

Cold Spring Harbor Laboratory

WATSON SCHOOL OF BIOLOGICAL SCIENCES

Cancer & Molecular Biology

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

Genetics & Genomics

CSHL's approach to understanding complex diseases involves an intersection of multiple disciplines including human genetics, functional genomics, and bioinformatics. These varied approaches have led to the development of novel experimental techniques and analysis tools that have informed disease diagnosis and therapeutics, as well as the understanding of small RNA-based regulatory pathways.

Neuroscience

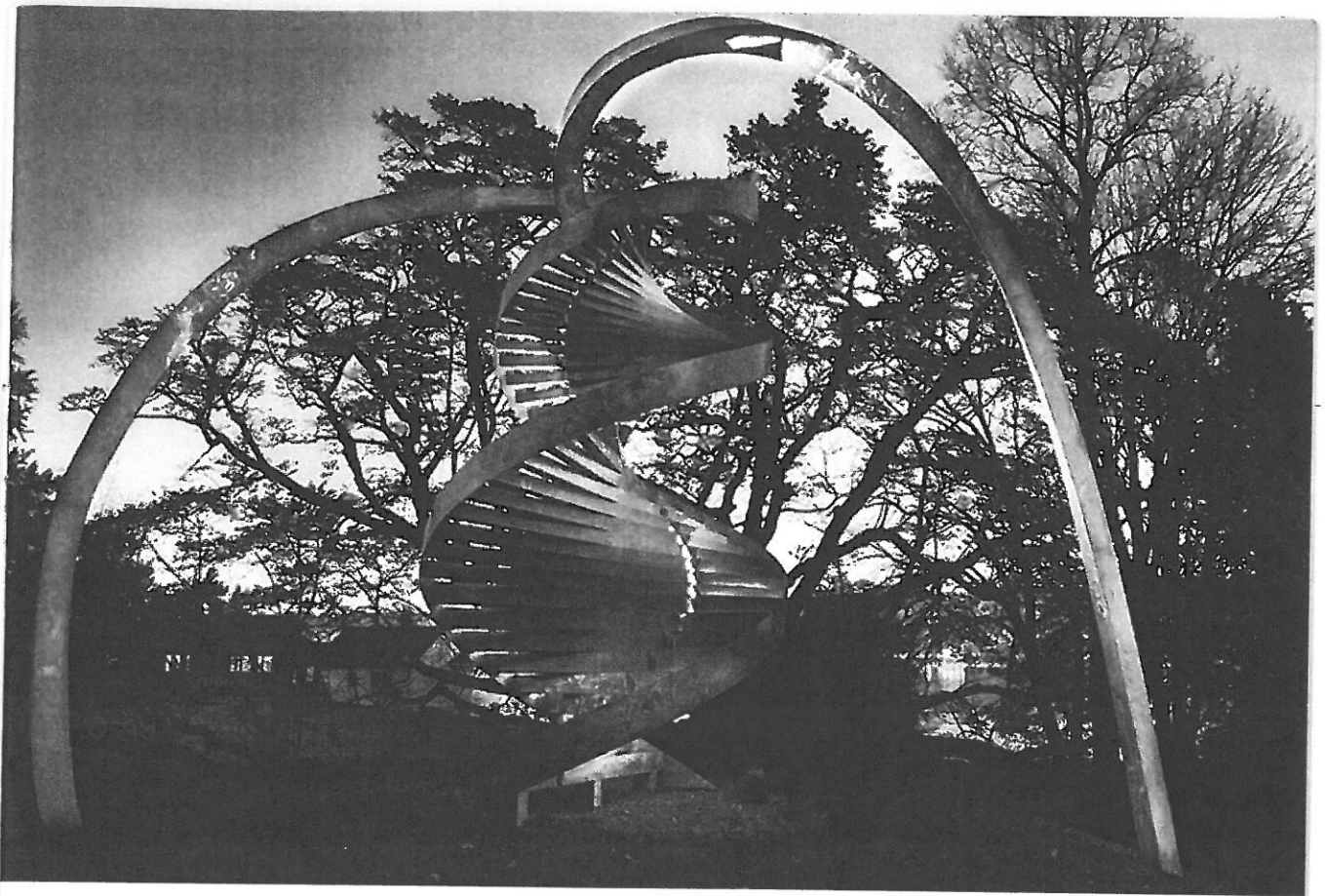
CSHL is leading research into how neuronal networks affect behavior and how their disruption contributes to cognitive disorders. Fundamental discoveries have focused on a systems-level understanding of memory, sensory processing, and decision-making, and pathologies including autism, Alzheimer's, schizophrenia 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 greater 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 bringing their unique perspectives to understand human genetics, neural system architecture, and complex diseases.



