

DON'T BE FOOLED BY FAKES

Company stops numerous distributors at IDS 2017 from selling knock-offs of its patented, trademarked mixing tips.

► page A4

**CEMENT FOR ADVANCED RESTORATIVES**

Multisurface luting cement adheres to zirconia, lithium disilicate and other advanced restorative substrates.

► page A5

**IMPLANT TRIBUNE****SEPTEMBER: AAP TO MEET IN BOSTON**

Focus is on 'Navigating the Future of Periodontology.'

► page B1



Researchers' molecule stops caries in lab rats

By Jeff Hansen, UAB News

University of Alabama at Birmingham researchers have created a small molecule that prevents or impedes tooth cavities in a preclinical model. The inhibitor blocks the function of a key virulence enzyme in an oral bacterium, a molecular sabotage that is akin to throwing a monkey wrench into machinery to jam the gears.

In the presence of the molecule, *Streptococcus mutans* — the prime bacterial cause of dental caries — is unable to make the protective and sticky biofilm that allows it to glue to the tooth surface, where it eats away tooth enamel by producing lactic acid.

This selective inhibition of the sticky biofilm appears to act specifically against *S. mutans*, and the inhibitor drastically reduced dental caries in rats fed a caries-promoting diet.

"Our compound is drug-like, non-bactericidal and easy to synthesize, and it exhibits very potent efficacy *in vivo*," the researchers explained in an article in *Scientific Reports*. It is "an excellent candidate that can be developed into therapeutic drugs that prevent and treat dental caries."

About 2.3 billion people worldwide have dental caries in their permanent teeth, according to a 2015 Global Burden of Disease study. Current practices to prevent

cavities, such as mouthwash and tooth brushing, indiscriminately remove oral bacteria through chemical and physical means and have limited success. Caries is the Latin word for rotteness.

"If we have something that can selectively take away the bacteria's ability to form biofilms, that would be a tremendous advance," said Sadanandan Velu, PhD, associate professor of chemistry in the UAB College of Arts and Sciences and a lead researcher in the study.

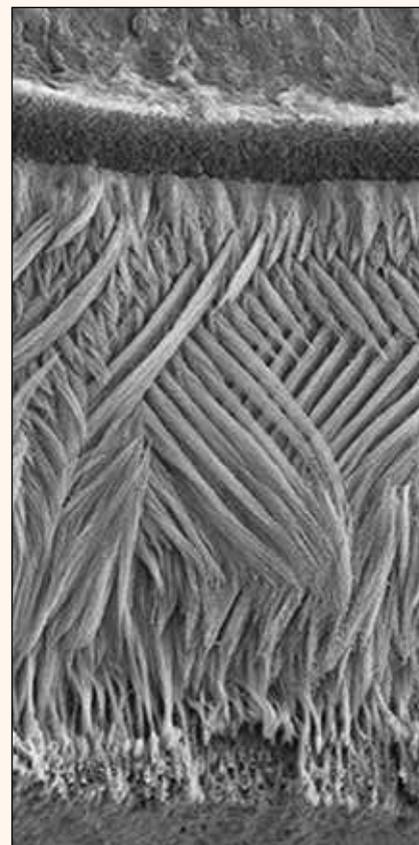
"This is particularly exciting in the broad sense of targeting microbiota using chemical probes tailored to the specific pathogen within a complex microbial community," said Hui Wu, PhD, professor of pediatric dentistry, UAB School of Dentistry, director of UAB Microbiome Center and a lead investigator in the study.

Wu's expertise is bacteriology and biochemistry, and Velu's is structure-based drug design. Their interdisciplinary study also included researchers from the department of microbiology in the UAB School of Medicine.

Research details

The glucan biofilm is made by three *S. mutans* glucosyltransferase, or Gtf, enzymes. The crystal structure of the GtFC glucosyltransferase is known, and the UAB researchers used that structure to

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Seen under a microscope, mouse dental enamel treated with acid reveals interwoven mineralized rods that give teeth strength and flexibility. A molecule created by University of Alabama researchers blocks formation of the sticky biofilm that enables *Streptococcus mutans* to attach itself to the tooth surface and eat away the enamel.

Photo/Provided by Olivier Duverger and Maria Morasso, National Institutes of Health

INDUSTRY NEWS**A2-A7**

- NuSmile Ltd., a worldwide leader in pediatric esthetic restorative dentistry, will present the NuSmile Summit for pediatric dentists, Jan. 19-20, in Clearwater Beach, Fla.
- Sulzer Mixpac continues to enforce its rights. Avoid fakes by looking for the candy-color quality seal.
- Envy Self-Etch, Self-Adhesive Cement by Essential Dental Systems: Luting cement adheres to zirconia and other advanced restorative materials.
- New photonic design uniformly distributes high-def light: Designs for Vision LED DayLite Micro HDi headlights optically focus the light from the LED to provide 45 percent more light with uniform distribution.
- Improve your leadership skills today: Being a good dentist doesn't make you a good leader — but mastering these skills can help.

IMPLANT TRIBUNE**B1-B4**

- AAP will be 'Navigating the Future of Periodontology' in Boston in September.
- Periodontal issues may conflict with conception.
- AAID releases preliminary program for its 66th educational conference in San Diego.

