Beyond DNA: The rest of the story

The availability of a fully sequenced human genome and genome-wide analyses of genetic variation have made DNA-based ancestry tests possible. These consumer DNA tests are now widely marketed as a way to discover or confirm family history. But what do they really tell us about our past, and what do they leave out? We asked young scientists to tell us about their family traditions, stories, and culture, and how they understood their DNA test results in the context of their lived experiences. Their stories are below.

To read more reflections by young scientists, find past NextGen Voices pieces at https://science.sciencemag.org/collection/nextgen-voices. Follow NextGen Voices on Twitter with hashtag #NextGenSci. —Jennifer Sills

A taste of Caribbean Christmas

My family comes from Jamaica and the Virgin Islands. There is no meal I would rather have than my mom’s home-cooked traditional Jamaican food. Now living in Florida, my mom grows many fruits and vegetables native to Jamaica in a garden that occupies her entire yard. When I visit, we spend most of our time together outside picking fresh mangoes, ackee (a tropical fruit grown in Jamaica), or whatever else happens to be in season. On Christmas, she makes oxtail (a kind of beef stew, my personal favorite), fried dumplings, and ackee with saltfish (its traditional complement of salted cod). These foods are well-spiced—although not always spicy—and flavorful.

Where my family originated is mostly hearsay, and the full history beyond a few generations is hard to trace. My DNA test results confirmed that we have some background in Europe and likely moved to the Caribbean through the slave trade. The
couplets (two lines of poetry with the same number of words) that are painted along with intricate designs on red paper, and we put red lanterns and red candles on display throughout the house; the decorations symbolize happiness and protect us from the mythical monster named Nian, who is said to be afraid of the color red. While we wait for the New Year to arrive, we listen to Hebei Bangzi, the local opera, which sounds similar to the Beijing opera but is more difficult for people outside Hebei province to understand because the singers use pronunciations unique to the region. In my hometown (Shijiazhuang, Hebei), people of the same surname gather together to extend best wishes to their elders before the first sunrise of the new year.

Such traditions are a reminder that my surname (Ji) is not common in China. I hoped that finding out more about my family’s origins would help to explain my unusual name. My DNA test results told me that 46.34% of my genome came from North China (Han), 20.13% from South China (Han), and 12.21% from Northeast Asia (Japan). I was disappointed that the results contained no detailed information that I found useful. I do not know how many Chinese people have a genetic pattern similar to mine, and—unlike scientific research—the company did not give me the raw data of my genome. Without more information about how the company analyzed my genomic data, I don’t know what conclusions I can draw or even whether I should believe the test results.

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A scary Kiwi Mardi Gras

Fifteen years ago, I probably would have said that my family didn’t have a French cultural identity, despite being raised in France. Today, after having been expatriated 10 years in New Zealand, I can confirm that we have a strong French cultural identity, especially when it comes to food. Yet, after we returned to France 3 years ago, our attachment to our home country and its culture and traditions did not feel quite the same. I believe that we unintentionally took bits of New Zealand back to France with us.

Our ever-evolving celebration of Mardi Gras encapsulates our cultural journey. Before our move, we had always celebrated the French holiday in its traditional (if less religious) form. Around the end of February, we would make and eat loads of French crêpes, and kids would dress up in festive costumes and attend the carnival. After our move, we discovered that New Zealanders do not observe Mardi Gras, so we adopted a different yet similar tradition, which was brought to the country from overseas and stuck: Halloween. Every year on the 31st of October, my eldest boy dressed up in a scary costume. But because good food is so deeply rooted in our culture, Halloween candy didn’t feel sufficient. To supplement the prepackaged treats, we created our own tradition of the Halloween “scary lunch.” Each year, I would prepare a lunch box filled with funny and scary little monsters, skeletons, and ghosts made of pancakes, carved fruits, and (for the mummies) baked sausages in pastry strings.

