1. ACS Nuclear & Radiochemistry Summer School.
   *San Jose State University, San Jose, California, and Brookhaven National Laboratory, Upton, New York*
   This is a competitive fellowship program that consists of lecture and laboratory components. It covers the fundamentals of nuclear theory, radiochemistry, nuclear instrumentation, radiological safety, and applications to related fields. Laboratory work will introduce the midshipman to state-of-the-art instrumentation and technology that are used routinely in basic and applied nuclear science. In addition, there are special symposia, guest lectures, and field trips to nearby research centers. This internship helps prepare USNA graduates for service in the nuclear communities.
   [https://chemistry.missouri.edu/nucsummer](https://chemistry.missouri.edu/nucsummer)
   - Dates: 16 June – 27 July 2019
   - Eligible for PTE credit: no (because it is a school)
   - Qualifications: rising 1/C or 2/C, 2 years of chemistry, 1 year of physics, 1 year of calculus
   - Funding: See POC
   - Application: (1) See website above; deadline 1 February 2019. (2) Also, submit chemistry application. **Note:** See the POC asap before applying.
   - POC: Prof McClean mcclean@usna.edu

2. **Armed Forces Radiobiology Research Institute (AFRRI), Bethesda, Maryland.**
   **Radiobiology Research**
   Midshipmen will work with military and federal civilian scientists on projects related to AFRRI’s research portfolio in radiation biology, which includes biochemical and physiologic mechanisms, countermeasure development, radiation injury/dose assessment and prognostication, the effects of combined injury involving radiation, and delayed or late effects such as fibrosis and cancer. Specifics of each project will be determined after interaction between intern and mentor.
   [https://www.usuhs.edu/afrr](https://www.usuhs.edu/afrr)
   - Dates: Block 1, 2, or 3.
   - Eligible for PTE credit: yes
   - Qualifications: 1 year of chemistry. 1 semester of biology desired.
   - Funding: reimbursement for daily commutes from USNA.
   - Application: Submit chemistry application to POC.
   - Other: Midn must commute daily from USNA.
   - POC: Prof McClean mcclean@usna.edu

3. **The Baruch S. Blumberg Institute, Buck County, Pennsylvania.**
   **Hep B Research**
   The Baruch S. Blumberg Institute is a leading nonprofit research organization dedicated to hepatitis B and liver cancer. A variety of research projects that center around hepatitis and virus research are available. Selected examples are (1) Early Detection of Disease. (2) Experimental Therapeutics. (3) Molecular Pathogenesis. [http://blumberginstitute.org/](http://blumberginstitute.org/)
   - Dates: Block 1.
   - Eligible for PTE credit: yes
   - Qualifications: rising 1/C or 2/C. Chemistry major or biology background.
   - Funding: fully funded.
   - Application: Submit chemistry application to POC.
   - POC: Prof McClean mcclean@usna.edu

4. **The Bureau of Public Health Laboratories-Miami, Miami, Florida.**
   **Infectious Organisms Research**
   The Bureau of Public Health Laboratories (BPHL) – Miami is one of 3 state reference laboratories in Florida. It provides testing to private sector laboratories for rare and unusual infectious organisms. BPHL - Miami also confirm the findings of a private laboratory or perform additional high complexity tests for diseases of public health importance. BPHL also belongs to the National Laboratory Response Network for Bioterrorism (LRN-B). A midshipman participating in this internship will learn the role of public health departments in anticipating, detecting, and mitigating dangers to the health and safety of citizens. Because of its location in a major American city with a large international port and population, the participants will learn about the challenges involved in working with diverse and dynamic public health situations, including detection of bioterrorism agents.
   - Dates: Block 1.
   - Eligible for PTE credit: yes
   - Qualifications: rising 1/C, 2/C, or 3/C. Completion of 1 semester of biology is helpful.
   - Funding: fully funded.
   - Application: Submit chemistry application to POC.
   - POC: Prof Smith vsmith@usna.edu

5. **Defense Forensic Science Center (DFSC), Forest Park, Georgia.**
   **Forensic Science**
   Interns perform hands-on research and learn about various disciplines of forensic investigation. At the end of the program, Interns present their data to the Director of the Laboratory, the Chief Scientists, Branch Chiefs and other laboratory personnel. Due to the nature of the laboratory and the various areas of forensic analysis performed, the research conducted at this laboratory can vary significantly. However, recent and current projects include: Gunshot residue analysis, Spice detection, explosives testing and detection, DNA mixture separations, and latent fingerprint lifting from mixed surfaces. Some projects are chemistry related while others are math and engineering related.
   - Dates: All blocks available. Block 0 + 1 preferred.
   - Eligible for PTE credit: yes
   - Qualifications: rising 1/C or 2/C, Chem or STEM major.
   - Funding: fully funded.

(These descriptions are for “chemistry” internships. For “medical” internships, see end of this document for information. To apply, follow instructions on the last page.)

29 November 2018
6. National Human Genome Research Institute (NHGRI), Bethesda, Maryland. 

**Human Genome Research**

Midshipmen will work with civilian scientists and clinicians on research projects that center around genetics and genomics. They will assist the scientists in carrying out experiments that are aimed at developing better approaches for detecting, diagnosing, and managing genetic disorders. Possible specific research areas are: a study of genetic changes that lead to the initiation and progression of cancer; the identification of genetic abnormalities responsible for human disease; the use of molecular genetics to identify disease-associated gene defects.

