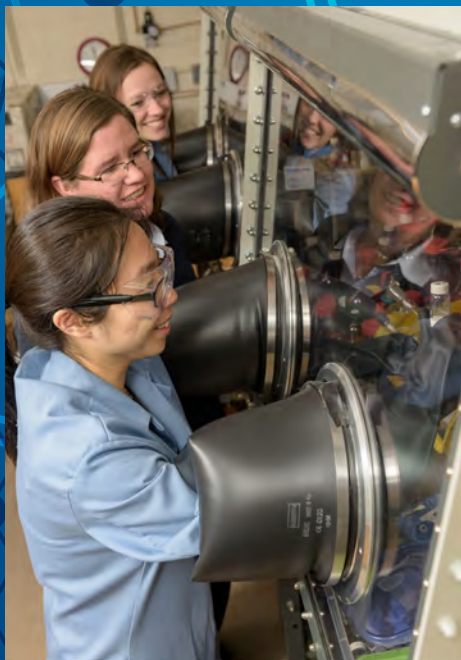
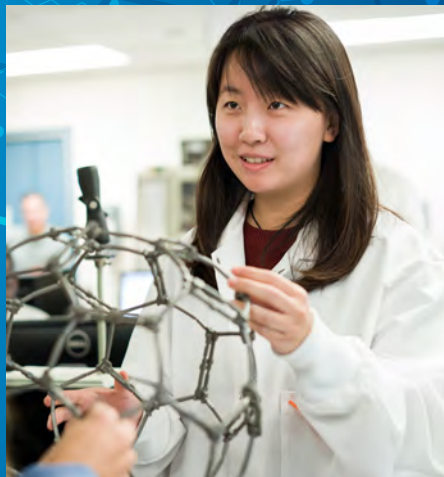


Chemistry AND Biochemistry





The Department of **Chemistry and Biochemistry** at the **University of Delaware** has been a historical leader in the molecular sciences and our rich traditions are highlighted by the award of the Nobel Prize in Chemistry in 2010 to Prof. Richard F. Heck, a longtime member of our faculty. Our department has continued to build upon this legacy, having assembled a dynamic and energetic faculty working in the cutting-edge of chemical research.

As a measure of our current strength, research expenditures within our department are approaching \$10

million annually, with more than 180 full-time PhD students pursuing degrees in our program. We believe our department offers many advantages to students looking to pursue advanced studies in the chemical sciences.

Research Areas

Our department offers opportunities for PhDs in a range of traditional research areas including **analytical, inorganic, organic, and physical** chemistry, as well as **biochemistry**. Within these areas, we place major emphasis on **collaborative** and **interdisciplinary** inquiry.

Research focus areas within our department include:

- » Asymmetric and transition metal catalysis
- » Biological and inorganic materials chemistry
- » Chemical biology
- » Energy and environmental sciences
- » Electrochemistry and photochemistry
- » Experimental and computational enzymology and biophysics
- » Organic and inorganic synthesis

- » Spectroscopy and imaging
- » Surface and interface sciences

Our Faculty

The cornerstone of our department is our dynamic faculty. We are home to more than 27 research active faculty members working across chemistry and biochemistry. In addition to the Nobel Prize, our faculty have received numerous awards in recent years. These include:

“The friendly, open atmosphere really encourages interdisciplinary collaborations, ultimately benefiting everyone in the research community.”

—Amy Schaefer, PhD Student





“The facilities staff are exceptional at their jobs and keep the department running, allowing graduate students to focus more on their research.”

—*Andrew Cinderella,
PhD Student*

- » Multiple AAAS Fellows
- » Multiple Alfred P. Sloan Research Fellows
- » Camille Dreyfus Teacher-Scholar Awards
- » Multiple Cottrell Scholar Awards, Research Corporation
- » DuPont Young Professor Awards
- » Over 10 NSF CAREER Awards
- » NSF Presidential Young Investigators

- » Pew Scholar in the Biomedical Sciences

Our Facilities

Critical to the success of the modern research is access to advanced instrumentation. Our department occupies more than 200,000 square feet of laboratory and classroom space. In addition, we host an impressive range of instrumental facilities that support our research effort. Our facilities include expertly staffed:

Magnetic Resonance Laboratories

with more than eight high-field NMRs ranging from 400 to 850 MHz. These instruments are equipped with a



“The faculty at UD was pivotal to my success. Beyond their knowledge and expertise, their passion and relentless pursuit of the scientific unknown is contagious... I couldn't feel more prepared for the road ahead than I do right now having earned my doctorate from UD.”

