

Rutgers holds high school summer program

By Eddy Ball, Jamie Moscovitz, and Alessandro Venosa

Thanks, in part, to NIEHS-funded programs at Rutgers University, 46 high school students gained new insights into laboratory techniques and real-world applications of toxicology this summer.

The young people, rising sophomores, juniors, and seniors from 30 high schools in New Jersey and surrounding states, were participants in the first Toxicology, Health, and Environmental Disease (THED) High School Summer Program held at the Rutgers University Environmental and Occupational Health Sciences Institute (EOHSI) and Ernest Mario School of Pharmacy. The Rutgers Robert Wood Johnson Medical School and the School of Public Health, along with the NIEHS Center for Environmental Exposure and Disease, provided additional support for the program.

The instructors, who were graduate students and faculty of the Joint Graduate Program in Toxicology at Rutgers, included NIEHS-funded [Training in Environmental Toxicology](#)

(http://projectreporter.nih.gov/project_info_description.cfm?aid=8517722&icde=17494592&ddparam=&ddvalue=&ddsub=&cr=4&csb=default&cs=ASC) trainees Jamie Moscovitz, Kristin Bircsak, and Thea Golden, Pharm.D., and NIEHS Outstanding New Environmental Scientist awardee [Lauren Aleksunes, Pharm.D., Ph.D.](#)

(http://pharmacy.rutgers.edu/content/faculty_profile_99)

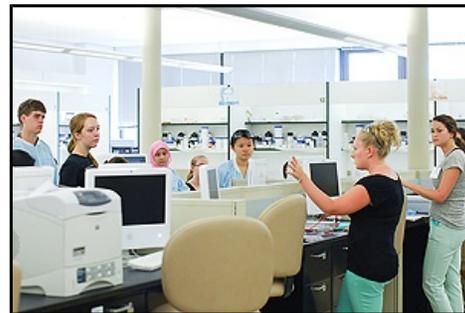
Participants met with undergraduates supported by the NIEHS Summer Research Training in Environmental Health Sciences grant and the Program Director Debra Laskin, Ph.D. The students also participated in tours of research facilities organized by the Community Outreach and Education Core of the NIEHS-supported Center for Environmental Exposures and Disease.

"The program gave us a chance to let these students in on a well-kept secret," Aleksunes said. "Toxicology isn't just an important part in the foundation of public health. It's a lot of fun, too."

A fast-paced and effective curriculum

The two one-week-long instructional sessions in July had ambitious goals, with overall objectives for the program including:

- Introducing students to a variety of modern laboratory techniques used in the biomedical and environmental health sciences fields
- Training students to analyze results and determine real-world applications of data collected
- Exposing students to different career opportunities within medicine, pharmacy, toxicology, environmental health science, and research, through presentations and discussions with professionals.



As a small group of high school students gathered on the other side of the bench, graduate student instructors Allison Isola, center, and Moscovitz, right, explained background information for upcoming laboratory sessions. (Photo courtesy of Wilson Rodriguez)



Participants began the week with hands-on practice in the fundamentals of pipetting. (Photo courtesy of Wilson Rodriguez)



During their week at Rutgers, most of the students gained their first experience in state-of-the-art histology and pathology. (Photo courtesy of Wilson Rodriguez)

The curriculum revolved around three toxicology-related themes - cellular injury, cellular response, and genetic predisposition. Interestingly, three-quarters of the participants were female. Students said they enrolled in the program because of their interest in biomedical research.

Students spent 30 percent of the week participating in laboratory activities, and 70 percent in classroom activities, learning about critical concepts and applications of toxicology and public health to current events. Each activity had instructor to student ratios between 1-to-4 and 1-to-8, to ensure individual attention for participants. The week of learning culminated with group presentations to parents and instructors of the various activities completed.

Evaluating specific outcomes

Students completed both preprogram and post-program surveys assessing research abilities and knowledge as outcomes. Following completion of the program, students scored themselves higher in their ability to perform laboratory techniques, including pipetting, DNA isolation, and cell culture.

Students also reported greater comfort with giving presentations and analyzing clinical findings. Using a 20 question true or false quiz on toxicology-related topics, students preprogram scored 67 percent correct, and post-program scored 81 percent correct. Furthermore, students ranked the genetics, histology, and pathology labs as their favorite activities.

Applications for the 2014 THED High School Summer Program will be available online at the [EOHSI Web page](http://eohsi.rutgers.edu/) (<http://eohsi.rutgers.edu/>) in the spring.

(Jamie Moscovitz and Alessandro Venosa are Ph.D. candidates in the Joint Graduate Program in Toxicology at Rutgers University, and served as the primary course instructors for the 2013 program.)



After completing their safety training and donning protective gear, students fixed and stained cells during the dose-response laboratory session. (Photo courtesy of Wilson Rodriguez)

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