

A step toward a saliva test for cancer

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A new saliva test can measure the amount of potential carcinogens stuck to a person's DNA -- interfering with the action of genes involved in health and disease -- and could lead to a commercial test to help determine risks for cancer and other diseases, scientists reported here today during the 242nd National Meeting & Exposition of the American Chemical Society (ACS).

"The test measures the amount of damaged DNA in a person's body," said Professor Hauh-Jyun Candy Chen, Ph.D., who led the research team. "This is very important because such damaged DNA — we call this 'DNA adducts' — is a biomarker that may help doctors diagnose diseases, monitor how effective a treatment is and also recommend things high-risk patients can do to reduce the chances of actually getting a disease," said Chen. The research team is at National Chung Cheng University (NCCU) in Taiwan. "We tried urine and blood and found these adducts. Then we turned our attention to saliva. It's much more convenient to collect a sample of saliva."

A DNA adduct forms when a potentially cancer-causing substance is chemically attached to a strand of DNA, which makes up [genes](#). People come into contact with such substances in the environment, certain workplaces and through everyday activities. Cigarette smoke, for instance, contains at least 20 known cancer-causing substances. When such a substance binds to DNA, it changes the DNA so that genes may not work normally. Our body has a built-in repair system that can naturally clear up such damage. If that system fails, however, a DNA adduct could lead to mutations or genetic changes that, in turn, could

lead to [cancer](#). DNA adducts also accumulate with aging and have been linked to other health problems, including inflammatory diseases and chronic brain disorders like Alzheimer's disease.

The new test measures the levels of five key DNA adducts, including some that form as a result of cigarette smoking. Traditionally, DNA for such tests had to be obtained by taking a blood sample and processing the white blood cells, which contain large amounts of the genetic material. More recently, however, scientists found that DNA samples could be obtained more conveniently from saliva. The DNA is present in white blood cells found naturally in saliva and from cells shed from the lining of the mouth. Chen uses a very sensitive laboratory instrument called a mass spectrometer to analyze for DNA adducts.

Chen envisions several uses for any potential commercial version of the test, which she said would probably cost several hundred dollars. One, for example, might be health promotion among people exposed to [carcinogens](#) due to lifestyle, occupation or other factors. Detection of high levels of DNA adducts in cigarette smokers, for instance, could encourage them to stop. Follow-up tests showing a decline in [DNA](#) adducts could reinforce their healthier lifestyle.

Provided by American Chemical Society

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