—*Rob Panish, UD PhD (2015)*

range of capabilities, including auto sampling and cryogenic probes, and supporting a broad range of nuclei for analysis in solution and solid state. The facility also supports EPR capabilities.

Mass Spectrometry

Laboratory with a range of modern mass spectrometers capable of both routine and high-resolution analysis of samples ranging from air-sensitive organometallic complexes to large biomolecules.

Crystallography

Laboratories housing advanced X-ray diffractometers equipped with dual wavelength, bright X-ray sources. In addition, the department also houses powder diffraction and

biological X-ray diffractometers, allowing characterization of samples ranging from small molecules and inorganic materials, to peptides and whole proteins.

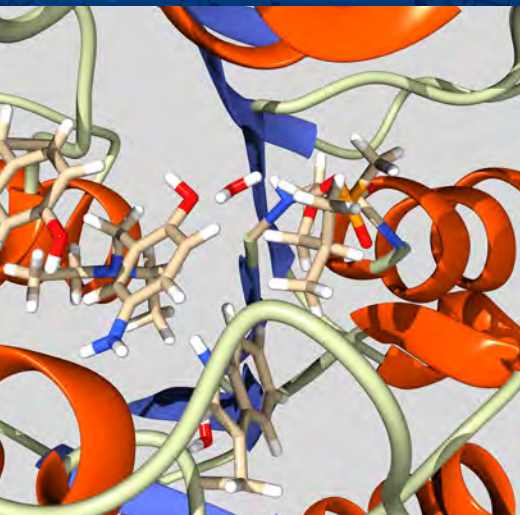
Surface Analysis Facility

with a full range of surface analytical techniques, including start-of-the-art TOF-SIMS and XPS instrumentation.

Computational Facilities

housing over 3600 CPU cores, 43,000 GPU cores, 8.1 terabytes of RAM, and 1.1 petabyte of storage across a dozen clusters connected by 10 Gb and 40 Gb high speed ethernet interconnects. In addition, the a full time computational scientist staff supports computational investigations within the department.





“The Chemical and Biology Interface program at UD allowed me to explore different aspects of research while still focusing on my concentration.”

—Emily Berkman, PhD student

◀ *Evaluating a new mechanism for acetylcholinesterase reactivation. Reaction of acetylcholinesterase by a drug candidate.*

In addition, our department has fully staffed glass blowing, machining, and electronics shops, as well as access to state-of-the-art campus facilities for advanced microscopy, materials characterization, bioimaging, genome sequencing, proteomics, magnetic resonance imaging, and animal research, making the resources and support available to support any research effort.

Research & Training Centers

Three NIH supported centers are housed within our department:

We host a **NIH Chemical and Biology Interface (CBI)** training program that brings together researchers from across campus working at the interface of

chemistry and biology. This center also provides unique training opportunities for student interested in working within this important arena, including two years of fellowship support.

Two NIH Centers for Biomedical Research Excellence (COBREs)

are also housed within the department. These centers are focused on the **development and study of novel biomaterials**, and on the **development of new therapeutic leads and molecular probes** for the treatment of human disease, respectively. Total funding for these two centers currently exceeds \$15 million dollars, which provides significant research support and infrastructure for investigations in these critical areas.



