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Prof. Dr. Nazeer Khan's citation count crosses 5,000

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Periodontal status may play role in COVID-19 severity

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Renowned dental experts and global presence mark virtual edition of UHS conference

DT Pakistan Report

LAHORE - Despite the effects of the global COVID-19 pandemic on healthcare, dental experts see the crisis as an opportunity to rethink the future of dentistry and address system-level failures.

They stressed that another wave of scientific discovery and innovation should come along with the second wave of coronavirus. International

than being isolated and separated from mainstream healthcare, this crisis had clearly shown that dental professionals could be integrated into the more comprehensive system.

“The challenge ahead is to delineate the clinical roles of dental personnel in a more integrated model of care,” Dr Edwards remarked. He also said that dentists had a substantial effect in supporting health service delivery during the pandemic and had, therefore, developed new skills and

Dalhousie University, Canada observed that current restrictions on aerosol-generating procedures provided an opportunity to re-orientate dental care towards a less invasive and more preventive approach, one in which the dental team worked in partnership to tackle the shared risks for oral diseases and other non-communicable diseases.

“This is also a time to stop delivering unnecessary and ineffective treatments. A perfect example of this

Prof Khalid Almas among world's top 2% scientists

DT Pakistan Report



KARACHI - Professor Khalid Almas has been figured in the list of the world's top two per cent scientists in a global list issued by the United States' Stanford University.

The global list, compiled by Prof John Ioannidis and his team, carries names of 159,683 people from all scientific disciplines.

All these authors have been selected based on an international evaluation of their research papers and classified based on career-long citation impact until the end of 2019 as well as for their citation impact in a single year (2019).

Dr Khalid Almas, Professor, Preventive Dental Sciences Department, College of Dentistry, Imam Abdulrahman Bin Faisal University has been figured in the list for career-long citation impact. A report on this list has been recently published in *PLOS Biology*.

Dr Khalid completed his BDS in Pakistan and currently working as Professor, Preventive Dental Sciences Department, College of Dentistry, Imam Abdulrahman Bin Faisal University, the Kingdom of Saudi Arabia.

and local medical and dental experts were addressing Pakistan's first virtual online dental moot held at the University of Health Sciences (UHS). The theme of the conference was 'Redefining Trends in Dentistry' where speakers from the UK, Saudi Arabia, New Zealand, Canada, Malaysia, Palestine, Hong Kong, Turkey, France and Pakistan presented their papers.

Addressing the closing ceremony of the three-day conference recently, Dr Andrew Edwards, Vice President, Royal College of Physicians and Surgeons Glasgow, UK said that rather

clinical knowledge in the process.

Prof Paul Anderson, Queen Mary University, London said that the pandemic had exacerbated socioeconomic inequalities and would undoubtedly worsen oral health inequalities. He was of the view that dental care systems now needed to be more responsive to the needs of their local populations and prioritise care for groups with a high need such as low income, marginalised and vulnerable groups, including those with multiple morbidities.

Dr Nader Hamdan, Assistant Professor of Periodontology,

is the routine provision of tooth scaling and polishing, a procedure that does not have an evidence base and is a costly waste of resources," Dr Hamdan stressed.

Prof Margery McMahon, Head of School of Education, University of Glasgow, UK said that radical reform of oral healthcare systems would require brave and bold decision-making from professional leaders. There had been a paradigm shift in how universities and professional organisations were led and how they organised themselves to deliver

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Prof. Dr Nazeer Khan's citation count crosses 5,000

DT Pakistan Report

KARACHI - Dr Nazeer Khan, Professor of Biostatistics & Director of Research, Jinnah Sindh Medical University has recently crossed 5,000 attributed citations in the Google database.



According to Google Scholar, 5,010 citations has been attributed to Dr Nazeer Khan.

Google Scholar is a freely accessible web search engine that indexes the full text or metadata of scholarly literature across an array of publishing formats and disciplines and has been regarded as the world's largest academic search engine.

Royal College of Surgeons honours Dr Noor ul Wahab

KARACHI - President Pakistan Dental Association (PDA), Karachi Chapter was recently awarded by a Fellowship in Dental Surgery of the Royal College of Surgeons of England (FDSRCS England). The fellowship has been a Dental postgraduate professional qualification which is bestowed by the Faculty of Dental Surgery of the Royal College of Surgeons of England.



