

The Waksman Student Scholars Program

Sponsored by

RUTGERS UNIVERSITY

Waksman Institute

- FOR WHOM:** HIGH SCHOOL STUDENTS who have completed at least one Biology course
{*Teams of students and a teacher from each participating school*}
- WHEN:** July 5, 2016 – July 22, 2016 *and* during the 2016-2017 academic year
{*when the research is conducted at your school*}.
- WHERE:** Rutgers University, Waksman Institute, Piscataway, New Jersey
(Participants commute daily to the University.)
- WHAT:** *The Waksman Student Scholars Program (WSSP)* is a yearlong program that provides students with the opportunity to take part in a challenging research investigation. Basic concepts and relevant themes in molecular biology are explored in conjunction with a strong laboratory component. Throughout the summer Institute and during the academic year, emphasis is placed also on bioinformatics, computational biology, using the resources found on the Internet, and electronic communications.
- FUNDING:** Supported by Rutgers University.

REQUIREMENTS:

- Students must have completed at least one course of high school biology.
- Students must be entering the 10th, 11th or 12 grade in September 2016.
- Students must attend each day of the full three-week summer Institute.
- Participation with your Team in some of the after school, academic year follow-up meetings (a minimum of six meetings at Rutgers, which are scheduled in advance).
- During the academic year, schools support the work of the WSSP Team by offering a formal research course or an after school club at the high school.

OTHER:

- There is no student fee for participation in the summer Institute. Lunch is not provided.
- Students receive copies of materials and related supplies during the summer.
- Scholars who participate in the summer Institute form the nucleus for a larger group of students who work together on the research question back at your school during the academic year.
- Alumni of the WSSP can participate in related activities during the academic year, including Protein Modeling, if offered during the academic year.

Completed applications
should be sent to:

Dr. Andrew K. Vershon, Project Director
Rutgers University Waksman Institute
190 Frelinghuysen Road
Piscataway, New Jersey 08854-8020

APPLICATION DEADLINE: Friday, March 25, 2016

Teachers will be notified of your school's selection into the 2016 WSSP by Friday, April 15, 2016.

PROGRAM INFORMATION

The Waksman Student Scholars Program provides avenues for high school science students to participate in research in molecular biology and bioinformatics. Teams learn about genetic engineering, genomics, molecular biology and bioinformatics by working on a research problem in these fields. This is a year long program that:

- * begins with a three week summer Institute (July 5, 2016 – July, 22, 2016).
- * continues back at each high school during the academic year when more students can become involved;
- * and concludes the following spring with the **Waksman Forum Poster Session**.

High schools that participate in the *Waksman Student Scholars Program (WSSP)* are represented during the summer Institute by a Student Scholar or, if your school is new to the Program, a team made up of two Student Scholars and their Team Teacher. Applications for the summer Institute are available for students (Student Application) and their teacher (Teacher Application). Each high school Team is selected using a competitive application process.

The research project for the 2016/2017 year focuses on the genomic sequence analysis of a Duckweed plant from the *Lemnaceae* family and how the genes in this organism compare to other species. We'll begin our work on the project by isolating and sequencing genes. These gene sequences have never been determined and the results of the final analysis of these data conducted by your students will be deposited in the international sequence databases for other scientists to use. We will compare these sequences with genes from other eukaryotes to determine the evolutionary relationship of these organisms and the sequence conservation of specific genes. Most of modern molecular biology and related scientific fields rely on the use of computational technologies to analyze data, and bioinformatics will be strongly emphasized.

Teams begin their work by attending a three-week summer Institute at the Rutgers University Waksman Institute, a modern research institution that specializes in fields such as Developmental Genetics, Cell Biology, and Molecular Genetics. During this time, students learn about experimental design, research methodology, laboratory procedures, data collection and analysis, scientific reporting, the integration of computer technologies, and the presentation of findings. Also, students learn about career opportunities in the fields of science, technology, and education. In addition to becoming familiar with the laboratory skills and investigative techniques required for the Student Scholars to conduct their research, there will be a strong emphasis on the use of information technology and bioinformatics.