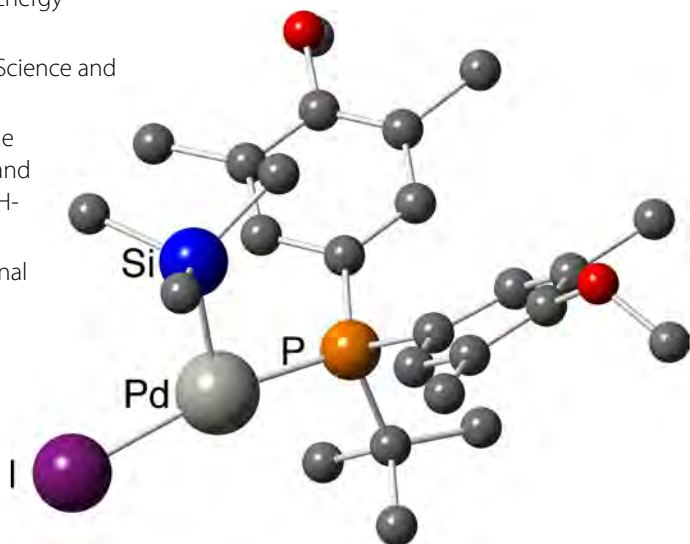
“The university’s central location provided me networking opportunities with professionals from major chemical corporations.”

- Rachel Pupillo, PhD Student

In addition, our faculty members are associated with numerous other centers and institutes from across the campus and Delaware research community, including:

- » Delaware Biotechnology Institute
- » Catalysis Center for Energy Innovation
- » Center for Catalytic Science and Technology
- » Center for Membrane Protein Production and Characterization (NIH-COBRE)
- » Center for Translational Cancer Research

Discovering a new chemical reaction. X-Ray diffraction structure of a palladium silyl iodide complex from the Silyl-Heck reaction. ▶



Graduate Student Life

Our department prides itself on providing an outstanding graduate student experience. In addition to a heavy focus in research training, our program provides in-depth, rigorous coursework to prepare our students for the intellectual demands of modern science. Furthermore, students are exposed to the forefront of research in multiple weekly seminar series and student-run journal clubs.

Over 180 PhD students are currently being trained in our program. All PhD students are supported by a graduate stipend that is guaranteed for five years, allowing our students to focus on their research and education without financial burden.

The University of Delaware is located in Newark, DE in the heart of the mid-Atlantic region. Our close proximity to major east coast cities (within 90 minutes of both New York City and Washington, DC) provides easy access to major urban centers, yet the small town

“Everything is close and there is always something to do.”

—*Natasha Kowaleuski,*
PhD Student





“Newark has a small town feel that makes you feel at home while still being close to major cities.”

- Mackenzie Lauro,
PhD Student

feel of Newark provides for a comfortable and affordable life-style.

