What do Batman and orthodontic braces have in common?

By Shirley Gutowski, RDH, RSDH, FAHD

The most stomach-wrenching thing dentists see is an oral cancer lesion; for hygienists, it’s the melted enamel under and around orthodontic brackets and bands. The hot pink tissue seems to pulse with a life of its own. It covers the gingival third of the tooth hiding a caustic biofilm of microorganisms attached to the teeth. Scientists can now add tooth enamel to that list of development of skin and the nervous system. Genetic discovery could lead to advances in dental treatment

By David Stauth
Science Writer, Oregon State University

Corvallis, Ore. — Researchers have identified the gene that ultimately controls the production of tooth enamel, a significant advance that could some day lead to the repair of damaged enamel, a new concept in cavity prevention, and restoration or even the production of replacement teeth.

The gene, called Ctip2, is a “transcription factor” that was already known to have several functions — in immune response and the development of skin and the nervous system. Scientists can now add tooth development to that list.

The finding was just published in the Proceedings of the National Academy of Science.

“It’s not unusual for a gene to have multiple functions, but before this we didn’t know what regulated the production of tooth enamel,” said Chrissa Kioussi, an assistant professor in the College of Pharmacy at Oregon State University. “This is the first transcription factor ever found to control the formation and maturation of ameloblasts, which are the cells that secrete enamel.”

Really looking at the array of toothbrushes available for ortho patients is important. So is finding out if they’ll use a Water Pik. The benefits of pulsed-water for removing biofilm and creating ghost cells of the bacteria in the biofilm is substantiated in the literature. Water is the only thing necessary for outstanding results.

Resin modified glass ionomer (RMGII) On occasion, things get out of the clinician’s hands and enamel breaks down. Something new on the market can be used as a temporary band aid over a white spot infection that has started anywhere on the teeth. It’s a resin modified glass ionomer called Vanish XT Varnish. The dispenser is new to the hygiene world in that it uses double-barrel dispensing. Like epoxy cement, two components are squeezed out onto a mixing pad, mixed chairside and applied with a microbrush or other similar device, then the material is light cured. It is tooth colored as long as the tooth is white. It releases fluoride to the area and recharges when fluoride is around.

Sociological & psychological considerations

The sociological and psychological needs of the teenage patient also need to be addressed. Remove all judgment; the situation you are looking at with each patient is what it is. With teenage patients, it’s very tempting to belittle or use a condescending tone.

Sometimes the patient doesn’t want the treatment and will show his or her displeasure by refusing

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Fluoride Applying fluoride varnish biannually may decrease unsightly white spot infections. Some of the elastomeric ligatures come in fluoride releasing types that cut down on biofilm too. The fluoride release is temporary, lasting only about two weeks; one study stated that they shouldn’t be counted on for decreasing enamel breakdown.

Bonding cement The cement for bonding the brackets onto the teeth can make a huge difference, too. An ortho cement containing amorphous calcium phosphate (ACP) (Bosworth Ageis) contains the components to rebuild enamel. Without relying on a teenager to remove biofilm, the cement changes properties during an acid challenge to release the ACP, thus releasing the consequences of teenage hormone surges that put self-care on the back burner.

The Ageis cement is a compli-

ance-free way to go. The hygiene department can have more say in treatment modalities if it affects the oral hygiene of the patient. Stopping therapy by removing the brackets is not always a good option, although it should work its way to the top of the option list if by six months the patient’s oral hygiene hasn’t improved.

Pastes Along with the enamel replacement trend there are newer pastes that do more than just provide fluoride. The list is long, starting with Colgate Total with Triclosan, and advancing to products containing Novamin and Recaldent, and the new one Tricalcium Phosphate (TCP). Having these products on hand to give orthodontic patients can set the stage for a premiere cosmetic outcome, along with a great orthodontic outcome.

Prophecy paste Deciding on a prophesy paste is also a worthwhile exercise. It seems as if new polishing pastes are brought to the market almost every day. The newest Nupro contains Novamin. New prophecy cups and brushes can never resist break-

ing apart around brackets or wires. An air slurry polisher is important to use on patients with brackets and bands. Ricarbonic has many healing properties and can reduce biofilm on its own working with the sodium pump in the cell wall of the bacteria to upset the equilibrium, thus killing the bacteria. Calcium carbonate in Prophy Pearls (KaVo) is also helpful to the tissue, although not as dramatically.

Home care Customizing the home care regimen is very important for people wearing orthodontic appliances. Many hygienists go to the cosmetic end and talk about halitosis or gunky food hanging from the brackets or wires, making the patient unappealing to the opposite sex. The problem is, though, the patient’s don’t respond well to this scare tactic. If they want to, they’ll find someone to get close to.

What to do with melted enamel?

Today’s oral care products, over the counter and professional, have the another answer to this problem. ‘living better though chemistry’ is advanced appliances that discourage enamel breakdown.

Solutions: appliances and chemical ones

One option is to use the more advanced appliances that discourage biofilm from accumulating. The ‘living better though chemistry’ is another answer to this problem. Today’s oral care products, over the counter and professional, have the potential to eliminate that stomach-wrenching moment. Even without relying on patient compliance, change can occur to save the teeth.

Brackets New passive self-ligating brackets are a great way to go (Damon), They discourage biofilm formation. The design of the bracket allows the low-force memory wire to move the teeth with less chance for bacteria to accumulate because they don’t require ligatures. Elastic liga-
tures greatly increase the number of microorganisms attached to the apparatus during treatment. This increased level of biofilm activity increases the incidence of decalci-
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Dear Reader,

In this issue, readers will be learning about alternative treatment modalities for orthodontic patients. While these treatments may have been introduced to some practitioners, the information will be completely new to others. How is it possible that some hygienists are actually using new products for various dental hygiene applications and others have never heard of such things?