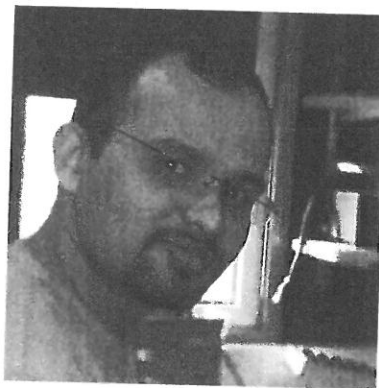
Cold Spring Harbor Laboratory has a long and exceptional history of ground-breaking biomedical research and the education of future generations of outstanding scientists. Research at CSHL focuses on cancer and molecular biology, genetics and genomics, neuroscience, plant biology, and quantitative biology. The Watson School of Biological Sciences at CSHL offers scientific training for undergraduates, graduate students, and postdoctoral fellows. We provide programs for scientists at these diverse stages of their careers in a uniquely collaborative research environment.



"The wonderful thing about CSHL is that there are many people around with knowledge and expertise that you can always talk to. Indeed, even while labs get ever more high-tech and the latest equipment is available to facilitate research, I think CSHL's most valuable resource remains the people here."

- Colleen Carlston
Watson School Ph.D. student, C. Hammell lab
undergraduate: Harvard University

"When I visited CSHL to interview, apart from the breathtakingly beautiful campus, what struck me most was a deep sense of history. It is here during the summers that the first molecular biologists met to chart the course of modern biology. Since then the Lab has been at the very frontier of biology research. That legacy continues to this day."



- Arkarup Bandyopadhyay
Watson School Ph.D. student, Albeanu lab
undergraduate: Tata Institute, University of Delhi

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

Bootcamps:

- Quantitative Biology
- Molecular & Cell Biology
- Scientific Reasoning & Logic
- Gene Expression
- Macromolecular Structure Development
- Cancer
- Neurobiology

Scientific Exposition & Ethics

Specialized Disciplines:

- Genetics & Genomics
- Systems Neuroscience
- Cell Structure & Function
- Quantitative Biology

Topics in Biology (4 courses)

for example: Immunology, Evolution, 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

Watson School students have **published over 250 papers** from their thesis research - an average of more than 3 papers per student, including first-author papers in high profile journals such as *Cell*, *Science*, and *Nature*.

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

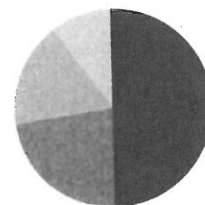
Stipend and Benefits

The Watson School Ph.D. program stipend is adjusted annually - currently \$33,000 per year. Students who are awarded an external fellowship receive a 10% bonus to the stipend. 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 per year for research costs. Students are eligible for full health benefits and have access to affordable campus child care. CSHL offers relocation costs and housing subsidies. Dining services at the Laboratory are also subsidized.

Career paths of Watson School Ph.D. graduates



Immediately post-graduation
2003-2014 (n=72)



Currently, > 6 years
after graduation
2003-2008 (n=30)

- Academic, independent
- Industry/biotech
- Postdoctoral research
- Other, scientific
- Other



Elizabeth Murchison
 Graduating Class of 2007
 since 2009:
Fellow
Wellcome Trust
 since 2013:
Reader
University of Cambridge



Chris Harvey
 Graduating Class of 2008
 since 2012:
Assistant Professor
Harvard University



Yaniv Erlich
 Graduating Class of 2010
 2009 - 2014:
Fellow
Whitehead Institute for
Biomedical Research
 since 2014:
Assistant Professor
Columbia University



Monica Dus
 Graduating Class of 2008
 since 2014:
Assistant Professor
University of Michigan



Wei Wei
 Graduating Class of 2008
 since 2012:
Assistant Professor
University of Chicago



Elena Ezkova
 Graduating Class of 2005
 since 2010:
Assistant Professor
Mount Sinai School of
Medicine

