Scientists identify molecules that could help tackle tooth loss and support regeneration

Research sheds light on science behind formation of the periodontal ligament

By Amy King
University of Plymouth

Our teeth take thousands of bites per day, and understanding exactly what holds them in place and how is key to helping people live with their own teeth for longer.

Now new research published in the Journal of Dental Research has shed light on the science behind the formation of the periodontal ligament, which helps keep the tooth stable in the jawbone. This improved understanding will also help scientists work towards regenerating the tissues that support teeth.

The study, led by the Universities of Plymouth and Geneva, shows how a signalling pathway called Notch, which is known to be activated in stem cells and cancer, is important for periodontal ligament development.

A signalling pathway describes how a group of molecules in a cell work together to control one or more cell functions, such as cell division or cell death. After the first molecule in a pathway receives a signal, it activates another molecule. This process is repeated until the last molecule is activated and the cell function is carried out.

Abnormal activation or inhibition of certain signalling pathways can lead to cancer and other conditions, including problems with tissue regeneration.

A key finding in the new study, which was conducted in rodent teeth, is that Lamin A, a cell nuclear protein, is a direct target of Notch pathway. Lamin A is best known for its mutated form progerin, which causes fatal “early aging” disease, Progeria syndrome — but by uncovering its involvement in periodontal ligament formation, scientists have better insight into how molecules function during tissue regeneration and how the process could be affected during disease.

Corresponding author Dr Bing Hu, associate professor of oral and dental health research in Peninsula Dental School at the University of Plymouth, said:

“The periodontal ligament starts to properly hold the tooth in the jawbone when a tooth breaks out and becomes functional. Understanding the mechanisms of how periodontal ligaments develop and the molecules that assist the tissue becoming mature is really important for our understanding of tissue regeneration and repair. The next steps are for us to see if and how the molecules we have identified in this study can be translated into a human-only model and, in turn, how they are affected in both healthy and diseased conditions.”

Hu is also part of the university’s Institute of Translational and Stratified Medicine (ITSMed).

This research is a part of the MD-PhD thesis of Dr Dénes Dénes of the University of Geneva, titled “Post-emergent tooth eruption: eruption rate, periodontal ligament maturation and cell signalling,” directed by Professor Stavros Kilianidis.

Dénes said: “We believe that our findings are an important stepping stone to better dental treatments in situations involving the periodontal ligament, such as gum disease (periodontitis), tooth restoration by dental implants or orthodontic tooth movement.”

Full study is available in the Journal of Dental Research

The full study, titled “Notch coordinates periodontal ligament maturation through regulating Lamin A,” can be found in the Journal of Dental Research (doi: 10.1177/0022034519871448).

This study was supported by the Swiss National Science Foundation, the European Union Marie Skłodowska-Curie Actions, the European Regional Development Fund and the Biotechnology and Biological Sciences Research Council (BBSRC).
Remembering Dr. Mort Divack

By Dr. David L. Hoexter, Editor In Chief

“Anyone here from the Bronx?”

It was a question that changed his life, and the lives of others. Dr. Mort Divack asked that question as he entered an apartment to attend a social event many years ago. At that party was a vivacious, lovely lady named Ruth. Smitten, Mort married her, and the world has never been the same. Two daughters, grandchildren, respect from colleagues, participation in dental organizations — as well as tireless support and advocacy for dental education for all participants in the oral health field. When Mort and Ruth were together, everyone won.

Mort passed away this July. A loss of an amazing talent in the dental field. At the outset of his participation in organized dental-industry support, he joined a local dental society, the First District Dental Society (now called the New York County Dental Society). He volunteered on several committees before becoming an elected officer.

Always at his side at every meeting, driving him from his office in Queens to the dental meetings, staying involved through the entire meeting, and then driving home — was Ruth. What a team! Always at every meeting and always with smiles.