This is truly reflective of the amount of interest a clinician takes in keeping up to date with the world of dental hygiene. Many hygienists are content doing the things they always have and do not seek out new, potentially better ways to treat patients. The question I pose to hygienists is this. Do you want your physician practicing 1980s medicine or do you want him/her to be able to educate you on the latest recommendations being made by the medical profession? I am sure the answer is not only do you want your medical professional to be up to date, you expect it!

Well, guess what? Dental patients expect dental professionals to deliver the latest and best oral care possible. At this point in time, hygienists are fortunate to have a menagerie of places in which to gain education. Learning about new developments and different ways of doing things used to require time away from the office, travel and sitting in a meeting room all day. Now hygienists can learn 24/7 without even leaving the living room, if that is what we choose.

Hygiene journals and magazines are full of information and they can be accessed online. Yes, even Hygiene Tribune can be read via the Web, Live, as well as taped Webinars are gaining popularity. Online hygiene groups/study clubs are wonderful for when a power brush isn’t practical, like at school. I’m very particular about my oral hygiene recommendations. For instance, I’d never disregard the professionals you generally recommend for oral hygiene?

When you’re presented with patients with traditional brackets and bands, what do you generally recommend for oral hygiene?

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When you’re presented with patients with traditional brackets and bands, what do you generally recommend for oral hygiene?

Whether you are wearing the Damon braces now, are you excited about the difference in oral hygiene you’re able to achieve wearing them over others?

Yes, because of the way the brackets are designed I find that oral hygiene is much easier for me. I see much more accumulated plaque biofilm in a patient with the traditional brackets and bands set up than the patient with Damon braces.

Can you tell us what makes them so different? Is it the design of the hardware or the materials used?

It’s not the materials, they’re similar to traditional equipment. Light wires are used to move the teeth with little pressure. This allows for the facial muscles and tongue to help the process along. The light pressure lessens the chance for bone necrosis to occur, which I believe causes some of the tissue overgrowth we see in teens undergoing orthodontic treatment. Heavy pressure can cause the alveolar bone to crush, decreasing blood supply and cause pain.

The other oral hygiene friendly aspect of this system is the self-ligating brackets. The wires go into the brackets and there’s no need for those little elastic bands to hold the tooth against the wire. Less elastic, less plaque biofilm, better oral hygiene.

When you’re presented with patients with traditional brackets and bands, what do you generally recommend for oral hygiene?

Since embarking on this journey I’ve had a number of eye opening experiences. I had no idea about the potential for necrosis, for example. Now that I’m living with brackets full time, I’ve made some adjustments in my oral hygiene recommendations. For instance, I’d never disregard the new chemistry we have available today. I recommend Denclude for nearly everything. I also recommend MI Paste. I recommend the Sonicare Flexcare for anyone with brackets and bands, and the Sunstar Summit brush for when a power brush isn’t practical, like at school. I’m very particular about what I recommend and I’m seeing better results than ever. In the office, I apply fluoride varnish and use smart prophyl paste.

Tell us what you think!

Do you have general comments or criticism you would like to share? Is there a particular topic you would like to see covered in future issues of Dental Tribune America?

Let us know by e-mailing feedback@dtamerica.com. We look forward to hearing from you!
the National Children’s Oral Health Foundation (NCOHF) has awarded three Dental Hygienists’ Toothfairy Grants totaling $14,000 to organizations to help eliminate children’s suffering from preventable dental disease. Grants are made possible through contributions to the Dental Hygienists’ Toothfairy Campaign in partnership with the American Dental Hygienists’ Association.

NCOHF President and CEO Fern Ingber said, “NCOHF is very grateful to the American Dental Hygienists’ Association and all dental hygienists who have made generous contributions to the Toothfairy Campaign. Together we are focused on providing underserved children effective preventive oral health services that break the cycle of preventable pediatric dental disease.”

With an understanding of its genetic underpinning, Kioussi said, it may be possible to use tooth stem cells to stimulate the growth of new enamel. Some research groups are already having success growing the inner portions of teeth in laboratory animal experiments, but those teeth lack hard coatings — the scientists lacked the genetic material that makes enamel.

“Enamel is one of the hardest coatings found in nature, it evolved to give carnivores the tough and non-latex dental dam excellent tear resistance, great color contrast with teeth lavender and in medium gauge. Crosstex Dental Dams isolate procedures from blood and saliva and tongue and cheek interference while reducing contaminated aerosols and the risk of patients swallowing/aspirating foreign bodies. Also available are: powder-free, low protein latex dental dams. Both products drastically reduce the risk of allergic latex reactions. Crosstex, once again, leads the dental industry in safety and efficiency!”

Crosstex introduces the next generation of safety: non-latex dental dam

The researchers used a laboratory mouse model in this study in which this gene has been “knocked out” and its protein is missing. Such mice lack basic biological systems and cannot live after birth, but allow scientists to study what is there and what’s missing.

In this case, the mice had rudimentary teeth ready to erupt, but they lacked a proper enamel coating and never would have been functional.

“Enamel is one of the hardest coatings found in nature, it evolved to give carnivores the tough and long-lasting teeth they needed to survive,” Kioussi said. "It could be really cool, a whole new approach to dental health."