

New understanding of chronic otitis media may inform future treatment

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In most children with chronic otitis media, biofilms laden with *Haemophilus influenzae* cling to the adenoids, while among a similar population suffering from obstructive sleep apnea, that pathogen is usually absent, according to a paper in the April 2011 *Journal of Clinical Microbiology*. This has major implications for treatment of chronic otitis media.

For one thing, biofilms are notoriously resistant to [antibiotics](#). Earlier clinical studies had suggested that [adenoids](#) might be reservoirs for middle ear pathogens, and a 1987 study had suggested that adenoidectomy was effective in treating children prone to middle ear infections. Then, in 2006, Luanne Hall-Stoodley of the Wellcome Trust Clinical Research Facility, Southampton, UK, et al. showed in children undergoing installation of tympanostomy tubes for treatment of chronic otitis media that the culprit bacteria inhabited biofilms attached to the middle ear [mucosa](#), along with other bacteria that cause ear infections. “We therefore wondered if these pathogens might also form biofilms on the adenoid surface,” says Hall-Stoodley.

To that end, this team of academic and clinical investigators used a device called the PlexID that can detect a broad range of bacteria in a clinical sample, and then used PCR and fluorescence in situ hybridization (FISH) probes to corroborate the presence of middle ear pathogens in the biofilms. That work fingered *H. influenzae* as the major culprit. “Clinically, our data explain why adenoidectomy helps with otitis media effusion since it removes a reservoir of pathogenic [bacteria](#) in the

upper respiratory tract that can lead to otitis media,” says Hall-Stoodley. That doesn’t necessarily mean that clinicians will automatically recommend adenoidectomy as the primary surgical treatment, she adds. Nonetheless, “We are convinced that *H. influenzae* is a uniquely important pathogen in chronic otitis media,” she says.

“I think that scientists have begun to think about chronic otitis media in a new way, and investigation of the pathogenesis of this complex disease will help in the design of novel therapies that do not depend on antibiotic treatment alone,” says Hall-Stoodley. “Chronic middle ear infection can cause hearing impairment, which can affect verbal ability and education in children.”

Hall-Stoodley notes that the use of bacterial culture to try to understand complex diseases such as otitis media has failed to provide a “complete understanding of the microbial complexity—the microbiome—that may be present in the nasopharynx,” and that culture alone can no longer be the gold standard for identification of [pathogens](#).

More information: L. Nistico, et al. , 2011. Adenoid reservoir for pathogenic biofilm bacteria. *J. Clin. Microbiol.* 49:1411-1420.

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