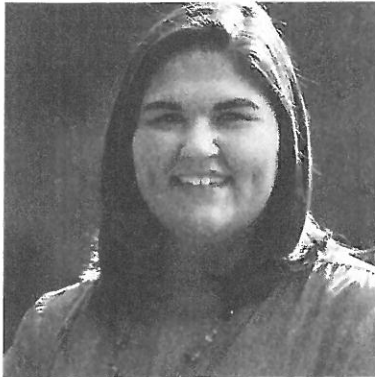


Jeremy Wilusz
 Graduating Class of 2009
 since 2014:
Assistant Professor
University of Pennsylvania



Niraj Tolia
 Graduating Class of 2004
 since 2007:
Assistant Professor
Washington University,
St. Louis

Since the first graduating class in 2004, there have been more than 70 Watson School Ph.D. Program **graduates**. They have gone on to pursue careers in research, industry, biotechnology, publishing, business and consulting. About a quarter of Watson School graduates 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.



"My URP summer was filled with weekends spent exploring both the breathtaking natural beauty of the Cold Spring Harbor Laboratory campus as well as the fascinating happenings in nearby New York City, and weekdays spent working on an exciting project in a world-class laboratory...
I have made friendships that will last a lifetime, and I cannot wait to get started with my career in science."

-Francesca Aloisio
undergraduate: University of Texas, Austin

A selection of Undergraduate Research Program alumni

Tania Baker, Ph.D.

URP summer: 1982
undergraduate: University of Wisconsin
Professor, MIT
HHMI Investigator

David Baltimore, Ph.D.

URP summer: 1959
undergraduate: Swarthmore College
Professor Emeritus, Caltech
Nobel Prize, 1975

Ewan Birney, Ph.D.

URP summer: 1993
undergraduate: Oxford University
Associate Director, European
Bioinformatics Institute

Charles Gilbert, Ph.D.

URP summer: 1969
undergraduate: Amherst College
Professor, The Rockefeller University

Alfred Goldberg, Ph.D.

URP summer: 1961
undergraduate: Harvard University
Professor, Harvard University

Timothy Mitchison, Ph.D.

URP summer: 1979
undergraduate: Oxford University
Professor, Harvard University

Gerald Rubin, Ph.D.

URP summer: 1970
undergraduate: MIT
Vice President of HHMI & Director,
Janelia Farm Research Campus

Barbara Sampson, M.D., Ph.D.

URP summer: 1987
undergraduate: Princeton University
Chief medical examiner, New York City

Geraldine Seydoux, Ph.D.

URP summer: 1985
undergraduate: University of Maine
Professor, Johns Hopkins University
HHMI Investigator

Gary Struhl, Ph.D.

URP summer: 1975
undergraduate: MIT
Professor, Columbia University
HHMI Investigator

Margaret Tucker, M.D.

URP summer: 1970
undergraduate: Wellesley College
Director, Human Genetics Program,
National Cancer Institute

Jerome Zeldis, M.D., Ph.D.

URP summer: 1972
undergraduate: Brown University
Chief Medical Officer, Celgene Corporation

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 25 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 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 room and board, participating students receive a generous stipend over the summer.

