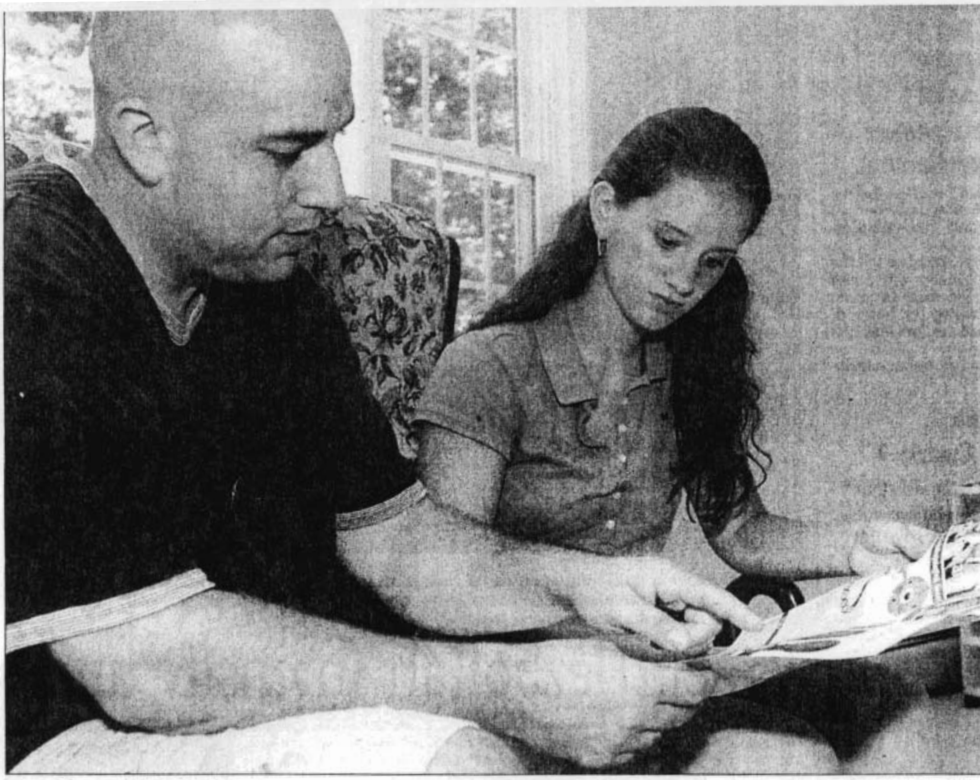

Laura Koscomb, 16, and teacher Frank La Banca look at a world map that traces genetics. They were participants in the the National Geographic Genographic Project.

The News-Times/ Carol Kaliff

Students take part in ancestral study

By Eileen FitzGerald
THE NEWS-TIMES

Cells from the cheek of 16-year-old Laura Koscomb now are part of a historic collection that will genetically map the world and create a picture of where and when ancient humans moved around more than 60,000 years.

The Newtown High School senior is among 185,000 people from around the globe who have participated so far in the National Geographic Genographic Project, a partnership among National Geographic Society, IBM, geneticist Spencer Wells, and the Waitt Family Foundation.

The unprecedented project, which is in the second of five years, will collect DNA internationally and tell the genetic history of humans through the ages.

"I sent away a sample from each cheek and they will compare the cheek cells to DNA from around the world. It will tell you what path your ancestors took from Africa," Koscomb said. "I think it's really cool that they found a way to do this."

Participants receive a personalized genetic analysis, an online overview of ancestral history, a map of where their ancestors originated and a map on which to trace relatives' journeys across the planet.

New DNA studies suggest that all humans descended from African ancestors who lived 60,000 years ago, National Geographic reported on its Web site.

The latest DNA research has found that most genes that are passed from a mother and father to a child are mixed up.

Some remain what National Geographic calls "unshuffled" or pure. Within these unshuffled DNA segments, the genetic code is varied through occasional mutations. It is these mutations that are passed down through generations and become genetic markers of descent.

