

Researchers identify new dental cavity-causing species

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A team of scientists from Boston has confirmed that the bacterium *Streptococcus mutans* is a primary culprit in early childhood caries (EEC) cavities on the first set of teeth, and has identified a new species of bacterium, *Scardovia wiggsiae*, which they suspect is also a major contributor. They report their findings in the *Journal of Clinical Microbiology*.

The study's ultimate goal was to determine which bacterial species should be suppressed "to prevent cavity formation," says Anne Tanner, of the Forsyth Institute, Cambridge, MA. EEC is the most common chronic infectious disease of childhood in the US. It afflicts one quarter of the relevant population, and more than one half among certain disadvantaged socioeconomic groups.

In this study, the researchers compared the bacterial populations in samples of dental plaque taken from deep cavities in afflicted children, with plaque from matched sites in cavity-free children. They identified species using 16S ribosomal RNA (16S rRNA). Ribosomes are the machinery that translate the genetic code into protein, and 16S rRNA differs among species. Since high acidity causes caries, and since only acid tolerant bacteria can survive in levels of acidity associated with active caries, they cultured bacteria under acidic conditions to select for species likely to play important roles in cariogenesis.

"We detected the major caries pathogen of childhood caries, *S. mutans*, in many of the children with advanced caries," says Tanner. In addition,

they found the new species, *S. wiggisiae*, in a high proportion of plaque samples from cavities, including in several such samples from which *S. mutans* was absent. *S. wiggisiae* can tolerate the level of acidity in active caries, leading the team to speculate that it causes [cavities](#).

Over and above normal dental care, measures to suppress cariogenic bacteria include mouth rinses such as chlorhexidine, Povidine iodine, fluoride, and the use of sugar substitutes, says Tanner. "By removing a primary sugar carbohydrate from the diet, the more cariogenic bacteria would make less acid, and might no longer be able to outcompete non-cariogenic plaque bacteria." Managing very young children for severe caries is difficult, and they are often treated under general anaesthesia.

More information: A.C.R. Tanner, et al., 2011. Cultivable anaerobic microbiota of severe early childhood caries. *J. Clin. Microbiol.* 49:1464-1474

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