Cancer & Molecular Biology

CSHL is one of the most influential centers for cancer research in the world. Landmark developments range from new genomic technologies to breakthrough therapeutic strategies. Fundamental research into basic molecular mechanisms of cell physiology have greatly enhanced the understanding of the underlying causes of cancer and other diseases and have helped to identify new clinical targets.

Genetics & Genomics

CSHL’s approach to understanding complex developmental decisions involves an intersection of multiple disciplines including forward and reverse genetics, functional genomics, and bioinformatics. These approaches have led to the development of novel experimental techniques and analysis tools that have informed the understanding of normal development and disease.

Neuroscience

CSHL is leading research into how neuronal networks affect behavior and how their disruption contributes to cognitive disorders. Fundamental discoveries have focused on a systems-level understanding of memory, sensory processing, decision-making, and pathologies such as autism, Alzheimer's, schizophrenia and depression.

Plant Biology

CSHL has long been contributing essential knowledge to understanding the genetic basis of plant development. Discoveries have made a direct impact on boosting crop yield and developing biofuels, with implications for food production, biodiversity and climate change.

Quantitative Biology

CSHL is encouraging the search for new solutions to important, unsolved problems in biology through quantitative approaches. A cross-disciplinary group of researchers with expertise in applied mathematics, computer science, theoretical physics and engineering are using their unique perspectives to understand human genetics, neural system architecture, and complex diseases.
Cold Spring Harbor Laboratory has a long and exceptional history of ground-breaking biomedical research and the education of outstanding scientists. Research at CSHL focuses on cancer & molecular biology, genetics & genomics, neuroscience, plant biology, and quantitative biology. The Watson School of Biological Sciences at CSHL offers scientific training for high school students, undergraduates, graduate students, and postdoctoral fellows. We provide programs for scientists at these diverse stages of their careers in a uniquely collaborative research environment.
“When I came to CSHL for my interviews, it was emphasized that the PIs do not just look for students, they look for future colleagues. While this idea was a little daunting at first, it proved to be very true - I do not think there would have been many other places where my growth as a scientist could have been encouraged as much.”

- Jue Xiang Wang
Furukawa lab
undergraduate: University of Cambridge (UK)

“CSHL is a melting pot of people, ideas, and technologies across biological sciences and from all over the world. This unique diversity cultivates an environment of creativity and collaboration that produces trail-blazing research and inspires the next generation of scientists. It’s great being a student and a scientist here.”

-- Michael Gutbrod
Martienssen lab
undergraduate: University of Illinois at Urbana-Champaign
The Ph.D. Program at CSHL is an innovative, accelerated program designed for exceptional students, offering several important features:
• approximately 4 - 5 years from matriculation to the Ph.D.
• broad representation of the biological sciences
• course work and laboratory rotations in separate phases and completed in the first 10 months
• elective advanced courses throughout the graduate studies
• two-tier mentoring and scheduled thesis committee meetings
• complete funding - stipend, tuition, research allowance and associated costs - provided by the School, allowing full choice of research projects

Approximately 10 students join the program each year. Any student with an undergraduate degree from an accredited academic institution is eligible. Watson School students come from all over the world, with more than 20 US states and 25 countries represented in the program. The Watson School encourages applicants from any academic background, including non-bioscience majors like computer science, engineering, math, chemistry, and physics. The application requires official transcripts, a personal statement, and three letters of recommendation. Students from non-English language universities must submit TOEFL or IELTS test scores. The GRE general test is recommended but not required. Applications must be submitted online by December 1.

For more information, visit www.cshl.edu/gradschool or contact us at gradschool@cshl.edu.
Degree Requirements

Coursework
- Introductory Bootcamps:
  - Molecular & Cell Biology
  - Quantitative Biology
- Scientific Reasoning & Logic:
  - Development
  - Gene Expression
  - Grants Study Section
  - Macromolecular Structure
  - Neurobiology
- Scientific Exposition & Ethics
- Specialized Disciplines:
  - Cancer Biology
  - Genetics & Genomics
  - Quantitative Biology
  - Systems Neuroscience
- Topics in Biology (4 courses)
  - for example:
    - Evolution
    - Immunology
    - Microbial Pathogenesis
    - Physical Biology of the Cell

Seminars & Symposia
- Integrated Fall Term Exam
- Laboratory Rotations (3)
- Teaching at DNA Learning Center
- Qualifying Exam
- Elective Postgraduate Courses (3)
- Thesis Proposal Defense
- Thesis Dissertation
- Thesis Defense

YEAR 1
- Fall term courses & exam
- Laboratory rotations
- DNALC Teaching
- Topics in Biology courses
- Qualifying exam
- Thesis research
- Thesis proposal defense
- Thesis committee meetings
- Postgraduate courses

YEAR 2

YEAR 3

YEAR 4
Stipend and Benefits

The Watson School Ph.D. program stipend is adjusted annually - currently $34,000 per year. Students who are awarded an external fellowship receive $37,400 or the amount of their fellowship stipend (whichever is higher). The Watson School pays all tuition costs and associated study fees for its students. Students receive a new laptop and all necessary software and textbooks, roughly $3,500 of materials. Once students join a research lab, they receive $8,000 in research funds annually to help support their thesis work.

