

# DENTAL TRIBUNE

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## DENTAL ANXIETY

In a recent study, researchers found that techniques such as tell-show-do and live modelling are very effective in helping children manage dental anxiety.

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## INTERVIEW

Dental Tribune International spoke with lead researcher Dr Nebu Philip, from the University of Queensland in Australia, to discuss the development a new product to help fight dental caries.

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## REALISTIC MOUTH MODELS

New research being carried out in collaboration with the University of Birmingham will allow dental students to practice on realistic mouth models that possess the tactile qualities of real mouths.

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# AOSC 2019 increase attendance by 20% with more than 900 professionals

By DTI



At this year's AOSC, there was a 20 per cent increase in attendees, with more than 60 per cent coming from overseas. (Photograph: AOSC)

**SINGAPORE:** Recently the Association of Orthodontists (Singapore) Congress (AOSC), organised by the Association of Orthodontists (Singapore), took place at the Marina Bay Sands hotel in Singapore. With an abundance of relevant information and an increase in attendees over the previous year, organisers of the event believe it reaffirms the show's position as the must-attend orthodontic event in the Asia Pacific region.

With an increase of 20 per cent over the previous year's numbers, more than 900 professionals from as far away as Oman came together to attend the three-day event. "We are humbled by the overwhelming response received at our sold-out workshops and staggering delegate numbers. Additionally, the steady

growth of delegates attending from international countries also marks a great achievement for AOSC. We are proud to have grown from a locally reputable show to one that is increasingly being recognised internationally within the orthodontic community," said Dr Mohan Senathirajah, President of the Association of Orthodontists (Singapore).

Attending this year's event were key opinion leaders such as Profs. David Sarver, Birte Melsen and Rolf Behrents. Additionally, 30 exhibiting companies and over 100 represented brands were present at the exhibition held alongside the conference. Attendees of the congress were able to gain information about the latest products and innovations in the industry, with leading orthodontic companies such as Invisalign, Ormco, Dentsply Sirona and others participating.

Other events that took place during the congress included the

Residents' Symposium. Attended by over 80 participants, attendees were treated to an afternoon of insightful discussions and a tour of the new National University Centre for Oral Health, Singapore. Another highlight of the congress was the scientific poster competition, which saw a doubling of entries. After a series of pre-event activities to raise funds for the Children's Cancer Foundation, a cheque for SGD21,000 was presented to Neo Lay Tin, executive director of the foundation, at the opening ceremony of the congress.

"From our modest beginnings back in the days, we have since scaled greater heights by attracting over 900 attendees and expanding our exhibition space. Riding on this wave of success, we will strive to continue to develop the show alongside the community," concluded Dr Seow Yian San, chairperson of the AOSC 2019 organising committee.

# Study indicates potential of berry extract to fight off dental bacteria

By DTI

**BRISBANE, Australia:** A recent study has suggested that concentrated extracts of polyphenol-rich fruits such as cranberries and blueberries could prove beneficial for combating certain bacteria in dental biofilm. The findings of the research, conducted at the University of Queensland in Brisbane and the University of Bristol in the UK, indicate the potential for cranberry phenols to modulate the pathogenicity of dental plaque.

The objective of the study was to continue testing natural components from fruit as bacteria inhibitors, and to further the research of their effects on oral health.

The researchers tested high-quality extracts, prepared as bioactive molecules from cranberries, blueberries and strawberries, as well as a combination of the three berry extracts called Orophenol, on 24-hour-old *Streptococcus mutans*

biofilms and compared them to the effects of a vehicle control.

The study found that higher concentrations of cranberry extract significantly reduced the bacteria's metabolic activity and acid production and bacterial/exopolysaccharide biovolumes, as well as resulted in a less compact architectural structure than that of the control-treated biofilms. Orophenol also had a significant impact, but slightly lower than that of

cranberries. Only the highest concentration level of blueberry extract significantly reduced metabolic activity and acidogenicity, but did not significantly affect the biovolume or biofilm architecture. The extract from strawberries had no significant impact on any bacterial activity. No extract killed the bacteria.

Continued research goes into fruit extracts for oral health care and bacteria management.