Being an officer in the First District (the largest local dental society in the country) requires near-endless extra time and effort on top of your practice. Yet Mort, while already providing leadership and guidance as president of the society — organizing education and encouraging new and young colleagues by example to join and participate in organized dentistry — he simultaneously accepted the additional responsibility of being the society’s representative and member of the Greater New York Dental Meeting organization. The positions demanded an abundance of altruistic energy combined with a deep appreciation of dental organizations and their role in best serving and protecting patients through dental education and open dissemination of the field’s growing base of knowledge for all. He and Ruth were together through it all.

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“At that party was a vivacious, lovely lady named Ruth. Smitten, Mort married her, and the world has never been the same.”

At the Greater New York Dental Meeting, Mort’s enthusiastic participation, love of dental education, appreciation of his colleagues and teammates — combined with his commitment to subject dissemination to the public and dental professionals — led to his election as chairman of the GNYDM. He naturally transitioned from representing the largest local dental society in the country to leading the country’s largest dental meeting. And again, Ruth was at his side at all the meetings. Following his term as GNYDM chairman, Mort worked tirelessly for the ADA, especially in education, while also serving on numerous committees for the national meeting.

Continuing with his giving after completion of his service with the ADA, Mort took on the challenge of being the chairman of the New York County local district dental society’s continuing education program. It was during these years that Mort encouraged me to present to the field on the newest modalities in periodontics and implants. He was always supportive of my efforts with helpful feedback and encouragement. One year when Mort and Ruth were vacationing in Europe, he had provided me with the dates. I secretly planned a surprise. When they arrived in Italy, they were greeted with my friend’s invitation to a personal estate for a private concert and grand feast. All this was to tell Mort and Ruth they were special and appreciated.

About 10 years ago, the GNYDM showed Mort how much it appreciated his experience and talent by inviting him to be a participating member of the GNYDM leadership team. The meeting organizers were thrilled when Mort accepted at a time when most of his colleagues were long since retired from practice and no longer involved in dental organizations. What a wonderful moment for Ruth, Mort and the GNYDM.

It is impossible to summarize Mort’s contributions in a few paragraphs — his love for family, his passion for dental politics and his gift of valuable time and energy to dental organizations. He lived a full, complete life, passing on at 96. His passion lives on through those who knew him and admired him — and most of all through his grandchildren, his Sandy and Daniel, his energetic Stacie and, of course, Ruth, his inseparable partner.

Not bad for a dentist practicing in Queens, serving a dental society representing Manhattan, and the Bronx.

Dr. David L. Hoexter

Ruth and Mort Divack. Photo/Provided by Dr. David L. Hoexter
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By Designs for Vision Staff

Designs for Vision is launching several new product lines at the American Association of Oral and Maxillofacial Surgeons (AAOMS) meeting Sept. 19-21 in Boston. Designs for Vision will be showing the new patented (US pat. 8928975B2) 3.5x and 4.5x Panoramic Loupes. According to the company, the Panoramic Field Loupes represent the most significant advancement in telescope design in more than 100 years.

The viewable areas are twice as large as prismatic expanded-field-designed loupes and up to five times greater than Galilean designed optics. Panoramic Field Loupes provide unprecedented field of view, clarity, definition and color, according to the company.

Designs for Vision is also featuring the REALITY 5 Star rated Micro 3.5EF Scopes and Micro 4.5EF Scopes, which use a revolutionary optical design that reduces the size of the prismatic telescope by 50 percent and reduces the weight by 40 percent while providing an expanded field view of the oral cavity. The company also is introducing the Micro 3.0EF in its line of Micro Series Loupes. The Micro 3.0EF has a field of view of 100 mm and weighs less than 70 grams.

You can see the lightest 3.0x magnification with the new 3.0x Galilean loupes from Designs for Vision. The lightweight Galilean design enables users to step up in magnification while retaining a sharp 70 mm field of view.