Students are eligible for full health and dental benefits, and an on-campus health center offers routine medical and wellness services. Students have access to affordable campus child care. First-year students live in private rooms in the historic Knight or Cutting Houses on the harbor, a short walk from the main campus. CSHL offers relocation costs and housing subsidies. Dining services at the Laboratory are also subsidized.

CSHL has a free on-campus gym, and students receive an annual fitness supplement. In addition, there are numerous recreational activities on campus, including tennis and volleyball courts, kayaks and rowing boats, private beaches, hiking trails, and quiet back roads for running or cycling. In the summer, the Laboratory offers gardening plots on a first-come basis. There are a number of bands, dance groups, and sports teams at CSHL, organized by students and postdocs.

Student stipends are paid directly by the Watson School, allowing students to choose a lab and a project without the constraints of available funding. This flexibility encourages cross-disciplinary collaborative projects.

Many Watson School students successfully apply for independent fellowships. Over a quarter of Ph.D. students have been awarded NSF, NIH, DoD, NSERC, BIF, or similar grants to support their studies.

Watson School students have published over 400 papers from their thesis research - an average of more than three papers per student. Almost a quarter of these first-author papers appeared in Cell, Science, or Nature.

Four Watson School students have received the Harold M. Weintraub Graduate Student Award for outstanding thesis research - in 2003, 2005, 2010 and 2015.
Since the first graduate in 2003, there have been more than 100 Watson School Ph.D. Program graduates. They have gone on to pursue careers in academia, industry, biotechnology, publishing, management, and consulting. About a quarter of Watson School graduates - and more than half who graduated six or more years ago - have already secured tenure-track faculty positions at major research universities in the US and abroad. They are making significant impacts in the scientific community with their independent research.

Career paths of Watson School Ph.D. graduates

Immediately post-graduation 2003-2017 (n=98)

Currently, ≥ 6 years after graduation 2003-2011 (n=41)
The **Undergraduate Research Program** at CSHL provides an opportunity for undergraduate scientists from around the world to conduct first-rate research. Students learn the scientific process, technical methods and theoretical principles, and communicate their discoveries to other scientists. Approximately 20 students come to CSHL each summer for the 10-week program, living and working in the exciting Laboratory environment.

Any matriculated college sophomore or junior with a strong academic background may apply. Prior research experience is an asset but not a requirement. The selection committee places particular importance on letters of recommendation and the applicant’s personal statement. Applications must be submitted online by **January 15**. In addition to free room and board, participating students receive a $5,250 stipend for the summer.

For more information, visit [www.cshl.edu/URP](http://www.cshl.edu/URP) or contact us at urpadmin@cshl.edu.
“My URP experience has been unforgettable and uniquely instrumental in helping me to grow as a scientist through fun and thought-provoking challenges”

-Kellie Wilson
Albeanu lab
undergraduate: Washington University, St. Louis

“Mysterious here at CSHL has developed not only my professional research skills but has also developed my personal connection with the research field, community, and lifestyle built around it.”

-Jordan Ontiveros
Lippman lab
undergraduate: California State University, Fullerton
Postdoctoral Fellows are integral to the scientific community at CSHL. The Postdoctoral Program Office at the Watson School works closely with CSHL’s Postdoc Liaison Committee to offer a range of career development activities and ensure that the needs of the postdoc community are met. Postdocs benefit from the exceptional infrastructure and intellectual environment at CSHL and gain a marked advantage in the competitive job market. In recent years, many CSHL postdocs have taken up tenure-track positions at major research universities in the US and abroad. Others have pursued college teaching positions, editorial positions, and careers in biotechnology.

All postdocs are eligible for benefits, including comprehensive health and dental insurance, on-site child care, and housing subsidies, regardless of their source of funding.

For more information, visit www.cshl.edu/research/postdoctoral-research.html or contact us at postdocprogram@cshl.edu.
Long Island high school students with an interest in molecular biology and genetics can gain research experience through the **Partners for the Future** program. Students conduct an original, mentored research project at CSHL, spending several hours each week of their senior year working with a CSHL scientist. Students have access to state-of-the-art equipment and learn the latest experimental and computational techniques. They work on projects that make real impacts on the field of biological research.

The program is open to all Long Island high school seniors by nomination only. Each high school science department chairperson nominates three juniors for participation the following year. Semi-finalists are interviewed by CSHL scientists. Participants commit approximately ten hours each week, September through March of their senior year. The program concludes with a symposium, in which Partners present their work to the CSHL scientific community and guests.

For more information, visit www.cshl.edu/education/primary-a-secondary.html
“As a Partner, I was able to see the frontier of neuroscience research. I learned that research requires knowledge, skill, and a lot of dedication. With the help of my mentor, I was able to identify and map neurons for other scientists to use. I am proud of this accomplishment and to have been a Partner for the Future.”

