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Features

Tracking the smoking gene;News

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A DNA test claims to identify the perfect quit-smoking strategy. Are there any butts, asks Ainsley Newson

With a ban on smoking in enclosed public places in England around the corner, now might be the time to kick the habit. But with so many treatments to help you quit, it can be difficult to choose -hypnosis, patches, medications, willpower? Now, however, one of the first "lifestyle" genetic tests is available, claiming to help identify exactly what approach is best for your genetic make-up, and to tailor a quit strategy to fit. It's called NicoTest.

It sounds a like godsend, but scientists are less than unanimous about its benefits. The test has raised new questions about whether our high hopes about genetic testing have started a bandwagon that is beginning to run out of control.

About two thirds of the UK's 14 million smokers want to quit, yet figures show that only 1 in 20 who stop "cold turkey" remains smoke-free a year later. The makers of NicoTest claim to be able to change all that. "The test ensures that a smoker takes the right treatment at the right dose from the outset," says Mark Tucker, the chief executive of G-Nostics, the Oxford-based company behind the Pounds 94.99 test.

NicoTest analyses two genes called DRD2 and CYP2A6. DRD2 is important because it may influence whether we become addicted to nicotine. The theory is that the pleasure we get from tobacco relates to our brain cells being receptive to a "pleasure chemical" in the brain called dopamine. The nicotine in tobacco is believed to activate dopamine receptors in the brain, causing pleasure sensations.

The DRD2 gene helps to regulate how receptive cells are to dopamine.

In some people, G-Nostics says, the gene is subtly altered, meaning that cells are less receptive to dopamine. Those people, it claims, are predisposed to being heavier smokers because they need more nicotine to get the same "reward" from smoking.

This heavily addicted group with an altered DRD2 gene may respond better to treatments that continue to feed the body nicotine -nicotine-replacement therapies, such as gum, patches or lozenges. The remaining 65 per cent of smokers who don't have this alteration may respond better to drugs that reduce the urge to smoke, such as bupropion (Zyban).

NicoTest also analyses the CYP2A6 gene because it may influence how quickly smokers clear nicotine from the body. This is useful information to know when putting together individualised quitting programmes; people who get rid of nicotine from their bodies more slowly may need lower doses of nicotinerplacement therapies and may be able to wean themselves off them quicker.

But much of this is based on conjecture. While scientists have found a handful of genes influencing nicotine addiction, research, including G-Nostic's, is still at an early stage. "It is almost certain that in 20 years' time we will have tests for 50-100 genes that help to explain why one person smokes and gets hooked and another does not," says Dr Saskia Sanderson, a research fellow in health psychology and genetics at University College London.

"But even then we still won't be able to label someone as an addict on the basis of their genes because personality and behaviour are much more complex than that," Dr Sanderson adds.

Imran Ahmed, 27, was smoking 20 cigarettes a day before taking the NicoTest six weeks ago and he has not smoked since. The test indicated that he had an altered DRD2 gene and that he would be a good candidate for nicotine replacement therapy rather than drugs, but he needed only low doses, the test found. It seems to have worked; psychologically, if nothing else.

"When I got the test result I made myself a certificate and put it on the wall next to the result. This authoritative advice has made me much more confident about quitting," he says.

But critics have expressed concern about the test, currently available only from the company's website. "It has been marketed without adequate supportive evidence," says Robert West, a professor of tobacco studies at University College London. "It is all very interesting, but not close to being something to consider as a reliable technology."

Dr Sanderson concurs: "While the principle behind the test is sound, the reality is that we're still at the research stage and it's too soon to be selling this kind of genetic test to the public."

Tucker disagrees. "I find that incredible because nothing is too soon for someone who is trying to quit smoking," he says. "Anything that helps them to find a path to quitting can't come soon enough."

He says that NicoTest is not only about genetics. "Our online support programme helps to prepare a smoker to quit and maintain a smoke-free lifestyle. Customers receive tailored cognitive behavioural advice, an 11-week course of motivational e-mail messages and access to a professionally moderated chat room."

For Linda Brown, a 36-year-old student, this structured support was one of the best parts of the test. "I really liked the online chats with other ex-smokers to give you extra support," she says. But in contrast, she found the results of the genetic test themselves rather upsetting. "I wanted to find out whether I smoked because I was an addict, or whether I just smoked because I smoked," she says.

"Unfortunately, the test showed me that I was an addict. I'm quite ashamed about that because I don't think of myself in this way."

NicoTest is just one of an ever-increasing series of commercially available "lifestyle" DNA tests. Companies such as DNA Direct, NuGenex and Sciona offer tests for anything from cardiac health to your body's ability to cope with toxins.

They then "prescribe" nutritional supplements or offer diet and lifestyle advice.

The science behind these tests, however, remains unproven and consumers should keep this in mind and be wary. "It is very important that people look at the evidence there is for a test, then go from there," Dr Sanderson says.

Controversy also rages as to whether these new lifestyle genetic tests should be on sale directly to the public or accessible only via GPs. Brown's unsettling experience may add some weight to this argument. The campaign group GeneWatch believes that the tests must be strictly regulated. "There should be an independent assessment of the claims made for genetic tests to prevent misleading marketing. In addition, tests should be provided only through medical practitioners so that they can be properly explained," says Dr Helen Wallace, GeneWatch's deputy director.

But not everyone is certain that regulation is the answer, including Dr Sanderson.

"I'm not sure that we should be making a special case for this test just because it uses genetic information about a person," she says.

She believes that your chances of success really depend on your motivation to give up in the first place. "Our research has found that people who opt for genetic testing use the test as a motivational tool, regardless of the test result itself," she says.

THE DRAG FACTOR

* One scientific review has estimated that what makes us become hooked on cigarettes is 50 per cent genetically influenced -and genes then play a further role in influencing how many we end up smoking.

* Much of the pleasure derived from smoking is believed to come from nicotine making brain cells more sensitive to the brain chemical dopamine, which induces feelings of pleasure.

* The gene CYP2A6 -which varies greatly from individual to individual -may be important in determining whether you are a smoker and what kind of smoker you are.

Some studies indicate that individuals with one common variant are less likely to become smokers, and if they do smoke, to consume fewer cigarettes every day.

* Researchers from Keio University in Tokyo believe that the gene CYP2A6 affects people's ability to break down nicotine. People with higher levels of nicotine in the blood are less likely to smoke large amounts because they don't need to keep levels topped up.

* Contact the NHS Stop Smoking Service, www.givingupsmoking.co.uk ; NicoTest, www.nicotest.com

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