

The Harlem DNA Lab opens

Bringing CSHL's educational vision to nation's largest public school system



The students shown in this story — 30 recent immigrants to the U.S, all well on their way to mastering English — are from Brooklyn International H.S. This was their first chance to extract and analyze their own mitochondrial DNA. Their countries of origin: Yemen, Tibet, China, Haiti, Guinea, Congo, Dominican Republic, Nepal, Bangladesh, Mexico.

Last fall, at the very beginning of the 2008–09 school year, the ribbon was cut on a gleaming new Harlem DNA Lab. The facility, full of state-of-the-art equipment, occupies a 1,200-square-foot former graphics workshop in the John S. Roberts Educational Complex, the site of a junior high school on First Avenue at 120th Street in Manhattan. For CSHL, the Harlem Lab is the most vivid fulfillment to date of a democratic vision of science education articulated by David Micklos and others at the Laboratory over the last 20 years:

We envision a day when all elementary students are exposed to principles of genetics and disease risk; when all high school students have the opportunity to do hands-on experiments with DNA; and when all families have access to genetic information they need to make informed healthcare choices.

Since 1988, over 325,000 school children, parents and teachers have visited the Dolan DNA Learning Center (DNALC), located in the town of Cold Spring Harbor, while some 8,000 additional teachers have received training at DNALC workshops conducted in 42 states and several foreign countries. All have experienced the thrill of performing simple yet impressive experiments with DNA — often their own, extracted and amplified using methods that genome scientists employ daily in laboratories worldwide.





In his remarks at the Harlem Lab's opening, Dr. Bruce Stillman, CSHL president, explained the importance of this aspect of CSHL's educational mission, which, in its other phases, addresses the needs of undergraduates, graduates, postgraduates, and the professional education of practicing scientists.

"Biology is happening right now, and shouldn't be taught as a chapter of a history book," he said. "It's perhaps the fastest moving field of scientific research,

and will be a prime factor influencing improvements in healthcare in our immediate and more distant future. It's also a formidable factor shaping our nation's economy. In view of this, we at CSHL have an obligation to bring the latest knowledge and cutting-edge tools and techniques in modern biology to the students of New York City, who number over a million — the largest body of public school students in the United States."



A busy first year

In its first two terms of operation, the Harlem DNA Lab already has hosted some 1,800 visiting students, spanning grades 6 through 12, most of whom come with their classes to conduct carefully planned half-day laboratory experiments. Four-fifths of these students attend schools serving predominantly minority neighborhoods, most of which lack lab equipment needed to perform comparatively sophisticated experiments involving DNA extraction and analysis. A collaboration of CSHL and the New York Department of Education, the Harlem Lab is supported by generous grants from HHMI, The Dana Foundation, Jerome L. Greene Foundation, The Goldman Sachs Foundation and William Townsend Porter Foundation.

A teacher's story

Sometimes life brings you full circle. I'm the daughter of a Puerto Rican mother and a Cuban father. I was born in Spanish Harlem and grew up on 116th Street, right around the corner from this school — these are students I can really relate to.



I have a love for biology that goes back to the summer of my 11th year, when my family moved to an old house in the South Bronx. On one of my exploratory trips to our dark basement I found a yellow tin locker with a small light microscope inside. I observed my first paramecia and other swirling organisms through that instrument, which set me on a course that led eventually to a Ph.D. in molecular biology and the beginnings of a career in research. My love for teaching brought me back to the South Bronx, where I taught for seven years, and later to a wonderful charter high school in upper Manhattan, whose students remind me of those visiting the Lab today. In this group alone we have students from 10 countries, many of them recent immigrants.

These students are from the Brooklyn International School. And the lab we're doing is a kind of metaphor for the concept behind The Harlem DNA Lab and the program that David Micklos has created over many years. The first thing we do, literally, is take the biology out of the textbook. We're all doing the same experiment together. And, as you can see, these 11th graders are immediately immersed. Their teachers have prepared them well. There is no training period; I talk them through the lab. It's all hands-on, and, after a little shyness at the very beginning, the kids plunge in — they're swimming in the deep water.

In today's lab, they're extracting a sample of their own mitochondrial DNA (mtDNA) and preparing it for analysis. This lab shows them one way in which each of us is different — each gets to see point mutations in their mtDNA that distinguishes them from their classmates. But this lab also shows them that in the final analysis, we are more alike than different. I help them put that personal discovery in the context of the current scientific debate over human origins. The exercise is partly about the scientific method and the role of evidence. But what's most touching to me is seeing kids have the same reaction I did as a kid — they see the lab equipment and are immediately drawn to it. Even when the work is done, they don't want to leave the lab!



"The nice thing about having this lab in Harlem is that it's open to everyone. This program shows that all kids can profit from this experience, not just the honors students. More and more graduates are coming back to me and saying, 'Hey, it all began in your class.'"

— Kathleen Rucker
Brooklyn International High School

— Ileana Rios, Ph.D.
Science Educator, Harlem DNA Lab