

This just in: Eat your vegetables

A reporter's personal genome project

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With a swab of saliva and a swipe of a credit card, countless health-conscious consumers are paying top dollar to discover what microscopic evils lurk in their genes. Among the many mail-order DNA tests available online is a "nutrigenomic" exam, which promises -- for US\$395 -- to uncover how a person responds to certain foods. The end result, the companies claim, is a personalized diet plan tailored for you and your one-of-a-kind DNA. In the second instalment of a three-part series, National Post reporter Michael Friscolanti finds out whether his genes are the reason he's having trouble fitting into his jeans.



CREDIT: Peter Redman, National Post

Michael Friscolanti studies his personalized genetic report. The test examined 19 different genes and came up with "personal advice."

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In a few short weeks, a sliver of my DNA went from the inside of my cheek to a mailbox around the corner to a Seattle-bound plane to a small laboratory I have never seen.

There, an anonymous technician examined my saliva, searching for genetic variations that might explain why one person can eat a cheeseburger before bed and still maintain a washboard stomach, and why another person (i.e. -- me) cannot.

My genetic blueprint arrived, fittingly enough, in a blue binder. Good to see someone out there is using his creative gene.

"Michael, welcome to your personal report," the cover page said. "This report will help you to adopt the lifestyle habits and nutritional practices best suited to your individual needs. After all, if your genes belong to an 'engine' that needs unleaded gas, it's not a good idea to fill your tank with truck diesel!"

Maybe not, but it can't be much worse than what usually ends up in my "tank." Carb-filled pasta. Deep-fried cutlets. Doughnuts. More doughnuts.

I'm not ashamed to admit it. I eat too much. And I move too little. You certainly don't have to be a doctor to figure out why I'm a tad overweight.

Up until the day my results arrived in the mailbox, I treated this assignment the same way I treat my dinner: with a grain of salt. What more can my DNA possibly tell me that I can't already see in the mirror?

But as I stared at the blue binder for the first time, I was suddenly afraid to start turning the pages. I know nothing about my medical history. I was adopted as a baby and have never bothered to find out whether death-by-overeating runs in the family. What if I really am a genetically modified heart attack waiting to happen?

The test I ordered is called Cellf, a product developed by Sciona Ltd. and distributed in North America by numerous companies, including Genelex Corporation, a Washington-based firm that has been in the medical testing business for nearly 20 years.

The kit examines 19 separate genes, lumping them into various categories such as "Heart Health" genes, "Antioxidant" genes and "B Vitamin Use" genes. Some overlap, falling into more than one category. The VDR gene, for example, affects both bone health and insulin sensitivity, the company says.

It is a tad confusing, especially the detailed chart that appears near the beginning of the blue binder. But flip a few more pages and each gene is given its own lengthy explanation, including a box labelled: "Your Personal Advice."

After a few more minutes of staring, I eventually mustered the courage to read on. In a perfect world, I would discover that I have a rare genetic variation that turns bacon grease into muscle. At the very worst, the report would tell me to head straight to Taco Bell because I am already a lost cause.

"Your DNA screen has revealed a variation in your 'Detoxification' gene profile, which may prevent your detoxification systems from operating at their best," according to one of the boxes. "Your consumption of cruciferous vegetables is also very low. Adding more of these vegetables to your diet will help increase the activity of your body's detoxification systems, aiding the removal of harmful substances from your body."

The report goes on to explain that cabbage, broccoli and cauliflower contain glucosinolates, which, "according to the latest medical research, may offer protection against certain illnesses, such as cancer and heart disease."

Advice: Eat more cruciferous vegetables.

Moving on to antioxidants, the report says my "DNA screen has identified gene variations that may limit [my] body's ability to fight the effects of free radicals and to remove their harmful products."

Free radicals, of course, have been linked to arthritis, cardiovascular disease and cancer. "An adequate supply of antioxidants, which 'scavenge' or neutralize free radicals, is vital for your health," the binder says. "Your cells make their own antioxidants, but they can also draw a helpful supply of antioxidants from your diet."

Advice: Eat plenty of fruits and vegetables, and consume more Vitamin A, C and E.

