

12 HHS Students Experience Genetic Workshop At University Of Texas In Austin

By Rob O'Connor and University of Texas-Austin

The future just got a whole lot bigger for 12 HHS students who were selected to attend a three-day STEM workshop at the University of Texas at Austin earlier this month. Their science and robotics teacher, Rob O'Connor, had gone to school with Rick Smith, an anthropology doctoral UT candidate. The two, along with Deborah Bolnick from the UT Austin Dept. of Anthropology, collaborated to plan the trip as after HHS received grant monies to fund the trip.

The students experienced a highly specialized genetics procedure that provided them with hands on experience in a genetics laboratory. Smith and O'Connor further focused the trip on guiding students along

pathways to and through college.

The students selected to attend included Hispanic sophomores and seniors from biology class, robotics club and the local chapter of the National Honor Society—most of which were prospective first-generation college students.

"We have a real diversity problem in science, and that's something that we want to address because people from different walks of life all have different perspectives and ideas that are needed in our discipline," said Smith. "If we want to make science better, we need to continue improving access and representation."

Genetics: Smith's research at the University of Texas is centered on the extraction of an-

cient human DNA and deciphering what those genes may indicate about ancient people. He petitioned Bolnick for the use of her Gene lab and she graciously allowed the Hart students to come.

These students extracted their own mitochondrial DNA from saliva. The extraction involved many steps and the use of specialized tools and technologies, such as a micropipette, a vortexer and a microcentrifuge. Once the DNA was extracted and cleaned up, samples were inspected with a spectrophotometer to ensure that DNA was present. At this point, the students had a few drops of clear fluid containing their DNA. In order to proceed, millions and millions of copies were needed. DNA was placed in a Polymerase Chain Reaction (PCR) device, which is a "DNA photocopier." After two hours of copying, students took a small sample of the reproduced DNA and ran it through a process called Gel Electrophoresis. This gel test determined that the PCR did its job and that there were indeed millions of copies of DNA present for each student. DNA samples were then sent off for Sanger Sequencing (a 24-hour process) on a \$100,000 sequencer housed at UT.

The DNA had to be sequenced in order to determine how each student's genetic code matches with other human codes from around the world. Student matches indicated probabilities of ancestral roots from large geographic regions, such as North America, South America, Southeast Asia, Europe and Africa.

University Tour: The second day of our trip was filled with an eight-mile overview of UT. HHS students had a fast-paced walking tour of the 51,000-student campus, where they saw one of 16 libraries, Jester Dor-



I'lyne Marquez, right, HHS student, practices extracting DNA in Deborah Bolnick's UT-Austin anthropology lab. Also pictured, l to r, is Yeyrany Minjarez, Camrie Neudorf and a UT student.

mitory (which houses about 3,000 residents), Darrell Royal football stadium, the clock tower, and many other buildings.

Specialized tours were arranged in the colleges of Computer Science and Mechanical Engineering. HHS students were able to see classrooms, study areas and research labs for artificial intelligence and robotics. Within the robotics lab, Dr. Luis Sentis shared designs which have been funded by NASA and other designs for which he and his colleagues currently are seeking funding.

Admissions & First Generation Panel: At the end of the second day on campus, the HHS students met with three people regarding admissions. This was organized with the help of the Center for Diversity and Community Engagement and the Longhorn Center for Academic Excellence.

The presenters focused on the struggles and difficulties that students such as these from Hart will face as they enter college. First-generation minority

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