Now back in France, we have resumed our celebration of Mardi Gras in February. The kids dress up for school and for carnivals, just like Halloween, but with an emphasis on festive instead of scary, and we make crêpes, as we’ve done in the past. We’ve also kept our own multicultural family traditions. To adapt our New Zealand Halloween lunches, we now have a Halloween-themed French dinner in October. We’ve also updated the tradition of hiding a fève (trinket) in our galette des rois (king cake) by using a koru necklace (a traditional kiwi artifact) instead.

A poetic Han Spring Festival

My family is Han, the largest nationality of China. Like most families in China, we celebrate the Spring Festival (Chinese New Year) by gathering together to make and eat jiaozi (dumplings filled with vegetables and meat), which are shaped like ancient Chinese gold ingots to symbolize wealth. We hang festival
Our unique and changing traditions showed me that we could be open to incorporating new values and ideas when we learned the results of our DNA tests. My husband and I are both researchers in ecology and environmental genetics, manipulating DNA data daily and studying insect population genetics. It seemed only natural that we would want to see our own DNA test results. We originally thought that the genetic admixture might be quite high within our family home given that we were born 12,000 km apart—I grew up in northern France, and he was raised on the French island of La Réunion in the Indian Ocean. We were quite surprised by the results. For instance, I learned that I had ancestors from Italy and Scandinavia but very little French or Western European lineage, whereas my husband, despite being born in the Southern Hemisphere, has more Western European lineage than I do. (His results could perhaps be explained by the fact that half of the first settlers in La Réunion were from Brittany.) Although my husband has ancestors in many parts of the world where I do not (such as India, Africa, and Indonesia), we share an unexpectedly high rate of ancestry from the Iberian Peninsula (Spain and Portugal). The results have not changed our lives, but it is interesting to know that, genetically, we are more an Iberian family than a French one! We now want to travel to and discover more about the culture of these southwestern parts of Europe and pass on this heritage to our children. As ecologists, we are curious about the natural and geological histories of the Iberian region, but we would make food an important part of the trip as well. They may not have French crêpes in Portugal, but I have heard that the delicious bolo lêvedo (Portuguese muffins) are not to be missed.

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### A Bengali Thanksgiving

I’ve always struggled with being identified as simply “Indian.” My name reflects my Indian heritage better than I do, as a Montreal-born, New York City native living in Louisiana. No DNA test could reflect the mix of American and Indian cultural practices that my family has created. Take, for example, American Thanksgiving, which my family co-opted when I was young and combined with a traditional West Bengali feast. At our table, we served the turkey alongside traditional Indian luchi (oil-fried puffed dough) and fusion dishes such as vegetarian shepherd’s pie with Indian spices. Because my birthday falls near Thanksgiving, the meal was often followed by a turkey-shaped ice cream cake, Indian sweets like jalebi (a bright orange pretzel of fried sweet dough), gulab jamun (fried syrupy-sweet milk balls), and a spiced tea. We did adhere to the American tradition of overstuffing ourselves with food.

During the holiday, we listened to Bollywood pop, with high-pitched Indian women singing in Hindi or Bengali. Later in the season, my father would mix in some Nat King Cole or Frank Sinatra, or we would play an album from jazz pianist Vince Guaraldi. Being in Queens, I would always play “Christmas in Hollis” by the Queens-native hip-hop group Run DMC. My parents enjoyed it about as much as I did their Bollywood music, which is to say, not much.

In December, the large extended family of cousins, uncles, and aunts (all with a different honorific based on their birth position relative to my parents) would come over, each removing their shoes at the door out of respect. The men, in sweaters and ties, played bridge cross-legged in a corner on the floor. The women, in saris and their finest gold necklaces and earrings (gaudier than any of the jewelry worn by the hip-hop artists I worshiped), congregated in the dining area, where they teased each other, told stories in Bengali, and prepared meals. Food was served constantly from the moment the first guests arrived until they left. The smell of food cooking, mostly oil and spices, radiated and permeated through every fabric of the house. Chatter, the sounds of food frying, and playful arguing filled every room with noise. Our home was festively decorated; Santa Claus had equal billing with Durga, Kali, and Ganesh.

The kids watched American football or challenged each other to an Indian game called carrom, which is similar to billiards but played on a flat smooth table on the floor. Players use their fingers to flick flat wooden discs into different corner pockets. We would play different tournament styles and use a mix of Bengali and English to taunt and tease each other over missed shots or “lucky” wins.