Designs for Vision is also introducing patented (U.S. pat. 8,851,709 and RE46,463) hands-free infrared technology with the WireLess IR HDi™ and the Micro IR HDi headlights. These headlights feature HDi. Designs for Vision’s exclusive advanced photonic design that provides uniform light distribution with maximum intensity. This feature optimizes color recognition and increases visualization of the surgical field.

According to Designs for Vision, its Panoramic Field Loupes represent the most significant advancement in telescope design in more than 100 years. Graphic/Provided by Designs for Vision

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Yankee Dental Congress is New England’s largest meeting for professionals seeking the highest quality dental continuing education, as well as dental products, services, and resources. With 26,000 dental professionals in attendance encompassing all members of the dental team, Yankee Dental Congress is the fifth largest dental meeting in the United States. Held in Boston each January, Yankee is a top resource in New England for industry professionals on the cutting-edge of oral health care.

Yankee will be “Advancing the Vision” in at the 2020 meeting with a wide variety of 300-plus continuing education courses taught by industry experts, including more than 125 free courses. Attendees will be able to gain insight on evolving trends and best practices by visiting over 400 exhibitors demonstrating some of the most innovative dental technology solutions in the industry.

The meeting provides an opportunity to broaden perspective and grow your dental professional network.

The Yankee Dental Congress is sponsored by the Massachusetts Dental Society, in cooperation with the dental associations of Connecticut, Maine, New Hampshire, Rhode Island, and Vermont, and members receive discounted registration.

But all dental professionals are invited to the meeting, which will be held at the Boston Convention & Exhibition Center from Jan. 30 through Feb 1.

(Source: Yankee Dental Congress)

Yankee Dental Congress ‘Advancing the Vision’ (Continued)

- INNOVATIVE, page A4

cally focuses the light from the LED to provide 45 percent more light with uniform distribution at 5,800° Kelvin, the ideal color temperature.

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Designs for Vision’s WireLess headlights free users from being tethered to a battery pack. The simple modular designs unplug the headlights from a specific frame or single pair of loupes. Prior technology married a cordless light to one pair of loupes via a cumbersome integration of the batteries and electronics into the frame. The compact design of the LED DayLite WireLess headlights are independent of any frame/loupes.

The LED DayLite Micro HDi uses the new High Definition Imaging with a lightweight headline in combination with the Micro power pack. The Micro power pack is the lightest and smallest power pack. The complete unit includes two power packs, and each power pack can run up to 10 hours.

See for yourself

You can see the Visible Difference® yourself by visiting Designs for Vision’s booth (No. 1051) at the AAOMS in Boston; or to arrange a visit in your office, call (800) 345-4009 or email info@dvimail.com.
AOMS President Dr. A. Thomas Indresano invites you, your staff and guests to the 101st American Association of Oral and Maxillofacial Surgeons Annual Meeting, Scientific Sessions and Exhibition, from Sept. 16-21 in Boston.

After its successful debut at the 2018 annual meeting, clinical education sessions this year will again be organized into clinical tracks. Each track will feature a large plenary session focusing on the latest evidence-based research followed by five interactive breakout sessions to enable greater topic engagement. This year’s track topics include: anesthesia, cosmetic surgery, dental implants, dentoalveolar surgery, orthognathic/obstructive sleep apnea surgery, pathology, pediatrics and cleft, reconstruction, TMD joint, trauma and more.

Pablos Holman – an inventor and entrepreneur – will deliver the annual meeting’s keynote lecture, "Innovate at all Costs," on Sept. 18. Holman will use examples garnered from his experience helping to create the world’s smallest PC, spaceships with Amazon founder Jeff Bezos and mosquito-zapping lasers with Microsoft founder Bill Gates.

The meeting offers a diverse range of topics to explore. When planning your schedule, consider a course on challenges in pain management, surgeon ergonomics or cone beam CT. Use the AAOMS Mobile App to build your personal itinerary, and allow time for fun in Boston. Definitely don’t miss the President’s Event at Fenway Park, where you’ll relax and enjoy an evening of fun at the home of the Boston Red Sox.
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