A unique component of the WSSP is that the research initiated in the summer continues during the academic year when *the research investigations are actually conducted back at each high school*. Scholars who participated in the summer Institute form the nucleus for a larger group of students back at each school. This larger group works together on the research question with guidance from their Team Teacher.

A variety of activities support the research work of the Scholars during the academic year. Teams maintain an ongoing association with project faculty and scientists by using the school's electronic communications capabilities. Students will conduct DNA sequence analyses using the DNA Sequence Analysis Program or DSAP. A series of six follow up workshops will be held at the Waksman Institute. Materials and supplies necessary to conduct the research at the schools will be provided (high cost equipment cannot be provided but some equipment can be loaned to the schools). The 2016 WSSP will conclude in late spring, 2017, when Student Scholars present their work at the annual **Waksman Forum Poster Session**.

The WSSP will be entering its twenty fourth year with the start of the 2016 Program.

For additional information about the WSSP, visit our Home Page at:

<https://wssp.rutgers.edu>

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Email (*best*): coletta@waksman.rutgers.edu

2016
WAKSMAN STUDENT SCHOLARS PROGRAM
STUDENT APPLICATION FORM

NAME _____ DATE _____

AGE _____ E-MAIL (personal) _____

HOME ADDRESS _____

CITY, STATE _____ ZIP _____

HOME PHONE _____ YOUR CELL PHONE _____

NAME OF PARENT OR LEGAL GUARDIAN _____

DAYTIME/BUSINESS PHONE OF PARENT/GUARDIAN _____

**ETHNIC ORIGIN INFORMATION
(optional)**

____ American Indian/ Alaskan Native
____ Pacific Islander
____ Black, non Hispanic

**GENDER INFORMATION
(optional)**

____ Hispanic
____ Asian
____ White, non Hispanic
____ Male ____ Female

GRADE YOU WILL BE ENTERING IN SEPTEMBER, 2016 _____

SCHOOL NAME _____

SCHOOL ADDRESS _____

CITY, STATE _____ ZIP _____

PRINCIPAL'S NAME _____

GUIDANCE COUNSELOR'S NAME _____

CURRENT SCIENCE TEACHER'S NAME _____

Please indicate the name of your high school science teacher who will work with your WSSP Team in September, 2016:

Has your high school participated in past Waksman Student Scholars Programs? __Yes __No

ACADEMIC INFORMATION

Science and Mathematics Courses completed as of June, 2016	Grade received	Year Taken

BACKGROUND INFORMATION

- Extra Curricular Activities - including clubs, volunteering, other summer programs, & employment	Position Held	Dates

****** ENDORSEMENT OF YOUR APPLICATION ******

Please have your guidance counselor or a science teacher *and* your parent/ guardian endorse your application to the 2016 WSSP by signing below.

I acknowledge and support this application of _____
 Name of High School Student (Applicant) (please print)

to the 2016 Waksman Student Scholars Program. I understand that if selected, s/he is expected to participate in each day's activities for the full three-week summer Institute.

 Signature of High School Student

 Date

 Signature of Parent or Guardian of Applicant

 Date

 Guidance Counselor or Teacher Name (print)

 Guidance Counselor or Teacher Signature

PERSONAL STATEMENT

If you have already participated in the WSSP at your school, please respond to the following, limiting your essay to 200 words:

Describe how the WSSP project is conducted at your school. What laboratory activities did you work through? Have you done bioinformatics using DSAP? Why do you want to participate in this summer's Institute?

If you have not participated previously in the WSSP research, please respond to the following, limiting your essay to 200 words.

Describe your most "interesting" high school activity or situation that deals with science. Why was this interesting? How has this experience influenced you?

TO COMPLETE YOUR APPLICATION, PLEASE INCLUDE A COPY OF YOUR HIGH SCHOOL TRANSCRIPT & CURRENT REPORT CARD WITH YOUR APPLICATION