Phytonutrient-rich cranberries and blueberries may help inhibit biofilm according to a new study. (Photograph: NataliTerr/Shutterstock)

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# Frustration of being unable to anaesthetise a patient sufficiently?

By DTI

Many clinicians have experienced the frustration of being unable to anaesthetise a patient sufficiently despite trying various approaches or using a combination of amides. A variety of failures are known by specialists, for example, one spot in a tooth cannot be touched, everything is numb except the tooth, the last bit of caries cannot be removed without pain or intra-pulpal injection is the last option in the case of irreversible pulpitis, et cetera. Mandibular teeth are the most common teeth to be associated with the failing of anaesthesia and it is even more frustrating that it usually concerns the same patients, therefore the specialist tends to become nervous when the patient's name appears in the appointment book once again.

The main problem with failing anaesthesia lies with the dental curriculum, because dental schools do not allocate enough time, lectures and practical sessions to the subject. Often, the topic is interwoven within different subjects and it is assumed that students assimilate the information and will apply it successfully in the clinic. Infiltration anaesthesia, mandibular nerve block anaesthesia and intra-ligamentary anaesthesia are probably taught in every dental school as the "mainstream" techniques. However, what one should do in case of failure probably depends more on who is involved in teaching the course. A plethora of solutions are taught in dental school by different clinical teachers, ranging from combining amides and combining techniques to increasing the dosage or to injecting intraosseously. By the way, why is a carpule 1.7 or 2.2 millilitres in volume, irrespective if



Unlike nerve block anaesthesia, the key to provide successful dental local anaesthesia is intraosseous anaesthesia, which allows the anaesthetic to reach any nerves, no matter where they branched off. (Photograph: Nejron Photo/Shutterstock)

articaine or lidocaine is used and irrespective if plain or adrenaline-added solutions are used? There does not seem to be an answer.

The literature is inconclusive about which techniques should be used, however more and more evidence of anatomical variations in the innervation of teeth surfaces have been found, as dental and maxillofacial radiologists diagnosed and identified neurovascular canals on CBCT images. These variations in anatomy were unknown or overlooked for many years, which explains why, for over 100 years, dental local anaesthesia has not seen a lot of innovation. However, now that there is evidence of mandibu-

lar and maxillary anatomical variations in innervation, the knowledge should be applied to ensure profound and efficient dental local anaesthesia for all patients. Therefore, if local anaesthetic can be administered directly into the cancellous bone, the teeth will become anaesthetised irrespective of which nerve branch provided innervation to the teeth or a particular tooth. It sounds simple, and it is.

The principle of intraosseous anaesthesia is not new. It was first described in 1906 by Dr Cavaroz, who introduced direct injection into the cancellous bone as a better alternative to mandibular nerve blocks (known as the Halsted block). In fact,

every infiltration anaesthesia is an intraosseous anaesthesia. The reason why it works relatively well in the maxilla, in contrast to the mandible, is because the cortical plate is thin and porous in the maxilla.

Therefore, the cortical plate of the mandible requires to be perforated in order to administer the local anaesthetic successfully and efficiently. This technique can obviously also be used in the maxilla. Advantages of the technique include the minimal collateral anaesthesia (no numb lip and no numb tongue), the immediate onset of the anaesthesia, the relatively short duration of the anaesthesia (depending on the volume injected and the concentration

of the vasoconstrictor) and the fact that multiple quadrants can be treated in one visit, causing minimal discomfort for the patient. The key to success is the slow injection of the anaesthetic, which allows for the product to diffuse gently into the cancellous bone, causing profound and reliable anaesthesia of the pulp of the tooth, the tooth's periodontal ligament and the attached gingiva. Additional soft tissue anaesthesia is required if more elaborate treatment than simple restorative treatment is planned—a simple exodontia or deep calculus removal, for instance. The comfort of the patient is paramount and when the patients are comfortable, so will the dentist be.

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# Recent study investigates dental anxiety and dental behaviour in children

By DTI

**MANGALORE, India:** A key reason behind people not attending regular oral health check-ups can be anxiety stemming from their first experience in a dental setting as a child. In a recent study, researchers from India investigated whether there is an association between the temperament characteristics of children 3–5 years old, dental anxiety, and their dental behaviour. Results were gathered over three check-ups, with the aim of determining the effectiveness of behaviour management techniques such as tell-show-do and live modelling.