"Your DNA screen has identified variations in your 'Bone Health' gene profile," the report continues. "These variations have been shown to alter normal bone maintenance when excess caffeine is consumed. Your current intake of caffeine is moderately high."

Excessive caffeine, the report says, "can be bad for bone health because it can prevent the absorption of vitamins and minerals, including the ones that build up bone, such as calcium."

Advice: Drink fewer than three cups of coffee a day, and if possible, eliminate caffeine from your diet altogether.

Three cups? I drank that many just reading the page.

"Your personal 'Body Weight' profile has identified a gene variation that has been associated with reduced insulin sensitivity," the report says, a few entries later. "Insulin sensitivity has a direct correlation to maintaining optimal body weight."

Advice: "Adopt lifestyle changes that will achieve a slow but sustainable and healthy

weight loss. Be sure to continue watching your weight."

So let's recap. In a nutshell, I should eat more fruits and vegetables, take my vitamins, drink less coffee and try to lose a few pounds.

The lab should hire my fiancée. She's been saying the same thing for years.

Somewhat confused, I phoned Ahmed El-Sohemy, a nutritional sciences professor at the University of Toronto. Among his many titles, he also holds the Canada Research Chair in Nutrigenomics. He was kind enough to take a quick look at my results.

"At the end of the day, all of the recommendations are pretty non-controversial," he said. "They profit by packaging this, or at least marketing this, as being unique to your individual genetic makeup. As we can see from much of the advice given, it's not likely to be the case. How individualized is the advice, really?"

But it is not the marketing that concerns Prof. El-Sohemy. It is the science -- or lack thereof -- that the results are based on.

For one, he takes issue with the way some of the 19 genes are grouped. Eleven -- more than half -- are considered "Heart Health" genes. Chances are pretty good, Prof. El-Sohemy said, that everyone will have at least one variation among those 11 genes.

And what does that mean? "They will make that standard recommendation," he said. "In the case of saturated fat, lower your intake. In the case of fruits and vegetables, increase it."

Prof. El-Sohemy also pointed out that scientists are still in the very early stages of deciphering what each variation means and whether those variations can be somehow compensated for through diet. Consider, for instance, the coffee recommendation, the one that said I have a variation in my VDR gene that has been shown to alter normal bone maintenance when excess caffeine is consumed.

Prof. El-Sohemy was pretty sure he knew the precise study on which the report based its recommendation. It appeared in the American Journal of Clinical Nutrition under the headline: Caffeine intake increases the rate of bone loss in elderly women.

I guess my DNA screen failed to uncover that small gender distinction.

"We need to keep in mind that nutritional science is both a discovery and an applied science," he said. "And because of the ease of application, there seems to be this rush to translate certain discoveries before they are validated."

In other words, I probably should have spent that US\$395 on a few fruit platters and some aerobics classes.

"Save your money for now," Prof. El-Sohemy said. "We're learning more each day by the research that's being done, but there are still far too few studies in these different areas, and I certainly don't feel confident enough to make recommendations to anyone based on what their genetic makeup is as of yet."

Like any good patient, I sought a second opinion.

"In these 35 pages, what you have is motivation," said Jose Ordovas, director of the Nutrition and Genomics Laboratory at Tufts University in Massachusetts. "They may be right. They may be wrong. But regardless of whether they are right or wrong, the recommendations that they give you are just common sense and do nothing wrong to you. They wake up your interest about certain things, like eating more of this and more of that. And that will be good for you."

Prof. Ordovas compared my mail-order test to his first computer. "The only thing that I could do was play Pong," he said. "I paid so much for this and the only thing that I can do is blip, blip."

So how much longer, I asked, until we have the nutrigenomic equivalent of iTunes?

"We are aiming to get things straight in the next few years," he said. "We believe in the concept. The question is that we have to provide the right recommendations based on the right research and the right protocols and experiments."

Before hanging up the telephone, Prof. Ordovas joked that he should start a side business, maybe charge \$1,000 a pop for each assessment. "A couple of those per day..." he laughed.

He would be retired in no time, sipping beers in the Caribbean. Light beers, of course.

Tomorrow: Part 3;

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