



The DNA Game

Can your genes
reveal the perfect
skin care for you?

BY SALLY WADYKA

Trying a new anti-aging cream can be a little like peering into a cloudy Magic 8 Ball: “Outlook unclear. Try again.” Yet most of us dutifully apply anything we think may help keep our skin younger looking, from antioxidants and sunscreen to Retin-A and glycolic acids. We’re swayed by promises of a skin-transforming miracle until, our

bathrooms littered with jars, tubes, and bottles, we barely even remember what we’re putting on our faces, much less why.

But buying products and hoping for the best may soon be passé. New companies are launching services that allow you to swab your cheek, send off your DNA for analysis, and get back a report detailing your skin’s

potential pitfalls—allowing you to completely personalize your approach to skin care. Find out you're at high risk of skin cancer, for example, and you could load your regimen with sunscreen and antioxidants to help prevent free radical damage, thereby decreasing your risk of skin cancer. If the test shows that your genes leave you more vulnerable to collagen degradation, you might switch to a Retin-A cream at night to help ward off premature sagging and wrinkles. It sounds almost too good to be true—so is it?

The Basics

Ever since the human genome was mapped in 2003, researchers have been busy uncovering ways in which we can benefit from this new knowledge. And outside of doctors' offices and researchers' labs, consumers are getting into the act by taking at-home tests, like the ones from the popular 23andMe, that look at all or part of one's genome and reveal any variations.

We each have 23 pairs of chromosomes. Each chromosome holds packages of DNA, which contains genes passed down from your parents and holds potential keys to everything from your hair color to your risks of certain illnesses. Within the DNA are many types of genetic variants, including one called single nucleotide polymorphisms. There are about 10 million SNPs in the human genome, and some have been found

to predict risks of diseases or have a regulatory effect on a gene's function. So by swabbing your cheek, you can—theoretically, anyway—find out what the future holds for your skin.

How the Tests Work

A quick Google search for “DNA test kits” yields dozens of results. For costs ranging from \$99 to several hundred dollars, companies will analyze hundreds of thousands of SNPs, providing you with health information, including what's related to your skin. One company, SkinShift, offers a \$299 test that analyzes just 16 SNPs, but, according to the company's founder, Ruthie Harper, MD, those SNPs pertain specifically to five skin-health factors: collagen formation, sun protection, glycation protection, antioxidant protection, and inflammation control. “These SNPs are well established, and by analyzing them, we can tell you if you are at high, medium, or low risk of each,” says Dr. Harper. Then, based on your results, the theory goes, the tester can tell you what targeted ingredients and products to use.

What the Research Says

Even though numerous strides have been made in the decade since the human genome was first sequenced, the field remains a work in progress. “We have already learned that specific genes are responsible for certain skin issues,” says Joshua Zeichner, MD, director of cosmetic and clinical

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research in dermatology at Mount Sinai Medical Center in New York City. "And countless numbers of potential gene mutations are being studied to better understand these diseases and help explain other conditions, like acne and skin aging." These so-called susceptibility variants are still being studied and identified.

But our genes can tell us only so much. "There's a widely held misconception that all genetic markers are deterministic. In other words, if you have them, you definitely have that trait or that disease," says Robert Green, MD, associate professor of medicine in the division of genetics at Brigham and Women's Hospital and

Harvard Medical School. "But while that's true for some genetic markers, many of them simply increase the probability that you will develop a certain condition, such as freckles."

When it comes to skin cancer risk, genetics experts warn that knowing your variants still will not give you enough information to make meaningful changes to your skin-care routine. For example, finding out you have a variation in the gene related to freckling and potentially melanoma can mean you have a lower risk of the disease (2.2% versus the average person's 2.9% risk). "All these results may be technically accurate, but there is still considerable concern that consumers may



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What can a DNA test reveal about your skin?

misunderstand that the ability to differentiate risk based on these variants is very, very modest," cautions Dr. Green. For example, we all need to use sunscreen regularly, and you shouldn't expect a DNA test to say otherwise.

The Risks

One of the problems with at-home testing is that it's hard for the average consumer to really know what she's getting. When you scroll through the manufacturers' slick Web sites, it's easy to believe that the results will be backed by cutting-edge research. But the recent FDA crackdown on 23andMe is a reminder that the promise of genetic testing still holds some peril. In December 2013, after the FDA ordered 23andMe to stop sales of its kits, alleging failure to prove the product's validity, the company started providing only ancestry information, not supplying customers with information on health risks. The FDA lumps these tests with other medical devices it regulates and demands a fairly high standard of proof to back up any marketing claims. And even before this recent scuffle with the FDA, critics of at-home testing sounded alarms about taking the practice of genetic testing outside the doctor's office.



The Bottom Line (For Now)

While the idea of being able to use your DNA to individualize your skin care routine is intoxicating, the jury is still out on how plausible it is to use genetic testing for this purpose. Even if accurate, the forecasts made by current tests are pretty obvious. If you have fair skin and freckles, you probably already know that you need to be extra vigilant with sunscreen. Worried about sagging? Your mom's face may be a good indicator of what yours will look like in a few years. So extend your common sense to your skin care and apply products with ingredients—such as sunscreen, Retin-A, and antioxidants—that have been proven to work. But stay tuned: Given the excitement surrounding DNA testing, it may not be long before that Magic 8 Ball reads, "It is certain." ■