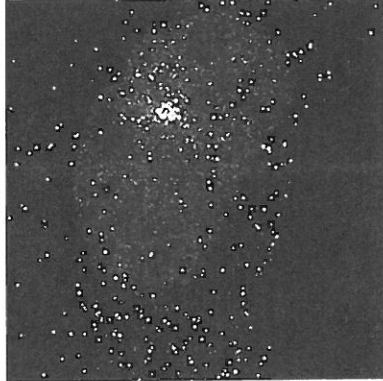
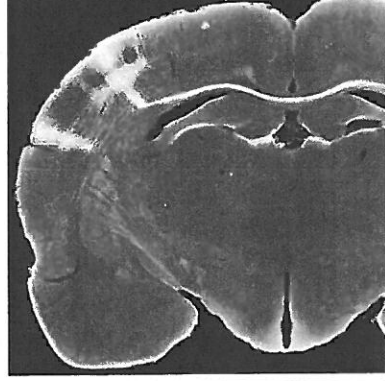
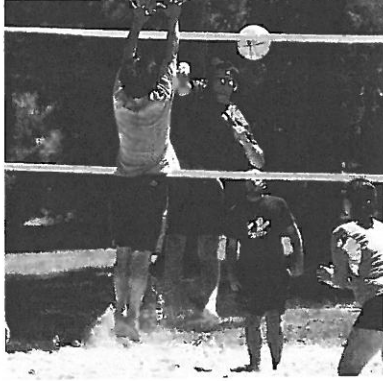
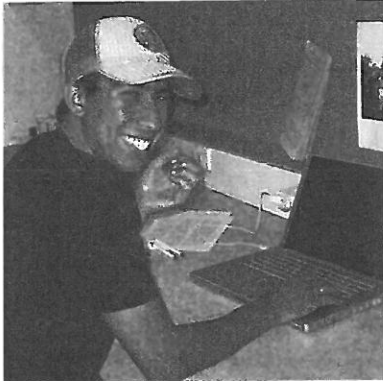
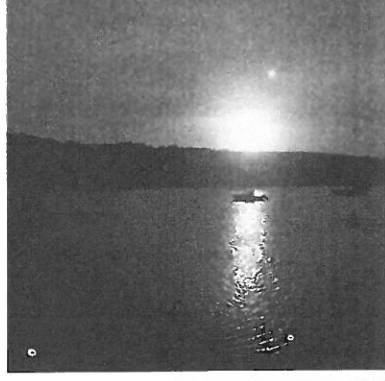
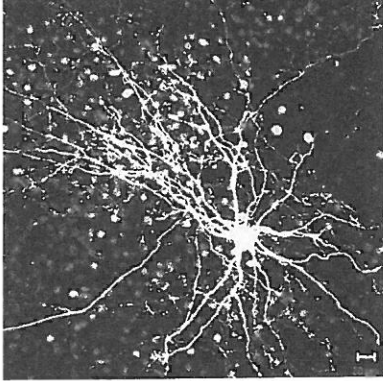
For more information, visit www.cshl.edu/URP or contact us at urpadmin@cshl.edu.



Postdoctoral Fellows are integral to the scientific community at CSHL. The Postdoctoral Program Office at the Watson School works closely with CSHL's Postdoc Liason 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 careers, and biotech research.

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

For more information, visit
www.cshl.edu/research/postdoctoral-research



Career Development Opportunities at the Watson School

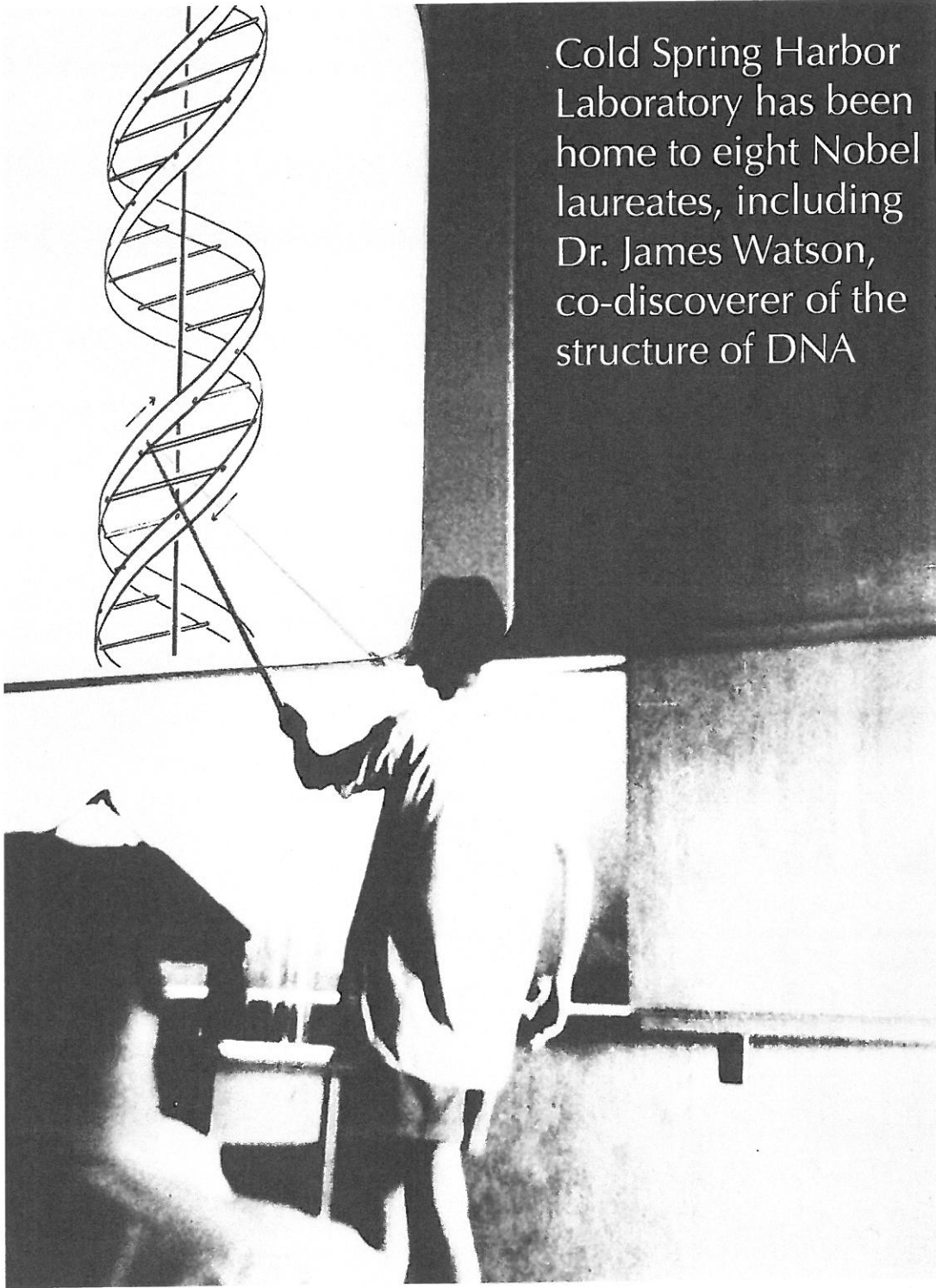
CSHL exposes students and postdocs to a variety of scientific careers, from traditional academic research careers to non-research careers in science writing, education or administration. Through informal discussion or targeted career development opportunities, students and postdocs can gain valuable experience that will help them refine their future careers.