[http://www.genome.gov/10000218](http://www.genome.gov/10000218)

- Dates: Block 0 + 1 (or by arrangement for 6 weeks).
- Eligible for PTE credit: yes
- Qualifications: Any class. Chemistry major.
- Funding: not funded.
- Application: (1) See website above; deadline 1 March 2019. (2) Also, submit chemistry application. **Note:** See the POC asap before applying.
- Other: Midn must commute daily from USNA.
- POC: Prof McClean [mcclean@usna.edu](mailto:mcclean@usna.edu)

7. Naval Research Laboratory, Washington, D.C. 

**Biochemical Aspects of Barnacle Glue**

Hard fouling organisms such as barnacles stick to ship hulls and significantly impede maritime operations, costing the U.S. Navy millions of dollars per year in coating, cleaning and added fuel costs. Such a tenacious underwater bond relies on specialized proteins that form an adhesive for permanent attachment of their hard outer shells to surfaces. NRL’s Chemistry and BioMolecular Science Divisions are applying cutting-edge biomolecular and bioinformatic approaches to produce a new, more comprehensive picture of the specialized proteins found in barnacle adhesive. Midshipmen will investigate the biochemical aspects of barnacle glue, which will involve the development and application of colorimetric/fluorometric assays that are sensitive to the molecular structure of the glue. These assays will also be used to understand the properties of proteins designed to mimic barnacle glue. Projects will involve training/development in standard methods of molecular biology, such as gel-based techniques to characterize proteins (gel electrophoresis, Western Blotting, fluorescence staining) and quantitative polymerase chain reaction (qPCR) to measure the abundance of mRNA in barnacle tissues.


- Dates: Block 2
- Eligible for PTE credit: yes
- Qualifications: rising 1/C or 2/C, chemistry, physics, and biochemistry courses. Helpful if applicant has completed biology courses.
- Funding: reimbursement for daily commutes from USNA.
- Application: Submit chemistry application to POC.
- Other: Midn must commute daily from USNA.
- POC: Prof Yates [eyates@usna.edu](mailto:eyates@usna.edu)

8. Naval Research Laboratory, Washington, D.C. 

**Genetically Engineered Materials**

Participants in the synthetic biology internship at the Naval Research Lab in Washington, DC, will create living sensors to protect Navy divers and submariners from toxic chemicals. Interns will work side-by-side with NRL biologists as a team and compete at the International competition of Genetically Engineered Machines (iGEM) in Boston in October 2019, against other undergraduate institutions, including the Air Force Academy and West Point. Interns will gain wet lab experience and basic skills in microbiology and molecular genetics to create bacterial cells that glow when exposed to toxic chemicals. By the end of the internship midshipmen will have experience designing PCR reactions, cloning DNA, and transforming bacterial cells with new DNA. They will also gain fundamental understanding of the field of synthetic biology.


- Dates: Block 1, 2, or 3.
- Eligible for PTE credit: yes
- Qualifications: rising 1/C, 2/C, or 3/C. Any major. Helpful if applicant has completed some biology or biochemistry courses.
- Funding: reimbursement for daily commutes from USNA.
- Application: Submit chemistry application to POC.
- Other: Midn must commute daily from USNA.
- POC: CAPT Kennedy [lkennedy@usna.edu](mailto:lkennedy@usna.edu)

9. Naval Surface Warfare Center - Indian Head EOD Technology Division (NSWC IHEODTC), Indian Head, Maryland.

**Energetic Materials Research**

NSWC IHEODTD is the Department of Defense (DoD) Energetics Center and serves as the DoD Explosive Ordnance Disposal Technology Program. Internship projects center around the following: (1) lab work on propellants. (2) propellant testing (including field testing). (3) explosive manufacturing research. (4) robotics support & explosive detection equipment. (5) work on warhead designs, fuzing efforts, and lethality studies (to include modeling and simulation studies). Midshipmen will be matched to projects, based on their majors.


- Dates: Block 1, 2, or 3.
- Eligible for PTE credit: yes
- Qualifications: rising 1/C or 2/C, chemistry, physics, and electrical & mechanical engineering majors.
- Funding: lodging & meals provided at NSWC-Indian Head.
- Application: Submit chemistry application to POC.
- POC: Prof McClean [mcclean@usna.edu](mailto:mcclean@usna.edu)

10. Vanderbilt University, Nashville, Tennessee.

**Multianalyte Microphysiometry Methods**

This internship will involve research with the Cliffel lab, which is developing new multianalyte microphysiometry methods with applications in cancer, diabetes, and toxicology. This is done through electrochemical detectors for many metabolic analytes into the microfluidic chamber to give a complete dynamical picture of the live cell
population. Work is always progressing, but recent projects included glucose, choline, and glutamine detection. The midshipman will work on either fabricating devices or testing detection capabilities.

http://www.vanderbilt.edu/chemistry/faculty/cliffel.php

- Dates: Block 1 and Block 2 are available. Block 0 + 1 is preferred.
- Eligible for PTE credit: yes
- Qualifications: Completion of SC261 & SC262. Completion of SC361 & SC364 is desired.
- Funding: fully funded.
- Application: Submit chemistry application to POC.
- POC: CDR Spencer jaspence@usna.edu

Medical Internships

The Chemistry Department also sponsors medical internships. Information can be found on the Chemistry Department Internship Webpage.

Chemistry Department Internship Website

Other Internships

Visit the USNA Internship website: https://intranet.usna.edu/AcResearch/USNA-Approved-internships.php

To Apply

Download the PDF application from http://www.usna.edu/ChemDept/ChemMajor/internships.php, complete and save it in the original PDF form, and forward it to the POC(s) of the chemistry internship(s) you are interested in. Note: Only one application needs to be completed for all the chemistry internships. Submit the same application to all the POCs for chemistry internships you are interested in. If additional information is needed on an internship, contact the POC for that internship.

Chemistry Department Internship POC:
Prof McClean (mcclean@usna.edu)