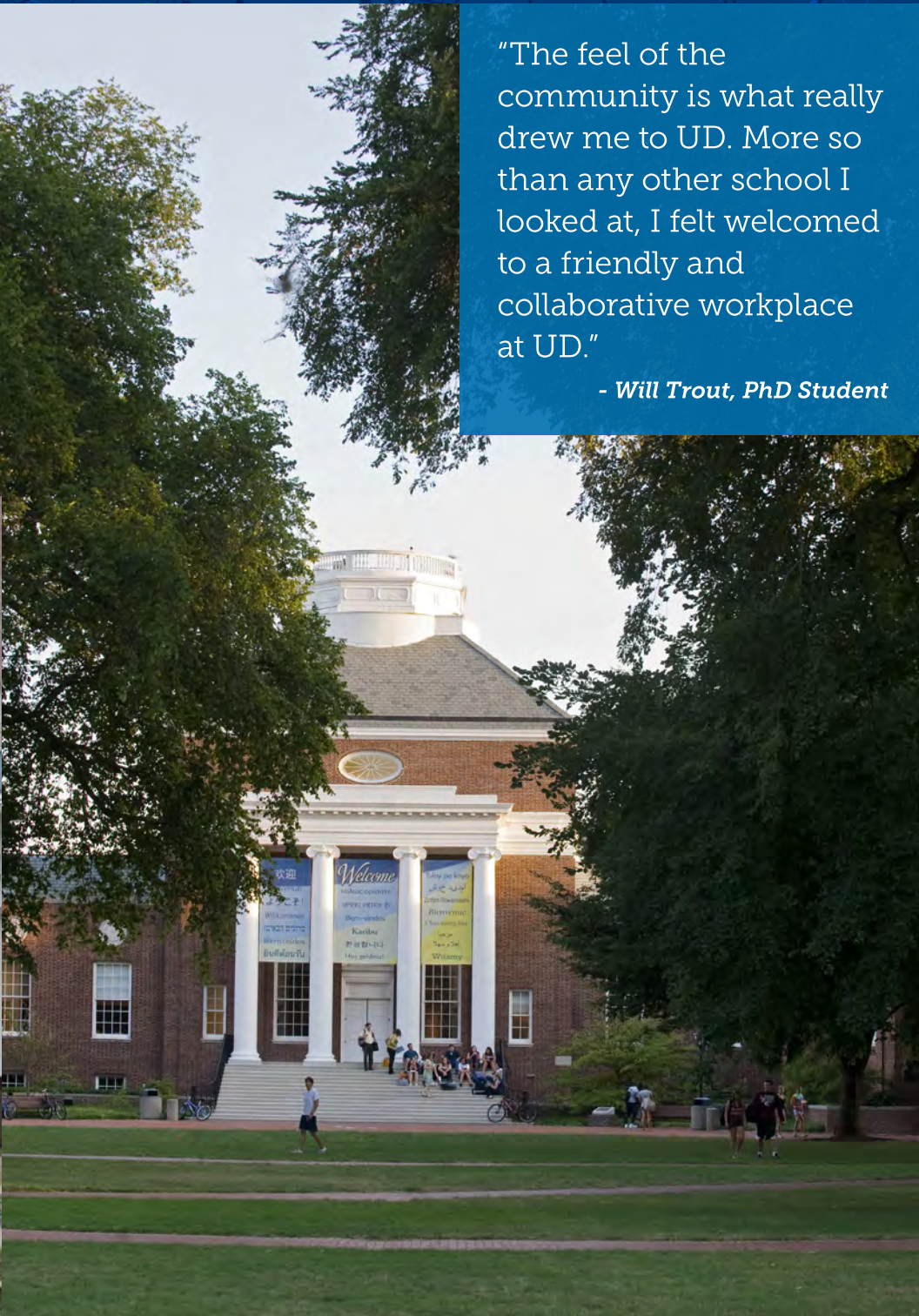
For more info

For more about our department, as well as links to the online application forms, can be found at www.chem.udel.edu. The application deadline is February 1. A limited number of fee waivers are available to encourage applicants from underrepresented backgrounds (see gradwav.dbi.udel.edu).



"The feel of the community is what really drew me to UD. More so than any other school I looked at, I felt welcomed to a friendly and collaborative workplace at UD."

- Will Trout, PhD Student



DEPARTMENT of CHEMISTRY & BIOCHEMISTRY



Daniel Nathans
University of Delaware, B.S. 1950
1978 Nobel Laureate
in Physiology or Medicine

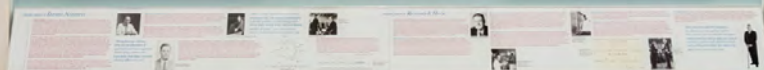
Dr. Daniel Nathans graduated with distinction with a B.S. degree in Chemistry from the University of Delaware in 1950. Nathans is a Whittieran native, and a professor at The Johns Hopkins University, National Institutes of Health and other of the Washington, D.C. area. He was awarded the Nobel Prize in Physiology or Medicine in 1978. The Prize was awarded "for the discovery of restriction enzymes and their application in particular in genetic engineering." Nathans has been in one of the forefront of molecular biology and genetic genes. His research laid the groundwork for the mapping of the human genome.

HONORING
OUR
NOBEL
LAUREATES



Richard F. Heck
Professor of Chemistry & Biochemistry
2010 Nobel Laureate in Chemistry
"For Palladium-Catalyzed Cross-Coupling"

After a career in industry, Professor Richard F. Heck returned to academia, received a doctorate from the University of Delaware, and then joined the faculty of the University of Delaware. He has received numerous national and international awards, including the Nobel Prize in Chemistry in 2010. His research has been in the area of cross-coupling reactions, which are used in the synthesis of pharmaceuticals, materials, and other complex molecules. His work has been instrumental in the development of new catalysts and reaction conditions for these reactions, which are now widely used in the pharmaceutical and materials industries.



Contact us

Graduate Director,
Dept. of Chemistry & Biochemistry

University of Delaware
Newark, DE 19716

302-831-2462

chem-grad@udel.edu

www.chem.udel.edu

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