

'Painless' plasma brush is becoming reality in dentistry, engineers say

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The plasma brush uses chemical reactions to disinfect and clean out cavities for fillings, in addition to forming a better bond for cavity fillings. Credit: MU News Bureau

University of Missouri engineers and their research collaborators at Nanova, Inc. are one step closer to a painless way to replace fillings. After favorable results in the lab, human clinical trials are underway on the "plasma brush."

In less than 30 seconds, the plasma brush uses chemical reactions to disinfect and clean out [cavities](#) for fillings. In addition to the bacteria-killing properties, the "cool flame" from the plasma brush forms a better bond for cavity fillings. The [chemical reactions](#) involved with the plasma brush actually change the surface of the tooth, which allows for a strong and robust bonding with the filling material.

"There have been no side effects reported during the lab trials, and we expect the human trials to help us improve the prototype," said Qingsong Yu, associate professor of mechanical and [aerospace engineering](#) of MU, and Meng Chen, chief scientist from Nanova, Inc., which holds a co-patent for the plasma brush with MU.

"200 million tooth restorations cost Americans an estimated \$50 billion a year, and it is estimated that replacement fillings comprise 75 percent of a dentist's work. The plasma brush would help reduce those costs," said Hao Li, associate professor of mechanical and aerospace engineering in the MU College of Engineering. "In addition, a tooth can only support two or three restorations before it must be pulled. Our studies indicate that fillings are 60 percent stronger with the plasma brush, which would increase the filling lifespan. This would be a big benefit to the patient, as well as [dentists](#) and [insurance companies](#)."

Provided by University of Missouri-Columbia

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