By processing the DNAs collected through the cheek cultures, the National Geographic scientists can map the appearance and frequency of genetic markers in modern people, which will determine the paths taken by the descendents of a small group of Africans.

The project is more important now than ever, National Geographic has reported, because more and more populations are shrinking and mixing, and genetic signals are being scrambled.

The goal is to acquire genetic samples both from the world's remaining indigenous and traditional peoples, whose ethnic and genetic identities are isolated, and the modern populations.

"We see this as the 'moon shot' of anthropology, using genetics to fill in the gaps in our knowledge of human history," said project leader Wells in a press statement.

"Our DNA carries a story that is shared by everyone. Over the next five years we'll be deciphering that story, which is now in danger of being lost as people migrate and mix to a much greater extent than they have in the past.

The project aims to answer many questions, the Web-site reports, such as:

■ How many waves of migration were there into the Americas?

■ Is there a genetic signal from the expansion of indigenous American agriculture — for example, was it farmers or the culture that moved?

"A lot of people don't know the reality of how connected we are, that everyone started in the same place, that we all branched out, yet in reality we are all the same."

Laura Koscomb
Newtown High School senior

■ Were there any migrations to South America from the Pacific?

■ How do we account for the extraordinary linguistic diversity found in South America; have populations been separate for a long period of time? When did modern humans first colonize the Arctic?

■ Did Alexander the Great's armies leave a genetic trail?

■ How has colonialism had an impact on the genetic patterns in Africa? And if we share a recent common ancestry, why do we look so different from each other?"

This project can open people's eyes, Koscomb said.

"A lot of people don't know the reality of how connected we are," Koscomb said, "that everyone started in the same place, that we all branched out, yet in reality we are all the same."

Koscomb said she learned that before the continents split, Africa was in the middle of them, so it made sense to her that the roots of the human population would stem from there.

She said she loves the whole study of DNA. She sees its potential for the future and hopes to study bio- chemistry and concentrate on DNA in college.

"DNA is everywhere. The processes are so advanced that you can get right down to base pairs," she said. "If we know what's going on in DNA, it will help us understand the rest of the world, like how viruses work or how a bacteria wiped out a population."

Koscomb is among a dozen Connecticut high schools students who took part in this project during a week-long summer program called Pathways to Innovation Summer Institute.

It was sponsored by Education Connecticut, the region's educational support agency.

Education Connection will offer this project again in the fall during its year-long program for students interested in science, technology, engineering and mathematics, where they learn about different research facilities and receive help producing a science research project.

Newtown High School biology teacher Frank LaBanca, who teaches Koscomb in a science research class he started, mentored her last year and this summer in the Education Connection program.

"I think this is a great opportunity for scientific research to become connected to the general population. It's a way for people to understand how science works and to be a resource for science research," LaBanca said.

LaBanca wants students to do actual work with real results that have applications outside the classroom. This project achieves not only that goal but it also nurtures curiosity.

"It's human nature to know more about yourself so you can develop a greater appreciation of the world," he said. "And to learn more about an individual family is very exciting."

The world has come to respect the value of DNA, which only 17 years ago was rejected as evidence by the O.J. Simpson jury, he said.

Many people are now aware of how DNA works and appreciate DNA science in areas like forensics, paternity and in understanding genetic factors in deciding birth risks.

Susan Quatrella, science education specialist at Education Connection, said that while some schools can offer their students sophisticated science projects, many cannot .This project is doable for all students and staff while meeting the standards the state set for the Connecticut Academic Performance Test in science that will be administered for the first time in April.

She said DNA work is at the core of so many forensic and biotechnology fields that it should be learned, but this project offers more than that.

"This project provides a chance to see how we've come to populate the Earth," Quatrella said. "It's really exciting that they can be part of it. This is one of those perfect applications. It's so relevant and engaging."

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For more information about the project, visit http://www.nationalgeographic.com/genographic.

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