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THE DNA AGE

My Genome, Myself: Seeking Clues in DNA

By AMY HARMON

The exploration of the human genome has long been relegated to elite scientists in research laboratories. But that is about to change. An infant industry is capitalizing on the plunging cost of genetic testing technology to offer any individual unprecedented — and unmediated — entree to their own DNA.

For as little as $1,000 and a saliva sample, customers will be able to learn what is known so far about how the billions of bits in their biological code shape who they are. Three companies have already announced plans to market such services, one yesterday.

Offered the chance to be among the early testers, I agreed, but not without reservations. What if I learned I was likely to die young? Or that I might have passed on a rogue gene to my daughter? And more pragmatically, what if an insurance company or an employer used such information against me in the future?

But three weeks later, I was already somewhat addicted to the daily communion with my genes. (Recurring note to self: was this addiction genetic?)

For example, my hands hurt the other day. So naturally, I checked my DNA.

Was this the first sign that I had inherited the arthritis that gnarled my paternal grandmother's hard-working fingers? Logging onto my account at 23andMe, the start-up company that is now my genetic custodian, I typed my search into the "Genome Explorer" and hit return. I was, in essence, Googling my own DNA.

I had spent hours every day doing just that as new studies linking bits of DNA to diseases and aspects of appearance, temperament and behavior came out on an almost daily basis. At times, surfing my genome induced the same shock of recognition that comes when accidentally catching a glimpse of oneself in the mirror.

I had refused to drink milk growing up. Now, it turns out my DNA is devoid of the mutation that eases the digestion of milk after infancy, which became common in Europeans after the domestication of cows.

But it could also make me question my presumptions about myself. Apparently I lack the predisposition for good verbal memory, although I had always prided myself on my ability to recall quotations. Should I be recording more of my interviews? No, I decided; I remember what people say. DNA is not definitive.

I don't like brussels sprouts. Who knew it was genetic? But I have the snippet of DNA that gives me the ability to taste a compound that makes many vegetables taste bitter. I differ from people who are blind to bitter taste — who actually like brussels sprouts — by a single spelling change in our four-letter genetic alphabet: somewhere on human chromosome 7, I have a G where they have a C.

It is one of roughly 10 million tiny differences, known as single nucleotide polymorphisms, or SNPs (pronounced "snips") scattered across the 23 pairs of human chromosomes from which 23andMe takes its name. The company generated a list of my "genotypes" — AC's, CC's, CT's and so forth, based on which versions of every SNP I have on my collection of chromosome pairs.

For instance, I tragically lack the predisposition to eat fatty foods and not gain weight. But people who, like me, are GG at the SNP known to geneticists as rs3751812 are 6.3 pounds lighter, on average, than the AA's. Thanks, rs3751812!

And if an early finding is to be believed, my GG at rs6602024 mean that I am an additional 10 pounds lighter than those whose genetic Boggle served up a different spelling. Good news, except that now I have only my slothful ways to blame for my inability to fit into my old jeans.

And although there is great controversy about the role that genes play in shaping intelligence, it was hard to resist looking up the SNPs that have been linked — however tenuously — to I.Q. Three went in my favor, three against. But I found hope in a study that appeared last week describing a SNP strongly linked with an increase in the I.Q. of breast-fed babies.

Babies with the CC or CG form of the SNP apparently benefit from a fatty acid found only in breast milk, while those with the GG form do not. My CC genotype meant that I had been eligible for the 6-point I.Q. boost when my mother breast-fed me. And because, by the laws of genetics, my daughter had to have inherited one of my C's, she, too, would see the benefit of my having nursed her. Now where did I put those preschool applications?

I was not always so comfortable in my own genome. Before I spit into the vial, I called several major insurance companies to see if I was hurting my chances of getting coverage. They said no, but that is now, when almost no one has such information about their genetic make-up. In five years, if companies like 23andMe are at all successful, many more people presumably would. And isn't an individual's relative risk of disease precisely what insurance companies want to know?

Last month, alone in a room at 23andMe's headquarters in Mountain View, Calif., with my password for the first time, I wavered (genetic?) and walked down the hall to get lunch.

Once I looked at my results, I could never turn back. I had prepared for the worst of what I could learn this day. But what if something even worse came along tomorrow?

Some health care providers argue that the public is unprepared for such information and that it is irresponsible to provide it without an expert to help put it in context. And at times, as I worked up the courage to check on my risks of breast cancer and Alzheimer's, I could see their point.

One of the companies that plans to market personal DNA information, Navigenics, intends to provide a phone consultation with a genetic counselor along with the results. Its service would cost $2,500 and would initially provide data on 20 health conditions.

DeCODE Genetics and 23andMe will offer referrals. Although what they can tell you is limited right now, all three companies are hoping that people will be drawn by the prospect of instant updates on what is expected to be a flood of new findings.

I knew I would never be able to pass up the chance to fill in more pieces of my genetic puzzle.

But I had decided not to submit my daughter's DNA for testing — at least not yet — because I didn't want to regard anything about her as predestined. If she wants to play the piano, who cares if she lacks perfect pitch? If she wants to run the 100-meter dash, who cares if she lacks the sprinting gene? And did I really want to know — did she really want to know someday — what genes she got from which parent and which grandparent?

I, however, am not age 3. Whatever was lurking in my genes had been there my entire life. Not looking would be like rejecting some fundamental part of myself.

Compelled to know (genetic?), I breezed through the warning screens on the site. There would be no definitive information, I read, and new discoveries might reverse whatever I was told. Even if I learned that my risk for developing a disease was high, there might well be nothing to do about it, and, besides, I should not regard this as a medical diagnosis. "If, after considering these points, you still wish to view your results," the screen read, "click here."

I clicked.

Like other testers of 23andMe's service, my first impulse was to look up the bits of genetic code associated with the diseases that scare me the most.

But in the bar charts that showed good genes in green and bad ones in red, I found a perverse sense of accomplishment. My risk of breast cancer was no higher than average, as was my chance

of developing Alzheimer's. I was 23 percent less likely to get Type 2 diabetes than most people. And my chance of being paralyzed by multiple sclerosis, almost nil. I was three times more likely than the average person to get Crohn's disease, but my odds were still less than one in a hundred.

I was in remarkably good genetic health, and I hadn't even been to the gym in months!

Still, just studying my DNA had made me more acutely aware of the basic health risks we all face. I renounced my midafternoon M&M's.

And then I opened my "Gene Journal" for heart disease to find that I was 23 percent more likely than average to have a heart attack. "Healthy lifestyle choices play a major role in preventing the blockages that lead to heart attacks," it informed me.

Thanks, Gene Journal. Yet somehow even this banal advice resonated when the warning came from my own DNA.

Back in New York, I headed to the gym despite a looming story deadline and my daughter's still-unfinished preschool applications. At least I had more time. I had discovered a SNP that likely increased my life span.

But in what I have come to accept as the genomic law of averages, I soon found that I might well be sight impaired during those extra years. According to the five SNPs for macular degeneration I fed into the "Genome Explorer," I was nearly 100 times more likely to develop the disease than someone with the most favorable A-C-G-T combination.

And unlike the standard eat-right-and-exercise advice for heart health, there was not much I could do about it. Still, I found the knowledge of my potential future strangely comforting, even when it was not one I would wish for. At least my prospects for nimble fingers in old age were looking brighter. I didn't have the bad form of that arthritis SNP.

Maybe I was just typing too much.