Hugo Barrera-Saldaña

Single-minded molecular biologist Hugo Barrera-Saldaña learned first-world science in US and European labs but brought their lessons back to his homeland. He spoke in Cancun of his passion for science, his limitless ambition and his “mission” in Mexico.

There are many routes to a Ph.D. For Hugo Barrera-Saldaña, it involved begging a lift across the Mexican border into Texas, knocking on the door of geneticist Grady Saunders and offering, in halting English, to work for free. “He was 19 years old,” recalls Saunders. “I don’t know why he was so ambitious.”

As a budding biologist in Mexico, where scientists struggle for both recognition and funding, fierce ambition and hard work have been Barrera’s ticket to success. He leapt from a small-town university in which only a handful of teachers had a postgraduate qualification, to the University of Texas in Austin, to a prestigious postdoctoral position in France—then returned to Mexico in 1984 to take up a position in the biochemistry department, quickly rising to become its chair.

Ever determined that his home country should not fall behind in genetics, Barrera has in the last four years built up the Center for Biotechnological Genomics (CBI) in Reynosa, the first biotechnology institute in northeast Mexico. The center’s location—a 15-minute drive from the US border—means researchers can nip across to pick up lab supplies that would otherwise melt in the mail. “It’s one of the main advantages,” says Mario Rodriguez, Barrera’s friend and colleague at the CBI. “He’s very smart.”

Barrera may be smart, but he also works like a fiend. His parents—a farmer and grocery-store worker in a small town called Miguel Alemán—drilled competitiveness into him from an early age. “We have the idea that education can transform us,” Barrera explained during siesta-time in sweltering Cancun, southern Mexico.

As it is for many curious kids, it was a science-fiction TV show—mute episodes of *Lost in Space* picked up from stray US broadcasts—that convinced Barrera he wanted to be a scientist. When he finally encountered Watson and Crick in secondary school and molecular biology at university, his conviction deepened. “I was very much in love with DNA,” he says. “I wanted to be a biochemist.”

In pursuit of that goal, Barrera has tackled obstacles few first-world researchers can imagine. When Barrera was trying to secure his Ph.D., for example, the University of Texas graduate studies program “was not very amenable to picking Mexicans” because they were known for their poor education, says Saunders. Barrera proved his worth by doing a crash course in English while working in the lab and sleeping on his sister’s couch. Saunders was persuaded to write him a letter of recommendation, and in 1979 Barrera became the university’s first Mexican graduate student.

Barrera enthusiastically recalls the top-notch science and facilities: the medical center seemed vast; the libraries a gold mine. “It was like going to another planet,” he says. Slaking his thirst for modern biology, he learned sequencing and cloning techniques while characterizing genes for human growth hormone and placental lactogen hormone. During subsequent postdoctoral research in Pierre Chambon’s lab in Strasbourg, he tackled the genetic control elements of the SV40 virus.

With a string of papers under his belt, Barrera was primed for a

scientific career in the US or Europe. He instead headed straight back to Mexico at the tender age of 27, becoming one of the first molecular biologists at the Autonomous University of Nuevo Leon in Monterrey. Barrera says he felt obliged to offer the next generation of students the benefits of his science education. “I returned because I felt I had a mission here,” he says.

Since then, his lab has attracted a stream of eager students. Driven by Barrera’s high expectations, at least 11 have launched national and international scientific careers. In one incident, Barrera invited Tom Caskey of Baylor College of Medicine to Mexico and fed him tequila as part of a concerted campaign to persuade Caskey to take on a student.

With education so high a priority, Barrera’s bench research has taken a back seat. This is the rule in Mexico, explains Jose Maria Cantu, a geneticist at the University of Guadalajara, where funding invariably slips below government priorities such as education and health. Mexico devotes around 0.4% of its gross domestic product to research and development, compared with 2–3% in the US. The few Mexican genetics labs also

“It was always my idea to come back and change Monterrey ... I returned because I felt I had a mission here.”

feel obliged to offer health services such as clinical genetic testing. “You have to be versatile,” Cantu says.

Barrera has done his part to ensure that first-world molecular biology finds applications in Mexico. He and his colleagues launched Mexico’s first genetic screening center in 1990, and began the first gene therapy trial a few years later. At the new, marble-laden CBI, researchers have shown how to propagate agave plants—the source of tequila—from cuttings, and use DNA fingerprinting to help cattle and fish breeders improve their stock.

Indeed, rather than complain about the difficulties of conducting Mexican science, Barrera says he has chosen to lead by example. From 1995 to 1997, when he chaired the grants committee for the Mexican National Council of Science and Technology’s health sciences division, he rebalanced the grant award system so that young researchers and nontraditional institutions were more likely to receive awards.

Looking to the future, Barrera has a few modest plans: to contribute more to science in the rest of Latin America and to build a third research center and perhaps a biotechnology enterprise. But with some of his aims now accomplished, he also recognizes the need to temper his sky-high expectations. “I’ve challenged and pushed my students and collaborators to their limits,” he admits. “But sometimes I forgot to ask if they were happy.”

Helen Pearson, Cancun