

## Scientists accurately predict age with saliva sample

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Self-conscious about your age? Careful where you spit. UCLA geneticists now can use saliva to reveal how old you are.

The June 22 advance online edition of the *Public Library of Science* (*PLoS*) *ONE* publishes the findings, which offer a myriad of potential applications. A newly patented test based on the research, for example, could offer crime-scene investigators a new forensic tool for pinpointing a suspect's <u>age</u>.

"Our approach supplies one answer to the enduring quest for reliable markers of aging," said principal investigator Dr. Eric Vilain, a professor of <u>human genetics</u>, pediatrics and urology at the David Geffen School of Medicine at UCLA. "With just a saliva sample, we can accurately predict a person's age without knowing anything else about them."

Vilain and his colleagues looked at a process called methylation – a chemical modification of one of the four building blocks that make up our DNA.

"While genes partly shape how our body ages, environmental influences also can change our DNA as we age," explained Vilain. "Methylation patterns shift as we grow older and contribute to aging-related disease."

Using saliva samples contributed by 34 pairs of identical male twins ages 21 to 55, UCLA researchers scoured the men's genomes and identified 88 sites on the DNA that strongly correlated methylation to age. They



replicated their findings in a general population of 31 men and 29 women aged 18 to 70.

Next, the scientists built a predictive model using two of the three genes with the strongest age-related linkage to methylation. When they plugged in the data from the twins' and the other group's saliva samples, they were able to correctly predict a person's age within five years – an unprecedented level of accuracy.

"Methylation's relationship with age is so strong that we can identify how old someone is by examining just two of the 3 billion building blocks that make up our genome," said first author Sven Bocklandt, a former UCLA geneticist now at Bioline.

Vilain and his team envision the test becoming a forensic tool in crimescene investigations. By analyzing the traces of <u>saliva</u> left in a tooth bite or on a coffee cup, lab experts could narrow the age of a criminal suspect to a five-year range.

In a minority of the population, methylation does not correlate with chronological age. Using this data, scientists may one day be able to calculate a person's "bio-age" -- the measurement of a person's biological age versus their chronological age.

Physicians could evaluate the risk of age-related diseases in routine medical screenings and tailor interventions based on the patient's bio-age rather than their chronological age. Instead of requiring everyone to undergo a colonoscopy at age 50, for example, physicians would recommend preventive tests according to a person's bio-age.

"Doctors could predict your medical risk for a particular disease and customize treatment based on your DNA's true biological age, as opposed to how old you are," noted Vilain. "By eliminating costly and



unnecessary tests, we could target those patients who really need them."

The UCLA team is currently exploring whether people with lower bioage live longer and suffer less disease. They also are examining if the reverse is true -- whether higher bio-age is linked to a greater rate of disease and early death.

## Provided by University of California - Los Angeles

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