*In a recent study, researchers found that techniques like live modelling and tell-show-do are very effective in helping children manage dental anxiety. (Photograph: Creativa Images/Shutterstock)*

In the study, led by Dr Baranya Shrikrishna Suprabha from the Department of Paedodontics and Preventive Dentistry at the Manipal College of Dental Sciences, the researchers examined 100 children aged 3–5 years who were attending their initial dental visit accompanied by a parent.

Speaking to Dental Tribune International, Suprabha said, “When we reviewed the literature, the role of temperament in the dental behaviour of preschool children during the initial dental visit was unclear. Earlier studies had been carried out in older age groups of children and not necessarily during the initial dental visit. The association of temperament with dental anxiety, which has been shown to have an important role in the behaviour of the child in the dental clinic, was also investigated.”

During the initial oral examination of the children and their oral prophylaxis, the behaviour of the children was measured using the Frankl’s behaviour rating scale, and temperament was assessed using the Emotionality, Activity, Shyness Temperament Survey for Children. “The facial image scale used to assess the anxiety in our study has been shown to have good validity and reliability. Though we did not assess the validity and reliability again, all children responded easily to the scale,” explained Suprabha.

According to the study’s results, techniques like live modelling and tell-show-do are very effective in modifying a child’s behaviour. Additionally, children showed improvement in their behaviour with every subsequent visit. The researchers noted that proper assessment of chil-

dren’s behaviour helps the dentist to execute the required treatment plan in the most appropriate manner.

The study, titled “Association of temperament with dental anxiety and behaviour of the

preschool child during the initial dental visit”, was published on 6 February 2019 in

the European Journal of Oral Sciences ahead of inclusion in an issue.

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# New study adds to evidence of relationship between erectile dysfunction and periodontal disease

By DTI

**GUANGZHOU, China:** Growing concern over an association between erectile dysfunction and periodon-

tal disease has propelled more research into the subject in recent years. A new systematic review

and meta-analysis from the Jinan University in Guangzhou has found further evidence of a relationship

between the two. The results showed that men with periodontal disease were nearly three times

more likely to be at risk of erectile dysfunction.

The researchers conducted quality assessments and sensitivity analysis of the five case-control studies that met the eligibility criteria. These studies included data on over 200,000 participants. The findings suggest that periodontal disease should be included among the risk factors for erectile dysfunction.

According to the World Health Organization, severe periodontal disease was estimated to be the 11th most prevalent disease globally in 2016. Both periodontitis and erectile dysfunction have been linked to C-reactive protein (CRP), a substance produced by the liver in response to inflammation. A high level of CRP in the blood is a marker of an inflammatory condition, including inflammation of the arteries associated with heart disease. Scientists believe erectile dysfunction and periodontitis are linked in that this same type of inflammation could very well start in smaller blood vessels of both the mouth and penile area before reaching the larger arteries.

A previous study from the University of Granada in Spain, published in the *Journal of Clinical Periodontology* last year, showed just how serious it can get. In the study, CRP levels were higher in men who had periodontitis/erectile dysfunction than men without these health problems. Furthermore, men with chronic periodontitis were twice as likely to suffer from impotence compared with men who had healthy teeth and gingivae, suggesting that treating periodontal disease to reduce inflammation of the gingivae can result in improved erectile function.

The study, titled "Updated evidence of association between periodontal disease and incident erectile dysfunction", was published in the January 2019 issue of the *Journal of Sexual Medicine*.



Reducing the risk of periodontitis may help reduce the risk of erectile dysfunction. (Photograph: LightField Studios/Shutterstock)

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# Researchers present prototype of interactive device that can be worn in the mouth

By DTI

AUCKLAND, New Zealand: Scientists in New Zealand have developed ChewIt, a novel user-config-

urable interface device worn in the mouth. The prototype, which is no larger than a piece of chew-

ing gum, may soon allow people to answer their phones by simply biting on the soft ChewIt casing.

The research project in which ChewIt was developed was led by Dr Suranga Nanayakkara, an as-

sociate professor at the Auckland Bioengineering Institute who made international headlines in recent years with another prototype device, the FingerReader. Wearing it on a finger, the user points at words, such as those on the spine of the book or in a restaurant menu, and these are then translated to voice.

