established diverse research partnerships encompassing the fields of Geographic Information System (GIS) mapping and spatial analysis, epidemiology, bioinformatics as well as fundamental and translational cancer biology. The breadth of these collaborative endeavors ensure that her students have opportunities to learn from experts in diverse fields including metabolism, bioinformatics, in vivo models, translational and clinical studies and experience in team-based science.

Dr. Kelly Peck lab (UVM)- One position open to CCV and BPI students
Department of Psychological Science
https://www.uvm.edu/cas/psychology/profiles/kelly-peck

My research interests are two-fold. I have conducted research focused on the development and evaluation of novel treatments for opioid misuse and use disorder. Most recently, this has included work on two randomized clinical trials evaluating a novel interim buprenorphine treatment for reducing illicit opioid use and other high-risk behaviors among adults with untreated opioid use disorder. I also have a research interest focused on the delivery and evaluation of cognitive-behavioral treatments for posttraumatic stress disorder in individuals with concurrent substance use disorders. I am currently preparing to integrate these two areas of research as I direct a study investigating the contribution of prolonged exposure therapy, an efficacious manualized cognitive-behavioral treatment for posttraumatic stress disorder, above and beyond opioid agonist treatment alone for reducing posttraumatic stress disorder symptoms among patients with concurrent posttraumatic stress disorder and opioid use disorder.

Dr. Markus Thali lab (UVM)- One position open to Delaware Statue University students
Department of Microbiology and Molecular Genetics
https://www.med.uvm.edu/mmg/faculty/markus-thali-ph-d

Though the retrovirus HIV-1 is the main subject of our studies, we have also started investigating how the envelope glycoprotein of an endogenous retrovirus is involved in the formation of human placentas.

While we use various virological and cell biological techniques for our investigations, particular emphasis is being placed on applying quantitative imaging methods. These include restoration fluorescence microscopy and super resolution microscopy for analyses of subcellular events and light sheet microscopy for analyses at the cell population level (with single cell resolution). Using such methods, combined with computational analyses of images and movies, we recently found that HIV-induced small T lymphocyte syncytia are a subpopulation of infected cells that have distinct surface protein profiles as well as migratory properties that distinguish them from infected mononucleated T cells. A major thrust of our current work thus aims at understanding what role this subpopulation of HIV-1-infected cells plays in virus spread.