



## MEDICINE

# YOUR PERSONAL CRYSTAL BALL

*A small sample of DNA is all it takes to find out what the future holds for your health. But do you want to know?* by EVAN RATLIFF

**I** USED TO THINK I COULD TRUST my genes. After all, I had been blessed with three decades of reliable health and a decent metabolism, despite my overindulgences and dietary neglect. But recently the bastards began to turn on me — in the form of persistent and unpleasant stomach troubles that my doctor, after a series of medical probes, diagnosed as celiac disease. A hereditary condition in which the body can't tolerate gluten (a protein found in wheats and most grains), celiac has only one treatment: a lifetime of gluten-free consumption. No bread, no pasta, no beer. No fun. So when Navigenics, a Silicon Valley biotech start-up, offered me the chance to discover what other ambushes my genes may have in store for me, I figured I'd get ahead of my next genetic betrayal.

For \$2,500 the company assesses your genetic predisposition to 18 different diseases — conditions that affect at least one in 1,000 Americans, are linked to particular genetic mutations documented in published studies, and offer some possibility of preventive action through early screening or lifestyle changes — ranging from the unpleasant (restless leg syndrome) to the terrifying (Alzheimer's).

No matter what the genetic test says, a law signed by President Bush in May makes it illegal for insurance companies to deny anyone coverage based on the results.

A few days after I registered at the Navigenics website, a blue box arrived. "Your genes offer a road map to optimal health," it declared. "Let's begin the journey." I began my journey by filling a plastic receptacle with half a shot glass full of spit and shipping off my DNA via FedEx.

A month later an e-mail popped up announcing my results. The Navigenics website offered me a final chance to retain my ignorance. Did I really want to know my genetic risk of developing incurable dementia in 40 years?

Medical researchers had cautioned that even already-identified disease genes are poorly understood. "It's one of the first times I can think of in medicine where the technology has outrun our knowledge," Dr. Eric Topol, director of Scripps Genomic Medicine

in San Diego, told me. Science is rapidly unveiling new genetic markers for diseases, yet the complex interactions among genes and between genetic mutations and environmental factors remain mysterious. Even if I have a predisposition for Alzheimer's, he said, there may be an as-yet-undiscovered repressor gene that cancels out my bad luck.

Regardless, I decided to go all in, and as the results came up on my computer, my worst fears went unrealized: My 4.4 percent risk of Alzheimer's was half the male average, my colon cancer risk was equal to the 6 percent average, and my type 2 diabetes risk was two points on the safer side. But other results were alarming. I had well over the average risk for prostate cancer, and was five times more predisposed to an intestinal affliction called Crohn's disease.

I called Shannon, my Navigenics-supplied genetic counselor, who's available 24/7 to help make sense of results. "Think of it as a tool to help you focus your attention," she said cheerfully. "It's a question of how to reduce the risk." For prostate cancer, she said, I could consider a prostate exam before the usual recommended age of 50, and start a regimen of watermelon juice, a source of lycopene, which has been shown to reduce the risk.

Dr. Muin J. Khoury, director of the National Office of Public Health Genomics at the Centers for Disease Control and Prevention, doubted my genetics results had much preventive value. "This information is suspect," he told me. Khoury feels that learning of, say, a 26 versus 17 percent projected risk of prostate cancer, given the variability of tests and rapidly changing knowledge behind the numbers, may not be enough to act on — and certainly wasn't worth \$2,500, which would have been better spent on a gym membership. Likewise, the American Medical Association opposes direct-to-consumer genetic testing, noting that "consumers may make health

decisions without understanding the complex genetic information required to interpret results."

Then again, when it comes to my health, I'm happy that I have a little extra information. When I dug deeper into my results I noticed that I'd tested negative on the major genetic indicator for, of all things, celiac disease. Shannon suggested I return to my doctor and ask whether my celiac symptoms could be attributed to early stage Crohn's disease. Not exactly trading up, but if my genes are going to sucker punch me, at least I may be able to take solace in a beer. ■

### GETTING TESTED

If you decide to get your DNA analyzed, make sure the company you choose "has transparent information about exactly what they do and how they are doing it," says Joan Scott, deputy director of the Genetics and Public Policy Center at Johns Hopkins. "And that they have someone on hand to talk to about your results." There are currently three companies offering full genome scans.

#### NAVIGENICS

\$2,500; [navigenics.com](http://navigenics.com)

#### 23ANDME

\$1,000; [23andme.com](http://23andme.com)

#### DECODE

\$985; [decodegenetics.com](http://decodegenetics.com)