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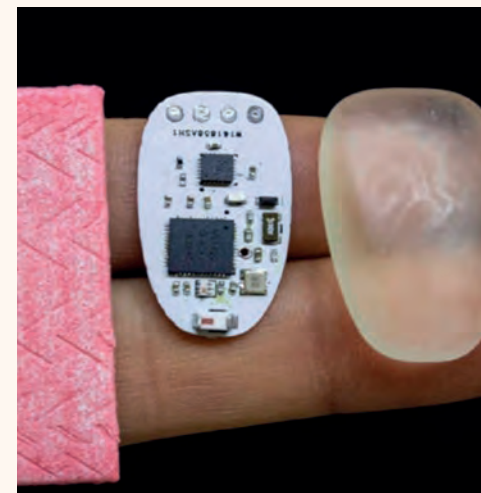
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The miniature ChewIt prototype shown alongside a piece of chewing gum. (Photograph: University of Auckland)

The custom-made flexible printed circuit board of the tiny ChewIt is fully encased, allowing users to pop it into their mouths. It allows for discreet and hands-free interaction with a phone, computer and smartwatch, among other devices, even while riding a bicycle. The wearer can use it to cancel a phone call or even to control a wheelchair. During the pilot test, users kept the device in their mouths for 30 minutes and reported no discomfort.

In his research, Nanayakkara wishes to address what he says is a mismatch between what technology has to offer and innate human behaviour. Owing to this, his research is focused on developing technologies that are more responsive to innate human behaviour instead of obliging humans to adjust to the requirements of the technology. "We want to design and develop systems that can understand the user, rather than us having to tell the technology what to do every time—technologies that can understand us much better than technology currently does," he said.

He considers such technologies "assistive augmentation": "It's when the system understands the abilities, behaviours and emotions of the user, and when the system is unobtrusive and integrated with our body or our behaviour," Nanayakkara explained. According to him, assisted augmentation should be concerned with strengthening and extending the users' physical and sensorial abilities while allowing them to do what they could not do before.



# dental bauer presents its new design world at IDS 2019

By OEMUS MEDIA

**COLOGNE, Germany:** Each year, annual design awards have recognised dental bauer's outstanding creative contributions to innovative practice design. This decades-old division has now been given a new name: DESIGN CONCEPT. As a symbolic example of a range of themes on offer, "blumarina" is an exclusive maritime-themed range which consists of an elegant treatment unit with matching furnishings.

Both elements of the concept were inspired by the legendary Riva Yacht and the associated carefree lifestyle on the Mediterranean coasts of Europe in the sixties. The Mediterranean dolce vita flair is combined with patient comfort and functionality, hygienic and technical standards all made in Germany, as well as stylish exclusivity.

The treatment unit inspires with its detail-rich, timeless elegance in combination with state-of-the-art modern technology. The ergonomic shape, the comfortable soft padding with its aesthetic stitching



The exclusive "blumarina" dental line is aimed at those who appreciate sharing the experience of the aesthetics of individual design with their patients and would like to distinguish their practices. (Photograph: OEMUS MEDIA)

ing and all-round upholstery piping, and the premium mahogany and maple wood armrests all perfectly

match the special maritime colour livery of pure white, pearl night blue and turquoise. If the cus-

tomers desires, other colour combinations are also possible. Chrome elements add further highlights to

the yacht look. A light-hearted gimmick is an optional motorboat sound when the reclining position is adjusted.

White body, blue stripes, rosewood and stainless steel—the yacht design of the "blumarina" treatment unit seamlessly integrates with that of its furniture system. The fronts and the worktops not only inspire with their maritime design features, but also functionally fulfil all of the hygienic requirements of a modern dental practice. The nautical look in form and fabric is finished with recessed LED lights in high-gloss varnished wood.

The new design world from dental bauer presents a revolutionary product for dentistry, underlining the company's passion for transforming the individual design dreams of its customers into reality. Presented well on schedule at IDS, "blumarina" can be ordered as a limited edition from April onwards.

