

# Saliva

## A Window to Health Status

**S**itting in public is socially frowned on, unless, for example, you're sitting in the dentist's chair.

Now, you can also spit in the name of science.

That's what's being asked of a fit, 30-something-year-old male volunteer taking part in a 4-year research project called "salivary proteomics cataloging."

Scientists from the Agricultural Research Service, the University of Rochester, and Scripps Research Institute are involved in cataloging the thousands of proteins, lipids, sugars, and other molecules that make up human saliva.

The project dovetails with growing interest in using salivary proteins as a way of diagnosing diseases or detecting illegal-drug use.

ARS chemist Neil Price is researching saliva as a potential biochemical window on the body's anabolic workings—chemical means by which nutrients in food are assembled into larger molecules for growth.

"Saliva is a really good diagnostic medium because it's noninvasive and has a fast turnover; you're making salivary proteins all the time," says Price, who is with ARS's National Center for Agricultural Utilization Research, in Peoria, Illinois.

In an approach called "nutritional diagnostics," saliva could also be used to evaluate how an individual's metabolism responds to a particular food or supplement. Either could be adjusted accordingly to improve health.

Of particular interest is measuring the rate at which the body metabolizes fructose, glucose, and other simple sugars in food and parcels them out as building blocks for salivary components, especially mucins and other glycoproteins. Price and ARS chemist Suzie Sheng are using mass-spectrometry analysis to compare the ratio of carbon 12 and 13 isotopes of sugars that have been metabolized and secreted into saliva.

"We aim to develop a model for how metabolism changes in response to exercise, dieting, or dietary supplements," says Price. "If we know what happens in a healthy individual, and how that can change, then we might be able to explain what it means to 'feel healthy' in a measurable way."

Such information could also prove useful in assessing changes in health brought on by use of "prebiotics"—carbohydrates that nourish growth of beneficial gut bacteria. Price and colleagues envision being able to count populations of good microbes based on the metabolism of oligosaccharides—sugars from corn and other crops that are linked to bacterial growth and activity in the colon. This research is in keeping with the ARS center's goal of expanding markets for corn, soybeans, and other crops.

"We hope this will lead to improved food products for human health and, ultimately, create new markets for agriculture-based carbohydrates," says Price.—By **Jan Suszkiw**, ARS.

*This research is part of Quality and Utilization of Agricultural Products, an ARS National Program (#306) described on the World Wide Web at [www.nps.ars.usda.gov](http://www.nps.ars.usda.gov).*

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