

IADR/AADR publish study on dental caries vaccine

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In a report on a preclinical investigation titled "Flagellin Enhances Saliva IgA Response and Protection of Anti-caries DNA Vaccine," lead author Wei Shi, Wuhan Institute of Virology, Chinese Academy of Sciences, and his team of researchers demonstrate that anti-caries DNA vaccines, including pGJA-P/VAX, are promising for preventing dental caries. However, challenges remain because of the low immunogenicity of DNA vaccines. This study is published in the *Journal of Dental Research*, the official publication of the International and American Associations for Dental Research (IADR/AADR).

In this study, Shi and team used recombinant flagellin protein derived from *Salmonella* as mucosal adjuvant for anti-caries DNA vaccine (pGJA-P/VAX) and analyzed the effects of *Salmonella* protein on the serum surface protein immunoglobulin G and saliva surface protein immunoglobulin A [antibody responses](#), the colonization of [Streptococcus mutans](#) (*S. mutans*) on rodent teeth, and the formation of caries lesions. The results showed that *Salmonella* promoted the production of surface protein immunoglobulin G in serum and secretory immunoglobulin A in saliva of animals by intranasal immunization with pGJA-P/VAX plus *Salmonella*.

Furthermore, Shi found that enhanced [surface protein](#) immunoglobulin A responses in saliva were associated with inhibition of *S. mutans* colonization of tooth surfaces and endowed better protection with significant less carious lesions. In conclusion, the study demonstrates that recombinant *Salmonella* could enhance specific immunoglobulin A

responses in saliva and protective ability of pGJA-P/VAX, providing an effective mucosal adjuvant candidate for intranasal immunization of an anti-caries DNA vaccine.

Daniel Smith, The Forsyth Institute, wrote a corresponding perspective article in response to the Shi et al report titled "Prospects in Caries Vaccine Development." In it, he states that [DNA vaccine](#) approaches for dental caries have had a history of success in animal models. Dental caries vaccines, directed to key components of *S. mutans* colonization and enhanced by safe and effective adjuvants and optimal delivery vehicles, are likely to be forthcoming.

"These papers highlight the exciting potential of using vaccines to protect against dental caries," said JDR Editor-in-Chief William Giannobile. "This research is promising and provides optimism to help promote public health of caries-susceptible individuals."

More information: jdr.sagepub.com/content/early/recent

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