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Summit planned for pediatric dentists

NuSmile Ltd., a worldwide leader in pediatric esthetic restorative dentistry, will present the NuSmile Summit, Jan. 19-20, in Clearwater Beach, Fla. Attendees will be able to create their own schedule by choosing courses that best meet their needs. Attendees can receive up to 16 C.E. credits from courses offered by several of the world's most respected experts in all facets of pediatric dentistry.

"The 2018 NuSmile Summit is designed to help pediatric dentists and general practitioners who treat pediatric patients keep abreast of the latest advances in pediatric dentistry," said Diane Johnson Krueger, NuSmile founder and CEO. "Our topics and speakers have been carefully chosen to enable attendees to take their practices to the next level regarding both treatment and practice management."

"We're very excited about the line-up of distinguished experts we've been able to assemble to lead our seminars, including several directors from the renowned Institute for Pediatric Dentistry," said Mike Loessberg, NuSmile director of sales, U.S. and Canada. "The theme of the NuSmile Summit is 'Bringing You Next-Level Education' to reflect our passion for helping

dentists significantly enhance both the pediatric treatment their practices provide and the productivity and profitability their practices deliver."

One of the Summit's highlights will be the popular "Zirconia REINVENTED" hands-on workshop, in which Dr. David Salar and Dr. David Evans will provide comprehensive training in the art of placing zirconia crowns for every primary tooth. Other treatment courses include "Radiographic Findings of Pediatric Diseases" by Dr. Shailesh Kottal, "Sedation Protocol" by Dr. Steven Wilson and a "New Approaches to Pediatric Pulp Therapy" workshop by Dr. Jessica Lee.

Among the practice-management courses are "Strategies for Practice Growth" by Scott Lauer, "25 Things That Changed My Practice" by Dr. William Waggoner, "Overview of Employment and Compensation Issues" by Brian Colao and "Ready to Start Your Own Practice: Where to Begin?" by Matthew Veatch.

The summit will be at the Grand Wyndham Resort in Clearwater Beach (recently named the "#1 Beach in the U.S." by Trip Advisor). Dentists may preregister at (800) 346-5133 or www.nusmile.com.

About NuSmile

Shortly after its 1991 founding in Houston by Diane Johnson Krueger, NuSmile invented its first esthetic pediatric crown. In the 25 years since, more than 4 million NuSmile crowns have been used in restorations.

The company's offerings include the NuSmile ZR Zirconia crown system with Try-In crowns to prevent saliva/blood contamination and NuSmile BioCem® BioActive Cement for exceptional bond strength and handling; NuSmile Signature Preveneered crowns; NuSmile SSC Pre-contoured crowns; and NuSmile NeoMTA® pulp therapy medicament.

According to the company, NuSmile prides itself on customer care, commitment to research and support of the American Academy of Pediatric Dentistry, International Association of Pediatric Dentistry, Canadian Academy of Pediatric Dentistry/Académie Canadienne de Dentisterie Pédiatrique, and the Institute for Pediatric Dentistry and other organizations dedicated to the dental care of children and the dentists who serve them.

(Source: NuSmile)

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screen — via computer simulations — 500,000 drug-like compounds for binding at the enzyme's active site.

Ninety compounds with diverse scaffolds showing promise in the computer screening were purchased and tested for their ability to block biofilm formation by *S. mutans* in culture. Seven showed potent, low-micromolar inhibition, and one, #G43, was tested more extensively.

#G43 inhibited the activity of enzymes GtfB and GtfC, with micromolar affinity for GtfB and nanomolar affinity for GtfC. #G43 did not inhibit the expression of the gtfC gene, and it did not affect growth or viability of *S. mutans* and several other oral bacteria tested. Also, #G43 did not inhibit biofilm production by several other oral streptococcal species.

In the rat model of dental caries, animals on a low-sucrose diet were infected with *S. mutans* and their teeth were treat-

ed topically with #G43 twice a day for four weeks. The #G43 treatment caused very significant reductions in enamel and dentinal caries.

"In conclusion," Wu and Velu wrote in their paper, "using structure-based design, we have developed a unique low-micromolar biofilm inhibitor that targets *S. mutans* Gtfs through binding to key virulence factors, Gtfs."

Co-authors with Wu and Velu in the paper, "Structure-based discovery of small

molecule inhibitors of cariogenic virulence," are Qiong Zhang, Zhang Hua and Jing Zou, UAB department of pediatric dentistry; Bhavitavya Nijampatnam and Thao Nguyen, UAB department of chemistry; and Xia Cai and Suzanne M. Michalek, UAB department of microbiology.

Funding came from National Institute of Dental and Craniofacial Research grants RO1DE022350 and RO3DE025058, and National Natural Science Foundation of China grant 81400502.

'Successful development of this selective lead inhibitor in the dental setting offers a proof of concept that selective targeting of keystone bacteria is promising for the design of new treatments.'

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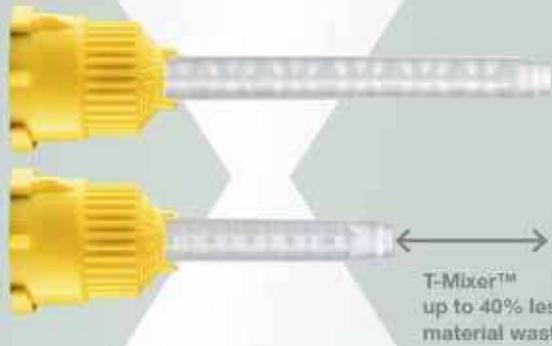
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