Continued on Page 11

Dental house officers of KMDC unpaid for 9 months

DT Pakistan Report

KARACHI - Dental house officers of Karachi Medical and Dental College (KMDC) have been deprived of their salaries for the past nine months and protested against the administration outside Press Club.

Talking to Dental News, demonstrators told that dental house officers performed their duties wholeheartedly during the pandemic lockdown. House officers told that they were appointed in dental OPDs of Abbasi Shaheed Hospital, Maxillofacial Surgery Ward and Corona Filter Clinic.



Photo: DT Pakistan

Despite working, house officers have not received the announced Corona Virus Risk Allowance and have not been paid for nine months.

The protestors said that they did not receive the Rs 45,000 salaries granted by the Sindh government and did not receive additional risk allowance of Rs 30,000.

Protestors demanded Prime Minister of Pakistan, Chief Minister of Sindh and senior officials of the Health Department to take notice and pay them their due Corona Risk Allowance as well as their salaries.

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Gandhara University holds post-graduate course on effective communication skills

PESHAWAR - A post-graduate course for trainee medical officers was recently held at Sardar Begum Dental College. The event was a joint venture of Pakistan Society of Physicians and Gandhara University. The course aimed to highlight the importance of effective communication in patient's management. The facilitators of the course included Dr Aleina Badshah, Dr Awais Naeem, Dr Samir Kabir and Dr Jibran Umar Ayub. The facilitators shared their experience and gave constructive feedback to the participants.



Photos: DT Pakistan



a consent, genetic counselling, breaking confidentiality, drug errors were discussed at length. There was also some focus on history taking of common symptoms that are encountered in the clinical setting.

Rashid Ahmed Khan Tahirkheli, vice-chancellor, Gandhara University was the chief guest of the event. He appreciated the efforts of the organisers. He also emphasised on practical communication skills, being the cornerstone of clinical management and suggested that we still need a lot of improvement in this field.

The event concluded with the distribution of certificates and shields amongst the participants, organisers and faculty. **-PR**

The course focused on various aspects of communication like addressing patient concerns, maintaining their welfare and developing sound clinical judgement. Common scenarios like breaking the bad news, end of life care, obtaining

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 ‡As compared with 1% potassium nitrate. For instant relief, apply directly to the sensitive tooth and gently massage for 1 minute.
 Reference: 1. Liu Y et al. J Clin Dent. 2011;25(6):102-105. 2. Nishio S et al. J Clin Dent. 2009;25(5):102-105. 3. Akbar F et al. J Clin Dent. 2008;22(5):102-105. 4. Akbar F et al. J Clin Dent. 2008;22(5):102-105. 5. Nishio S et al. J Clin Dent. 2009;25(6):102-105. 6. American Dental Association. ADA Accepted Seal of Acceptance. 2010. www.fda.gov/cdrh/oc/toothpaste.html



by Dr Muattar Hanif

Explanation given to patient after procedure, is an excuse!

Dr Muhammad Ahmad Javaid

Dr Muhammad Ahmad Javaid graduated from the University of Health Sciences Lahore, Pakistan in 2009. Following graduation, he moved to Canada to study for a Master's in Dental Sciences from the McGill University, Canada.

After completing his graduate studies, Dr Javaid then enrolled in Diploma in Periodontics, a three-year clinical residency program with a focus on advanced surgical techniques in Periodontics and Implant Dentistry, at The University of British Columbia, Canada. Simultaneously, he also started his second Master's in Craniofacial Sciences at The University of British Columbia. He also cleared the Fellowship of Royal College of Dentist Canada (RCDC) Exam in Periodontics and is a Fellow Elect with the RCDC.

Dr Javaid has published numerous international articles and has peer-reviewed international journals and has contributed to multiple book chapters in internationally published books in the field of periodontics and implant dentistry. He is currently working as Clinical Assistant Professor, Department of Periodontics, University of Alberta, Canada. Recently he sat down with Dental Tribune Pakistan to talk about his journey as a practitioner and discuss some pointers pertaining to Periodontology.