# Researchers discover new material that could make dental fillings more durable

By OEMUS MEDIA



Dr. Carmem Pfeifer from the Oregon Health and Science University School of Dentistry has developed a doubly resistant filling material that may help reduce dental visits and prevent extensive treatment. (Photograph: OHSU/Kristyna Wentz-Graff)

**PORTLAND, Ore., U.S.:** A recent study has found that a compound used to make car bumpers more robust and protect wood decks

could make dental fillings last twice as long. The results of the investigation will help design fully formulated adhesives to be tested in

clinically relevant conditions, and as a result, dental patients could reduce the number of visits to the dental office.

A team of researchers at the Oregon Health and Science University (OHSU) School of Dentistry in Portland has created a filling material that is twice as resistant to breakage than conventional fillings. The new filling uses the additive thiourethane, which can also be found in protective coatings for cars and wood decks.

The team has also developed an adhesive that proved to be three times stronger after six months in use than the adhesives that are currently used to keep fillings in place. Combined, the new adhesive and the composite are designed to make more enduring dental restorations.

"Today's dental restorations typically only last seven to ten years before they fail," said Dr. Carmem Pfeifer, an associate professor in the Department of Restorative Dentistry at the school and corresponding author of the studies. "They crack under the pressure of chewing, or have gaps form between the filling and the tooth, which allow bacteria to seep in and a new cavity to form," Pfeifer said. "Every time

this happens, the tooth under the restorations becomes weaker and weaker, and what starts as a small cavity may end up with root canal damage, a lost tooth or even life-threatening infections," she continued.

The dental adhesive uses a type of polymer, known as (meth)acrylamide, that is much more resistant to damage in water, bacteria and enzymes in the mouth than the standard adhesives currently used in the dental industry. The composite material uses thiourethane, a chemical compound that can better withstand chewing.

The study describing the adhesive is titled "Use of (meth)acrylamides as alternative monomers in dental adhesive systems" and was published online in Dental Materials on Feb. 27, 2019, ahead of inclusion in an issue.

The study on the material is titled "Toughening of dental composites with thiourethane-modified filler interfaces" and was published online on Feb. 19, 2019, in Scientific Reports.



# Prof. Jörg Strub receives the fifth P-I Brånemark Award

By DTI

The fifth annual P-I Brånemark Award for Lifetime Achievement in Dentistry has been given to Prof. Jörg Strub of the University of Freiburg in Germany. Strub received the prestigious accolade in absentia, with his colleague and friend Dr Kenneth Malament accepting it on his behalf.

At the award ceremony, Malament reminded an assembly of Strub's colleagues and friends that

he "is an individual who has put his whole life into dentistry—there is simply no one like him. He is the best of his generation," Malament said.

Mark Ferber, founder of Channel3, which presents the award, told Dental Tribune International that "Jörg Strub has perfectly represented, throughout his career, the five characteristics of Prof. Bråne-

mark, on which the award is based. Dr Strub is a scientist, a clinician, an educator, a humanitarian, and a sage."

Strub received his DDS, Dr. Med. Dent. and Dr. Med. Dent. Habil. degrees from the University of Zurich in Switzerland in 1975 and 1985, respectively. Since 2005, he has been Associate Dean for Clinical Affairs at the University of Freiburg.

Established in 2015 in honour of Swedish physician and father of modern implantology Prof. Per-Ingvar Brånemark (3 May 1929 to 20 December 2014), the eponymous annual award recognises exceptional clinicians who have advanced dentistry for the well-being of society. The first award was given in 2015 to Dr Myron Nevins of Boston in the US. In 2016, Dr Tiziano Testori of Lake Como in Italy received

the second award. Dr István Urbán of Budapest in Hungary received the third award, in 2017. The fourth award was given to Dr Michael Cohen, founder of the Seattle Study Club, in 2018.

This year's award was presented in the OEMUS MEDIA and Dental Tribune International IDS media lounge on Thursday.



