

Who We Are

SSRI connects qualified high school students from the New Haven area with scientific research labs at Yale. We hope to provide high-quality research experiences to New Haven students in order to excite them about scientific investigation, enable them to explore new scientific fields, and increase their college preparedness. In doing so, we hope to foster long-term relationships between Yale laboratories and qualified high school students who are enthusiastic about furthering the laboratories' research.

The program provides a framework for a mutually beneficial summer experience for both the students and labs. Yale undergraduate students supplement lab work for the high school interns with organized workshops and other mentorship activities. We also work to cultivate a sense of community among the students, organizing events to facilitate social interactions among the interns, as well as between the interns and their undergraduate, graduate, and professor mentors.

Summer at a Glance

- Students begin work in labs on Friday, June 29th, 2018
- Weekly workshops include
 - Keeping a Lab Notebook
 - Data Analysis and Basic Statistics
 - How to Write a Lab Report
 - How to Give a Scientific Presentation
- Speakers and seminars
- Lunch meetings with mentors
- Interaction events with professors
- Final presentations on Friday, August 3rd
- Further exploration through various competitions such as Intel and Siemens, and through the possibility of the student continuing to work in the lab during the school year.

Contact Information

If you have any questions or input for us, contact us at: SummerScienceResearchInstitute@gmail.com.

Program Dates

The program will run from Friday, June 29th until Friday, August 3rd.

The program begins with a day-long orientation for participants hosted by SSRI to acquaint students with their peers and undergraduate mentors, review program expectations, and complete required lab Safety Training modules in-person in addition to the research portion of the program, we supplement the students' lab experience with additional programming, detailed below.

Workshops

A workshop is held each Friday afternoon.

- **Publicizing Seminars**
We publicize seminars given by professors on campus that the students might be interested in attending.
- **Weekly Lunches with Undergraduate Mentors**
Small pods of 4-5 students meet with undergraduate mentors in order to ensure that their experience is social as well as educational.
- **End of Program Reports and Presentations**
On the last day of the program, students give a presentation and turn in a written report about their summer research.

Lab Matching Process

Applicants will rank their top preferences for labs. Applications will then be sent to the Primary Investigators (PIs) of the labs that students selected, and the PIs will choose which intern(s) to welcome to their labs for the summer. PIs also may choose to interview applicants before making final selections

After the Summer

One of the advantages of working with local high school students is that they can stay long enough to do meaningful work, to build a long-term relationship with the laboratory, and to develop a love for research. In the past, students have continued working in the lab during the school year and/or during school breaks.

SSRI also encourages and guides students who would like to enter their research in science competitions and fairs.

Eligibility

New Haven Public School students and New Haven parochial school students who

- will be at least 16 years old by the first day of the program.
- have a GPA of at least 3.0.

Application Instructions

The form for the 2018 application cycle is available online at ssri.sites.yale.edu or at the following link: https://yalesurvey.qualtrics.com/jfe/form/SV_dmXOSkIZ7NyJ7E1

Please ensure that you have read all the information and met all the requirements pertinent to the labs you are interested in applying to.

Please also have a PDF copy of your transcript and resume at hand.

The application asks for standard biographical information, lab ranking preference, and four brief, required essays.

In addition to the online application, please attain a teacher recommendation using the associated form and ensure that it is emailed to us at SummerScienceResearchInstitute@gmail.com before the application deadline.

See the following pages for information about the labs this summer.

The Laboratories

This summer at SSRI, students will conduct research on many topics at the forefront of science. It is imperative that you carefully read the laboratory information below in order to determine which labs would be the best matches for you.

Note that each lab has its own minimum qualifications and time requirements. DO NOT apply to any lab for which you are not qualified or whose time requirement you will be unable to fulfill. We strongly encourage you to learn more about the labs that interest you. To search for a lab or personal webpage, Google the name of the PI and “Yale.” Make certain to examine the research interests and recent publications posted on their websites.

Laboratory Information	Minimum Qualifications to Apply	Minimum Time Requirement	Brief Description of Research
PI: Joshua Gendron Molecular Cellular, and Developmental Biology	Excitement to do research!	6 weeks for at least 25 hours per week.	Plant molecular genetics studying circadian clocks.
PI: Patrick Loria Department of Chemistry, Kline Chemistry Lab	Interest and motivation.	6 weeks @ 25 hours/week	Studying proteins and them conformational changes.
PI: Julie Zimmerman Department of Chemical and Environmental Engineering	Would prefer someone who prior research experience and has taken chemistry.	6 weeks; 25 hours per week at a minimum. More weeks or hours are also possible.	Our lab is part of a research center focused on Nano-enabled Water Treatment. In support of this center, we are looking for students to join us lab on one of two projects: 1) synthesizing, treating, and characterizing nanomaterials and correlating these properties to potential hazard concerns for human health and the environment or 2) developing novel sorbents for application in drinking water

			treatment, specifically for the selective removal of inorganic contaminants such as arsenic and selenium
PI: Damon Clark Kline Biology Tower	Our research takes place almost exclusively on computers: data acquisition and analysis both happen on computers, using the programming language Matlab. It's probably not crucial that a student know Matlab, but a familiarity and comfort with programming will be important. Pathways to science student required	35 hours a week for 6 weeks.	Our lab is interested in understanding how small groups of neurons interact to guide visual behaviors. We work in the fruit fly, which has a variety of advantages for this sort of work. High school students in lab would be involved in acquiring data to measure how flies respond to a variety of visual stimuli.
PI: Menachem Elimelech Chemical and Environmental Engineering	Interns must have a genuine interest in water treatment and water desalination processes. Must have taken chemistry and physics. Must have shown abilities in the sciences and mathematics. Interns must have the goal of pursuing a college degree in STEM related fields.	6 weeks, 25 hours a week	Interns will shadow graduate students working on experiments. Hands-on duties involve preparing chemical solutions and handling chemicals, glassware and other laboratory equipment. Students will operate systems, perform calculations on spreadsheets, and review literature.
PI: Madhusudhan Venkadesan Department of Mechanical Engineering and Material Sciences	Preferably at least one high school class in Physics or Calculus.	25 hours for six weeks works well. The student is welcomed to spend more time each week if he or she wishes.	The topic will be able human muscles and their mechanical behavior. The student will learn to use engineering software (Solidworks) to design mechanical components that mimic human muscles. The student will also learn to 3D-print their designs using the resources available at Yale Engineering.
PI: Kathryn Miller-Jensen	Some interest and experience with computer programming would be	6-8 weeks at 25 hours per week	The student will help with image analysis for our microfluidic device experiments. If interested,

Biomedical Engineering, Malone Engineering Center	great but not absolutely necessary		the study could also learn to fabricate microfluidic devices from PDMS plastic.
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