- Luke Antolin
  Kepecs lab
  high school: Cold Spring Harbor

“To be a Partner in this program is exactly how it sounds; someone on equal footing whose ideas, thoughts and research are respected and built upon collaboratively. Throughout the year, I was surrounded by some of the most brilliant minds in their fields who guided me, critiqued my work, and gave me insight as to what it truly means to be a researcher. In the end, I found significant changes in transposable element expression in certain cancers - and I created lasting relationships with the amazing lab members who helped me succeed.”

- Melissa Cipolla
  M. Hammell lab
  high school: Friends Academy
Career Development

CSHL exposes students and postdocs to a variety of scientific careers. Through informal discussions and targeted career development opportunities, students and postdocs can gain valuable experience that will help them refine their future careers.

Trainees have numerous opportunities to gain teaching experience through activities within the Watson School or at local educational institutions. Postdocs may work as tutors for the first-year courses or take advantage of connections with local colleges and universities to gain teaching experience. Students and Postdocs interested in science education at the K-12 level may work with educators at CSHL’s Dolan DNA Learning Center, helping with curriculum development or teaching laboratory classes.

The Career Development Program at CSHL provides information about careers in academia, including the job search and transitioning to an independent position. They host workshops on preparing for interviews and a chalk talk, and “Getting to Know Your Faculty,” a series in which CSHL faculty members share stories of their careers and highlight their philosophies toward identifying interesting scientific questions, lab management, work-life balance, and what it takes to be successful.

The Bioscience Enterprise Club provides information for students and postdocs interested in non-academic scientific careers through a series of seminars and workshops. The topics cover a wide range of non-academic and non-research careers, from biotechnology and intellectual property to scientific publishing, non-profit administration, and venture capitalism. The Bioscience Enterprise Club has worked with local biotechnology start-up companies to offer on-campus recruiting interviews.

The CSHL WiSE (Women in Science and Engineering) was founded to create a strong and collaborative support system for women scientists at CSHL and beyond. To address challenges disproportionately affecting women in STEM, WiSE provides a platform for professional development and empowerment through mentorship, career planning, community outreach and educational opportunities. WiSE is open to all members of the CSHL community.

INet NYC is an organization that aims to provide support and professional development opportunities for international STEM scientists affiliated with institutions in the NYC area. INet NYC organizes events that are focused on the challenges that international scientists face in order to become successful within the US.
Each year, **CSHL’s Meetings & Courses** program attracts over 10,000 scientists and students from around the world to learn new technologies and share advances in biological research. CSHL students and postdocs are invited to attend the lectures, poster sessions, and social events at the meetings, including the traditional wine and cheese. Ph.D. students select three courses as part of their advanced degree requirements. The Watson School and Meetings & Courses publish "Current Exchange", the student-run science magazine.

meetings.cshl.edu/

**Banbury Center** conferences bring together influential leaders and global experts to guide science and public policy. Watson School Ph.D. students may be invited to attend meetings related to their research interests.

www.cshl.edu/banbury/

**CSHL Press** publishes authoritative materials for the global scientific community, with a catalog of journals, books and manuals used in thousands of academic institutions worldwide.

www.cshlpress.com/

The **Dolan DNA Learning Center**, located in Cold Spring Harbor, is an innovator in science education for middle and high school students. Watson School Ph.D. students teach classes as part of their degree requirements. The DNALC also trains teachers in the latest biological advances. There are additional branches in Harlem and China. A new center will open soon in Brooklyn, N.Y.

www.dnalc.org/

**CSHL Library** maintains extensive print and online resources for scientists at the Laboratory. Librarians can help students and postdocs with bibliographic tools, literature searches, and article requests. The Archives are a rich collection of writings, photographs, and video interviews documenting the history of molecular biology at CSHL and beyond.

library.cshl.edu/
Cold Spring Harbor Laboratory has been a global leader in research and education. The international scientific community at the Laboratory provides a unique atmosphere for research — an environment where students, postdocs, and faculty work together on the most important unanswered biological questions. The Watson School is committed to provide its students and postdocs with the means to become successful, independent scientists and leaders in society.

CSHL’s research faculty has contributed some of the most fundamental discoveries in molecular biology, genetics and neuroscience throughout the Laboratory’s history. The current faculty members lead cutting-edge laboratories in a broad range of topics. Their discoveries are consistently recognized for their impact at a very high level. Thomson Reuters ranked CSHL first among molecular and cellular biology research institutes for literature citations. CSHL faculty are awarded approximately $30 million in federal research funds and $60 million in public support each year.

CSHL Scientists
50  Research faculty
160  Postdoctoral fellows
45  Watson School Ph.D. students
50  non-CSHL Ph.D. students
20  Undergraduate Research Program students

The CSHL campus is located on the wooded north shore of Long Island, 35 miles east of New York City. Frequent direct trains from Cold Spring Harbor arrive at Penn Station in Manhattan in less than an hour, making all the possibilities of New York City easily accessible. Shuttles run from campus to the nearby Syosset Long Island Rail Road station throughout the day. The village of Huntington, located just minutes away from CSHL, has restaurants, shops, movie theaters, and venues for live music. Long Island’s sandy South Shore beaches are a short drive away. The Laboratory itself offers many amenities, both cultural and recreational.