Dr Kenneth Malament (left) accepting the P-I Brånemark Award for Lifetime Achievement in Dentistry on behalf of Prof. Jörg R Strub, with Mark Ferber (middle), founder of Channel3, and Dental Tribune International CEO Torsten Oemus. (Photo: Luke Gribble, DTI)



Attendees at the Channel3 right held at the OEMUS MEDIA/Dental Tribune International booth. (Photograph: Luke Gribble, DTI)



From left: Dr Kenneth Malament receiving the P-I Brånemark Award for Lifetime Achievement in Dentistry on behalf of Prof Joerg R Strub, with Mark Ferber (middle) founder of Channel3 and Dental Tribune International CEO Torsten Oemus. (Photograph: Luke Gribble, DTI)



Dental Tribune International CEO Torsten Oemus with attendees from the Channel3 booth party. (Photograph: Luke Gribble, DTI)



Dr Sarah Fitzharris, founder of the Fitz Fahey Academy, looks on during the award ceremony. (Photograph: Luke Gribble, DTI)



Action shot from the Channel3 right held at the OEMUS MEDIA/Dental Tribune International booth. (Photograph: Luke Gribble, DTI)



Prof Tiziano Testori (middle) from the Lake Como Institute with attendees at the Channel3 booth party. (Photograph: Luke Gribble, DTI)

## ROOT SUMMIT community meets at the 38<sup>th</sup> IDS in Cologne

By DTI

On Thursday, friends and members of the ROOTS SUMMIT community gathered at the 38<sup>th</sup> IDS in Cologne for coffee and croissants. The brunch provided an opportunity to discuss next year's meeting, which will take place at the Cubex Centre Prague from 21 to 24 May in Prague in the Czech Republic.

After the success of ROOTS SUMMIT 2018, the anticipation for next year's event is high. Co-chairman Stephen Jones said, "Before ROOTS SUMMIT 2018 had finished, we began planning ROOTS SUMMIT 2020. We knew we were going to have a challenge matching the quality and depth of the programme we had in Berlin, but our scientific

chairman, Dr David Jaramillo, has managed to put together another outstanding programme. We have nine of the top speakers in endodontics, and we also have the pleasure of having Dr Maxim Belograd give us his perspective on how to increase your endodontic success from a restorative point of view."

Other notable speakers at ROOTS SUMMIT 2020 include Dr Jaime Silberman and Prof. Matthias Zehnder. A final programme will be available on [www.roots-summit.com](http://www.roots-summit.com) within the next few days, and registration will open on 21 May 2019. More information about the event can be found on its Facebook page (@roots-summit2020).



From left: ROOTS SUMMIT Co-chairman Dr Freddy Belliard, Event organiser Sarah Schubert and ROOTS SUMMIT Co-chairman Stephen Jones (Photograph: Robert Strehler)



# Interview: “We definitely passed a tipping point for 3-D printers”

By Brendan Day, DTI

Powered by 3D Systems' proprietary Figure 4 technology, the NextDent 5100 is a high-speed dental 3-D printer designed to save time for both patient and practitioner. Dental Tribune International spoke with Rik Jacobs, dental vice president and general manager at 3D Systems; Sebastiaan Cornelissen, CEO of Cordent and Core3dcentres; and Dr Michael Scherer, an American prosthodontist, about the NextDent 5100 and future trends in dentistry.

**Is the NextDent 5100 designed specifically with the dental lab in mind, or can it be used in a dental practice as well?**

**Rik Jacobs:** Essentially, I designed this product to be used by both labs and clinicians with success.

**Sebastiaan Cornelissen:** We found that the most important thing was to have a system that can incorporate multiple machines and multiple materials if necessary. This flexibility was the main feature that we were looking for, and the NextDent 5100 delivers this.

**Dr Michael Scherer:** For a clinician like myself, there's been an embrace of 3-D printing in recent years. However, it's always been the lower-cost models that have been prioritised. With the multiple materials and extremely fast printing that the NextDent 5100 offers, I think that clinicians can now offer a realistic chairside solution for patients.

**What are the benefits of the NextDent 5100 for dental labs?**



From left to right: Dr Michael Scherer, Rik Jacobs (dental vice president and general manager at 3D Systems) and Sebastiaan Cornelissen (CEO of Cordent and Core3dcentres) with 3D Systems' NextDent 5100. (Photograph: Brendan Day, DTI)

**Cornelissen:** In the dental lab, you have similar time pressure issues to a dental practice. You need to be able to produce things fast, in multiple colours and often in large quantities. To be frank, these are all easily achievable with this printer.

Often, a dentist will send some scans to us so that we can quickly create a smile design for the dentist to print a mock-up of in his or her office. Though we are based in the

Netherlands and have clinicians working with us from Germany, the NextDent 5100 allows for this entire procedure to be conducted in less than 2 hours.

