ENAMEL RESTORATIONS ON THE HORIZON?

Researchers hope that one day current restorative materials can be replaced with dental restorations that are identical or similar to natural tooth enamel.

Researchers at the University of Southern California's School of Dentistry's Center for Craniofacial Molecular Biology, or CCMB, have been studying tooth enamel to determine how it is created. They have identified tiny spheres that regulate the formation and organization of tooth enamel by controlling the substance's crystalline growth. These spheres—called nanospheres because they are only 18 to 20 nanometers in diameter—are formed by a naturally occurring family of tooth-specific proteins known as amelogenins.

Amelogenins self-assemble to form the extracellular matrix within which the inorganic enamel crystals start to form. At first, the crystals grow only on their end surfaces. With the nanospheres acting as spacers, they build a scaffold on which mature enamel can eventually form. After enzymes have broken down the amelogenins, the crystals start to grow on all of their surfaces. They thicken, clump together and create mature enamel.

In 1994, researchers took the gene for an amelogenin from a mouse and produced an identical recombinant amelogenin, using a bacterial reproductive process. This recombinant amelogenin, which researchers can now produce in quantity, can self-assemble to make nanosphere structures identical to those seen in humans and other animals.

Researchers currently are growing crystals within synthetic matrices made from recombinant amelogenin.

“We get very long, straight structures, and the crystals grow only on their end faces,” says A.G. Fincham, Ph.D., a CCMB researcher. “We can’t make enamel yet, but we can see how nature does it. And the nanospheres clearly have a capacity to regulate the way crystals grow.”

STREPTOCOCCUS MUTANS UNSTUCK

Streptococcus mutans could be prevented from adhering to teeth and, as a result, causing cavities, European researchers report in the January issue of Nature Biotechnology.

Researchers from England and the Netherlands say that they have synthesized a peptide—a short protein—that binds to teeth where S. mutans ordinarily would adhere. When the peptide binds to the teeth, it crowds out S. mutans.

In a preliminary trial, researchers treated 11 volunteers with a drug that kills oral bacteria, and then applied the synthetic peptide, another peptide or salt water twice a week for three weeks. In addition, each subject used a mouthwash twice a day that contained the same substance the dentist applied to his or her teeth.

Researchers detected S. mutans in six of the remaining seven subjects.

Researchers suggest that peptides, such as the one they created, may have wide applicability in fighting infections in humans and animals. And, as their antiadhesion peptide does not disrupt benign microorganisms in the mouth, resistance to synthetic peptides is less likely to develop than is resistance to antibiotics.

DENTAL SURGERY BOOSTS BLOOD PRESSURE

Blood pressure increases at a greater rate in middle-aged and older patients undergoing tooth extraction than in their younger counterparts, according to a study in the November issue of American Journal of Hypertension.

Japanese researchers studied 40 patients between the ages of 19 and 74 years of age who underwent tooth extraction. The 14 men and 26 women were divided into two groups of 20: patients up to 40 years of age and patients older than 40 years of age.

Two patients from the younger group and four patients from the middle-aged and older group had been diagnosed with high blood pressure; three of these patients were taking anti-hypertension medication.

Researchers averaged each patient’s blood pressure and pulse rate before dental surgery, during administration of a local anesthetic, during surgery and after surgery, using an electrocardiograph.

They found an increase in systolic blood pressure during surgery.
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surgery among all patients. Middle-aged and older patients, however, had a more significant increase in systolic blood pressure than did younger patients.

Researchers also found that among younger patients, sympathetic nervous system activity increased when local anesthetic was administered but not during the surgery itself. Among middle-aged and older patients, researchers found a decrease in nervous system activity when the anesthetic was administered.

According to researchers, these findings suggest that the greater increase in blood pressure among older patients might be the result of something other than nervous system activation—for example, atherosclerosis. Atherosclerotic blood vessels are less elastic than are healthy vessels, and they may not be able to dilate sufficiently during periods of stress when the heart pumps greater volumes of blood. When this happens, blood pressure rises.

OMISSIONS

In December JADA, the article “Inhibiting Interspecies Coaggregation of Plaque Bacteria With a Cranberry Juice Constituent” by Ervin I. Weiss and colleagues should have contained the following statement:

“The study received partial financial support from Ocean Spray Cranberries Inc. However, the company had no role in development of the experimental design, analysis of the data or interpretation and presentation of the findings.”

Through a printing error, the photo of Dr. Maria Rosa Watson was omitted from her article, “Women’s Oral Health Awareness and Care-Seeking Characteristics: A Pilot Study,” in December JADA. JADA regrets the error.

Compiled by Amy E. Lund, editorial coordinator.

MEETINGS

Meeting dates are subject to change. Dentists interested in attending any of the listed meetings should contact the sponsoring organization for more information.

- The International Federation of Dental Education Associations will hold its meeting March 10-11 in Vancouver, British Columbia, Canada. For more information, contact Dr. Richard W. Valachovic by e-mail at “valachovicR@aads.jhu.edu”, by phone at 1-202-667-9433 or by fax at 1-202-667-0642.

- Dental Med 99, the 13th International Dental Meeting and First Dental Multimedia Show of the Journées Dentaires Internationales de Nice–Côte d’Azur, will be held in Nice, France, March 11-13. For more information, contact Dr. Michel Burdin by phone at 1-011-33-4-93-13-03-21 or by fax at 1-011-33-4-93-13-47-02, or visit the Web site at “http://www.dentalmedia.com”.

- The 11th Annual Symposium on Treatment of Headaches and Facial Pain will be held on April 18 at the New York Marriott in New York. For more information, contact Dr. Alexander Maukop by phone at 1-212-794-3550 or by fax at 1-212-794-0591.

- The Second National Conference on Over-the-Counter Dental Drugs and Products will be held April 23-26 at the Pan Pacific Hotel in San Francisco. To register by phone, call 1-415-929-6486 or 1-800-922-4UOP if in California. To register online, visit the Web site at “http://www.dental.uop.edu.”

- The 14th International Conference on Oral and Maxillofacial Surgery will be held April 24-29 at the Washington Hilton and Towers in Washington, D.C. For details, phone 1-847-678-6200, fax 1-847-678-6286, e-mail “inquiries@aaoms.org” or visit the Web site at “http://www.aaoms.org”.

- The 50th annual meeting of the New Orleans Dental Association will be held Sept. 15-18 at the Ernest N. Morial Convention Center in New Orleans. For more information, contact Normalee Ward by phone at 1-504-834-6449 or visit the Web site at “http://www.nodc.org”.

APPOINTMENTS/ELECTIONS/AWARDS

- Dr. Philip Person, Flushing, N.Y., was honored by the New York Academy of Sciences for 50 years of distinguished service to science, technology and society.

- Dr. Anthony H.L. Tijan, West Covina, Calif., received the 1998 Mitchinosuke Nakayama Memorial Award from the Pierre Fauchard Academy.

- Dr. Shig Ryan Kishi, Newport Beach, Calif., received the French Gold Medal from Le Conseil National de l’Ordre des Chirurgiens-dentistes.

- Dr. C. John Munce, Loma Linda, Calif., was awarded fellowship in the Academy of Dentistry International.

- Dr. Kathryn Atchison, Santa Monica, Calif., has been appointed associate dean for research at the UCLA School of