

Taking a Closer Look at Plaque

ScienceDaily (Oct. 22, 2010) — A team of University of Rochester scientists is using the technique of Raman spectroscopy to study two common dental plaque bacteria, *Streptococcus sanguis* and *mutans*. The relative balance of the two may be an indicator of a patient's oral health and risk for tooth decay -- *Streptococcus sanguis* is associated with "healthy" plaque, while *mutans* is associated with tooth decay.

Raman spectroscopy offers the potential to analyze samples of the bacterium in a simple, rapid and quantitative manner as compared to microbiology techniques, including the ability to study spatial distributions of bacterial species, living or dead, within samples.

"We're using Raman spectroscopy to study these oral bacterial biofilms, essentially observing how two species scatter light into shifted wavelengths in a unique way. We can then use these characteristic spectra to identify 'unknown' samples of these species," says Brooke Beier, a Ph.D. candidate at the University of Rochester's Institute of Optics. "Studying the spatial distributions of the good vs. bad bacteria under various growth conditions may help scientists determine more effective treatments to prevent tooth decay."

With the ability to identify biofilm samples by species, the researchers can now move on to the study of biofilms grown from a mixture of liquid cultures, where the two species may interact as they grow together.

The talk, "Confocal Raman Microspectroscopy of *Streptococcus sanguis* and *mutans*," takes place on Oct. 26 at the Frontiers in Optics (FiO) 2010/Laser Science XXVI -- the 94th annual meeting of the Optical Society (OSA), which is being held together with the annual meeting of the American Physical Society (APS) Division of Laser Science at the Rochester Riverside Convention Center in Rochester, N.Y., from Oct. 24-28.

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