Students and postdocs at CSHL have numerous opportunities to gain **teaching experience** through activities within the Watson School or at local educational institutions. Postdocs may work as tutors or discussion section leaders for the first-year Ph.D. courses. The Postdoctoral Program Office has connections with local colleges and universities to provide teaching experience for interested postdocs. Students and postdocs interested in science education at the K-12 level may work with educators at the Dolan DNA Learning Center, helping with curriculum development or teaching laboratory classes.

The **Career Development Program** at CSHL provides students and postdocs with information surrounding careers in academia, including the job search and transitioning to an independent position. The Career Development Program hosts workshops on preparing for a chalk talk, an integral part of the academic job search, 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 an extensive 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.
<http://www.cshl.edu/Postdoc-Research/bioscience-enterprise-club>

Cold Spring Harbor
Laboratory has been
home to eight Nobel
laureates, including
Dr. James Watson,
co-discoverer of the
structure of DNA



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 elect three courses as part of their advanced degree requirements. The Watson School and Meetings & Courses publish "Current Exchange", the student-run science magazine. <http://meetings.cshl.edu/>

The **Dolan DNA Learning Center** is an innovator in science education for middle and high school students. Watson School Ph.D. students teach courses as part of their degree requirements. The DNALC also trains teachers in the latest biological advances. There are DNALC branches in Cold Spring Harbor and Harlem, with plans for new centers in Manhattan and China.

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.

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. <http://www.cshlpress.com/>

CSHL Library maintains extensive print and online resources for scientists at the Laboratory and can help students and postdocs with bibliographic tools, literature searches, and article requests. The Archives is a rich collection of writings, photographs, and video interviews documenting CSHL's history and the important scientific discoveries that have been made at the Laboratory.



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postdocprogram@cshl.edu



Since 1890, 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
- 25 Undergraduate Research Program students

Cold Spring Harbor Laboratory's Watson School of Biological Science is institutionally accredited by the New York State Board of Regents and the Commissioner of Education, a nationally recognized accrediting agency, located at 89 Washington Avenue, Albany, NY 12234, (518) 474-1551.

The CSHL **campus** is located on the wooded north shore of Long Island, 35 miles east of New York City. The Laboratory offers many amenities, both cultural and recreational. There is a fitness room, tennis and volleyball courts, a private beach, kayaks, and many quiet back roads for running or walking. Students may also attend classical music performances and art exhibitions sponsored by CSHL for scientists and the neighboring community. 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.