Before our current chapter as Americans, my family’s Indian past stretches back to time immemorial, but India has a complicated history of invasions and rule. I hoped a DNA test would help clarify some ancestry questions. I wanted the results to say 25% Genghis Khan, 25% Gandhi, 25% Alexander the Great, and 25% unknown. What I got was 64% Central Asian, 30% South Asian, 3% Eastern European, 2% Southeast Asian, and 1% Siberian. So, I could claim Genghis, Gandhi, and Alexander! But of course, not really. I wondered when and where the mingling started.

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of my different geographic ancestors took place and if the results were more a reflection of the current genetic reference populations in those areas. The DNA results didn’t make me feel differently about my identity, and they were not as interesting as the results I received from a genetic profile that revealed an inversion in one of my chromosomes. That genetic result made me realize how hardy our genomes are and how similar we are as humans; even the 1% or so that makes each of us unique is almost meaningless when considering the bigger picture.

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A musical Colombian Novena

Born in South America, I identify as Latina and have always been aware of my mixed ethnicity. My family’s celebration of Christmas and Novena (the previous 9 days, an important observance in Colombia) exemplifies our love of food, music, and dance. During the first 8 days, family and friends meet at different houses to share deep-fried cheesy dough and sweets. On Christmas day and the morning after, we eat homemade Colombian tamales wrapped in plantain leaves and boiled for hours, and we drink hot chocolate—first adding salty cheese to the mugs and eating it with a spoon once it has melted (a delicacy unique to Bogotá, Colombia’s capital). Sometimes we also eat cheese arepas (flat corn bread) and almajabanas (cheese bread of Spanish-Arab origin). Meanwhile, my mum prepares about 20 liters of her famous ajiaco, a traditional soup from the Bogota plateau. She uses three kinds of potatoes (one of them endemic to the Northern Andes), guascas (Galinsoga parviflora), corn, chicken, capers, and cream. Toward the end of the day, the whole family gathers for a bowl of ajiaco. We admire our araucaria tree, decorated with lights and ornaments, and the creatively assembled nativity scene (often including llamas, lions, jaguars, and the occasional dinosaur) while waiting for midnight to come.

My family seems to carry music in our blood. There is always a moment when my uncle plays the guitar and everyone else joins in with percussion and voices, singing the melodies of cumbia, vallenato, and bambuco—musical styles incorporating strings and accordions from Europe, wind instruments from Indigenous communities, and African drums. The upbeat tunes belie the bittersweet themes in the Spanish lyrics. Soon, everyone is dancing to the energetic, fast-moving rhythms of cumbia, salsa, and merengue. Salsa originated with the Latin and Afro-Latin son cubano and jazz musicians from the Bronx in the United States. The music later made its way to Colombia, where it developed into something new, incorporating cumbia and vallenato elements and a faster dancing style.

I took a DNA test because I work in the fields of population genomics and phylogenomics and thought it would be fun to see my own genome sequences. Half of the sites sequenced on my genome were assigned to populations in Spain, Morocco, and West Africa; the other half to Native American populations. The results were not a surprise, but they encouraged me to dig deeper into my family’s history. I wish I could learn about and celebrate the Native American traditions of my ancestors, but most were never documented and are now lost. Important traditions are kept in the Amazon regions, such as “chontaduro dancing,” where communities share the chontaduro fruit (from the Bactris gasipaes palm) and drinks to celebrate abundance and usher in a good fishing season. Traditions around the cassava, planting seasons, and hunting also still take place, but because I grew up in the city, I don’t feel personally connected to them. I do take pride in using the words from Quechua, Muisca, and even Arabic languages that have been assimilated into Colombian Spanish.

We knew my grandfather was “Indigenous from the south” (as the government labeled him back in the day), but the DNA test results suggest that our Indigenous ancestry could have been more recent and likely than we thought. I found the test interesting; I received a set of raw data that I can analyze myself, and the results brought my father and me together in a quest for the documents and stories surrounding my family.

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