

## **Tips from the Journals of the American Society for Microbiology**

EurekAlert

### **Unhealthy Patterns of Innate Oral Bacteria May Cause Bad Breath**

It might not just be poor oral hygiene causing that bad breath say researchers from Japan. Unhealthy patterns of bacterial populations inherent to the mouth may also contribute to oral malodor. They report their findings in the May 2010 issue of the journal *Applied and Environmental Microbiology*.

Second only to cavities and gum disease, bad breath is a major complaint made by patients visiting the dentist. Poor oral hygiene resulting in bacterial overgrowth is a known cause of bad breath and while treatment with antibacterials generally provides short-term relief, the malodor-causing bacteria quickly return. Bacteria attributed to bad breath are considered members, not imposters, of the oral microbial ecosystem suggesting that an overall shift in the structure of bacterial populations may be necessary to completely cure bad breath.

"Adjusting the global composition of indigenous bacterial populations toward a 'healthy' pattern may be an alternative approach to effectively prevent oral malodor," say the researchers.

Bacterial populations in saliva samples collected from 240 patients complaining of bad breath were analyzed and divided into groups based on similar patterns. These patterns were then further explored in those exhibiting varying intensity levels of bad breath. One group displayed noticeably lower levels of volatile sulfur compounds (a major contributor to bad breath), while also showing higher proportions of bacterial populations indicating a possible correlation between the structure of innate bacterial populations and bad breath.

"The results of this investigation clearly demonstrate that oral malodor is a symptom based on the characteristic occupation of indigenous oral bacterial populations, rather than solely on bacterial overgrowth due to poor oral hygiene," say the researchers. "The observation of oral bacterial populations from a broad ecological view may provide novel insights into human health and other disorders within the oral cavity."

(T. Takeshita, N. Suzuki, Y. Shimazaki, M. Yoneda, T. Hirofuji, Y. Yamashita. 2010. Relationship between oral malodor and the global composition of indigenous bacterial populations in saliva. *Applied and Environmental Microbiology*, 76. 9: 2806-2814.)

## **Temperature and Humidity May Effect Virus Survival on Surfaces**

The SARS coronavirus (CoV) may survive on surfaces for days at temperature and humidity levels common to indoor environments say researchers from the University of North Carolina at Chapel Hill. They report their findings in the May 2010 issue of the journal *Applied and Environmental Microbiology*.

During the worldwide outbreak of SARS-CoV in 2003 hospital surfaces were examined for their role in the spread of the virus following large numbers of cases being reported in health care workers, patients, and visitors to health care facilities. Surface sampling revealed SARS-CoV on surfaces and inanimate objects suggesting a possible source of transmission. The role that environmental factors, such as air temperature and relative humidity play in surface survival is important for risk assessment and the development of control measures.

Considered a biosafety hazard, only specially trained personnel are permitted to work with SARS-CoV under strict laboratory containment conditions. Two surrogate animal coronaviruses, transmissible gastroenteritis virus (TGEV) and mouse hepatitis virus (MHV), were studied at various temperature and humidity levels to determine their survival rate on stainless steel. Inactivation of the virus occurred most rapidly at extremely hot temperatures and high humidity levels. When exposed to temperature and humidity levels more typical of indoor environments, the viruses could persist on surfaces for up to 28 days.

"When high numbers of viruses are deposited, TGEV and MHV may survive for days on surfaces at air temperatures and relative humidity typical of indoor environments," say the researchers. "TGEV and MHV could serve as conservative surrogates for modeling exposure, the risk of transmission, and control measures for pathogenic enveloped viruses, such as SARS-CoV and influenza virus, on health care surfaces."

(L.M. Casanova, S. Jeon, W.A. Rutala, D.J. Weber, M.D. Sobsey. 2010. Effects of air temperature and relative humidity on coronavirus survival on surfaces. *Applied and Environmental Microbiology*, 76. 9: 2712-2717.)

## **Noroviruses Identified as Common Cause of Travelers' Diarrhea**

Noroviruses, infamous for causing outbreaks of gastroenteritis on cruise ships, may now be recognized as a common cause of travelers' diarrhea in multiple regions of the world as well. Researchers from the U.S. and abroad detail their findings in the May 2010 issue of the *Journal of Clinical Microbiology*.

Travelers' diarrhea occurs frequently in people traveling between industrialized nations and regions of the developing world. Currently, travelers' diarrhea is largely attributed to *E. coli* infection, however, a specific causatory agent is never identified in up to 40% of reported cases. Such incidents of unexplained diarrheal illness are believed to be caused by undetected bacterial or nonbacterial pathogens and until

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now the prevalence of noroviruses as a cause of diarrhea in international travelers has not been well known.

Noroviruses, which are contracted through fecal-oral transmission, are highly contagious in people of all ages. Samples from international travelers to Mexico, Guatemala, and India suffering from diarrhea were collected and examined for the prevalence of noroviruses. Of the 571 samples studied noroviruses were identified in 10.2% of cases, making it second to only diarrheagenic *Escherichia coli* as the most common pathogen associated with the travelers' diarrhea.

"This study demonstrates that noroviruses are an important pathogen of travelers' diarrhea in multiple regions of the world," say the researchers. "It is likely that this enteric pathogen has long been underestimated as a cause of travelers' diarrhea due to limitations of detection methods."

(H.L. Koo, N.J. Ajami, Z.D. Jiang, F.H. Neill, R.L. Atmar, C.D. Ericsson, P.C. Okhuysen, D.N. Taylor, A.L. Bourgeois, R. Steffen, H.L. DuPont. 2010. Noroviruses as a cause of diarrhea in travelers to Guatemala, India, and Mexico. *Journal of Clinical Microbiology*, 48. 5: 1673-1676.)

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