**What has the feedback been since the launch of this printer? What have customers most liked about it?**

**Jacobs:** What was important for us, besides what these gentlemen have already mentioned, was that the printer have a high level of

accuracy. With ten years of experience in the 3-D dental printing industry, I've learnt that a lot of printers work fine in the beginning but lose their accuracy over time. When 3D Systems acquired my company, we decided to make sure that our printer would work without issue, day in and day out, for at least three years. Flexibility, speed, accuracy and, ultimately, affordability of the machine and the materials—these, along with train-

ing and ongoing support from our outstanding resellers, are the foundations of the NextDent 5100.

We got a lot of feedback from users of this printer, like Michael and Sebastiaan, and thankfully, our R & D team in San Diego really listened to what they asked for, what the market asked for. I think this is what our company should always do: listen carefully to our customers and deliver what they need and want.

**Are software updates included?**

**Jacobs:** Automatically. As long as the user is connected to the Internet, he or she will be able to have the latest updates automatically downloaded to the printer.

**It's predicted that, within three to five years, more than 50 per cent of dental labs globally will have an in-house 3-D printer. What, in your opinion, is driving this growth?**

**Jacobs:** Well in 2018, we definitely passed a tipping point for 3-D printers here at 3D Systems. Thanks to easier registration, certification, improved ease of use, and a range of other factors, it has become much more achievable to integrate a 3-D printer into one's daily workflow.

**Scherer:** Clinicians are now expecting dental labs to be digital and to have printing capabilities. It's no longer a case of whether a lab will take your files, but rather if they print themselves or still outsource it. That's how fast 3-D printing has grown in dentistry.

# Interview: “We intend to ultimately develop a daily use oral care product with a natural substance”

By DTI



Members of the research team responsible for the development a new product to help fight dental caries. From left to right, Drs Shaneen Leishman, Nebu Philip and Laurence Walsh. (Photograph: Dr Patricia Wright)

The fight against dental caries has produced a number of innovative ways in which patients can protect and improve their oral health. After much interest in a recently published article on a study into the potential use of berry extract to combat decay-causing bacteria, Dental Tribune International spoke with lead researcher Dr Nebu

Philip, from the University of Queensland in Australia, to discuss this new discovery in more detail.

**Dr Nebu, the study sounds very interesting. How did the idea for the research topic arise, and who are you working with?**

We were interested in develop-

ing natural products that could potentially be used to complement fluoride in dental caries prevention. Although there has been extensive literature suggesting the use of natural products for preventing dental diseases, the vast majority of natural product research studies in dentistry are laboratory-based and have not progressed to clinical usage.

I am part of the broad research group called Advanced Materials and Technologies, which is headed by Dr Laurence Walsh. Under this group we had a sub-group focusing on natural products and dental caries – which includes Drs Walsh, Leishman, Bandara and myself. I was the lead researcher of the natural product study, with the group coming together three years ago at the beginning of my PhD programme.

**What was the basis of your research concept?**

We sought to identify an appropriate natural product. Dark-coloured fruit berries are known to contain a variety of phytochemicals beneficial to health. The availability of commercial fruit berry extracts with standardised phytochemical concentrations offered the possibility of testing these polyphenol-rich extracts against key cariogenic bacterial virulence properties. We progressed from a series of laboratory studies to a double-blinded randomised controlled trial in high caries-risk patients. We have presently completed all these studies and are planning our next clinical trial in a larger cohort of patients.

**What do you think the most interesting results were?**

The ability of the berry extracts, especially the cranberry extract, to

significantly inhibit *Streptococcus mutans* virulence without affecting bacterial viability was probably the most interesting result. This suggests the possibility of incorporating the cranberry extracts into a daily use oral care product, for example a mouthwash or dentifrice, to reduce cariogenic virulence without affecting health-associated bacterial species in dental plaque, an important advantage over commonly used synthetic biocides, like chlorhexidine.

**Do you have further research plans to develop a new oral health product?**

The results of our first clinical trial were encouraging. After further clinical studies, we do intend to ultimately develop a daily use oral care product with a natural substance incorporated into it to protect against dental caries. Watch this space!