

VERMONT GENETICS NETWORK (VGN)
UNDERGRADUATE STUDENT SUMMER RESEARCH SUPPORT 2020

INTERNSHIP LOCATION DESCRIPTIONS

Albany College of Pharmacy and Health Sciences (Colchester, VT)

Dr. Karen Glass' Lab (<https://www.acphs.edu/glass-lab>)

The human genome is compacted into chromatin, allowing nearly three meters of DNA to fit into the small volume of the nucleus. Chromatin is composed of DNA and proteins, and this DNA-protein complex is the template for a number of essential cell processes including transcription and replication. Understanding the role of chromatin's higher order structure in transcriptional control is important as loss of this regulation underlies many disease processes.

My research program examines how modifications on the nucleosome work as a code to regulate chromatin structure, and also to recruit proteins essential for the regulation of diverse cellular process including cellular proliferation, differentiation, gene transcription, and DNA replication and repair. High field Nuclear Magnetic Resonance (NMR) spectroscopy, X-ray crystallography, and biochemical and molecular biology approaches are utilized determine the three-dimensional structures and functions of chromatin binding proteins implicated in many diseases including cancer, cardiovascular disease, neurological disorders and even parasitic infections.

Bia Diagnostics (Colchester, VT)

<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.

Delaware State University (Dover, DE)

As part of an agreement between VGN 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 VGN 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/>

White River Junction Veterans Affairs Medical Center (White River Junction, VT)

<https://www.whiteriver.va.gov/>

We have several basic laboratory science investigators studying a wide range of areas in hopes of providing insights into new therapies and treatments for veterans and others. A few areas of basic laboratory research include: targeted therapies to reduce inflammation and improve neuropsychiatric symptoms associated with Traumatic Brain Injuries (TBI); endocytosis in *Candida* filamentation, biofilm formation and virulence; therapeutic implementation of new CRISPR/Cas gene editing system for targeting and destroying genes that cause disease. We have a Veterinary Medical Unit that houses rodents for the use in research. We are fully accredited by AAALAC and have a functioning Institutional Animal Care and Use Committee (IACUC).

We have approximately 42 active investigators with approximately 100 active human subjects research which encompasses the fields of Oncology, Cardiology, GI, Mental Health, Nephrology and Rheumatology. We also do a variety of health policy research, clinical epidemiology, research on the development of informed decision making instruments, and research that specifically targets rural patients (to improve their health care delivery). We are closely aligned with both the University of Vermont and Dartmouth's Geisel Medical School.

We are fortunate to host two national programs at our facility. The National Center for PTSD and the National Center for Patient Safety both do an incredible amount of research in the area.