Dental Tribune Pakistan: What made you choose periodontology?

Dr Ahmad: During my graduation, all the specialities were very well established in Pakistan, except for Periodontology, in which we didn't have a single fellowship program in Pakistan. Though we have already learned almost all dentistry facets, I knew it was the periodontology that touched my heart the most during my undergraduate studies. It all happened during my final year; I was genuinely intrigued by the field. My mentor, Dr Khurram, was the very reason who influenced me to pursue periodontology more. He is one of the pioneers who brought periodontology to Pakistan. He has always been a role model for me. The rest of the dental specialities in Pakistan are indeed top-notch, but it needs more focus and attention when it comes to periodontology. And that's how my interest was developed.

“Supervisors and mentors play a pivotal role in developing interest in any field. They are more like role models for the young aspiring dentists”

DTP: What are the biggest challenges that the field of Periodontology is facing in Pakistan?

DA: The first thing I feel is that the domain of periodontology requires time and attention. The actual spotlight was shone on periodontology back in 2016. Though baby steps are taken, I can assure you that the speciality of periodontology is on the right track. Secondly, in my experience, I felt that supervisors and mentors play a pivotal role in developing interest in any field. They are more like role models for the young aspiring dentists. We need such instructors who develop interests in the young inquisitive minds of undergraduate students. But it's just a matter of time, I believe, that the field will get the due recognition that it deserves.

DTP: Are there opportunities available for fresh graduates abroad in the domain of Periodontology?

DA: We all are grown up in a country where

Myth Busters

DTP: Can scaling makes teeth weak?

DA: No! Please have your teeth cleaned. Scaling doesn't make your teeth week.

DTP: Can scaling increase teeth sensitivity?

DA: It may cause teeth sensitivity. But then again, it depends on case to case. However, the sensitivity doesn't stay long and can be subsided using toothpaste containing strontium or potassium salt. But then again, we need to compromise on temporary discomfort to have permanent benefits. The same goes for scaling.

DTP: Which toothpaste is perfect for sensitivity?

DA: You are putting me in trouble [laughs]. I don't believe that the type of toothpaste makes any difference. It's the brushing technique that matters more.

DTP: Tooth whitening vs. tooth cleaning, your preference?

DA: Tooth whitening is an entirely different thing, and one can only opt for if they are Instagrammers! But tooth cleaning should be an utmost priority because I have seen that people, even in their 40s, have lost all their teeth due to lack of cleaning.

DTP: Is implant surgery a painful procedure?

DA: In my experience, I am evident to my patients that the kind of experience one has during extraction is way less discomforting for an implant procedure.

DTP: Do implants fail very often?

DA: It depends. First is survival, like whether the implant has been integrated into the bone solidly. The other is a success, which means that even if you apply pressure to the implant, it stays in the same place even without any complication. There are stringent criteria set by experts, which says that if the implant meets 80% of those criteria, it's a successful one. Hence, in a nutshell, implants are the best substitute for a natural tooth, but they can never compensate for losing a natural tooth.

opportunities are limited, and candidates are many. So, thinking out of the box and being pushed to strive for greatness is the only way to counter such heavy competition. In my second year, I developed this hobby, where I used to search for dental colleges and programs offered abroad. I highly recommend students prepare, even in their free time, and do their bit of research. Be informed well, especially about what you are aiming for.

If I speak about Canada, I can tell that it's a land of opportunity. The scope of periodontology here is immense. But just like any other domain, the competition here is insane. Not just for periodontology, but any field. Yes, the population here is less than Pakistan, but then these people who have migrated here possess great expertise and mind-set skills. Thus further raising the bar.

“Dentists usually create high expectations for the patient, which will never work. Explain before procedure rather than post-procedure because then that's not an explanation, it's an excuse”

DTP: Do you think there's a lack of a multidisciplinary approach in Pakistan?

DA: Everything has its own set of pros and cons. In Pakistan, private practice works in a limited financial circumference. Dentists have to pay bills, rent, and provide a salary to staff. They have to manage things within earning. No matter how much we like or not, a multidisciplinary approach is not a choice. It is what they have to do. Hence, when a patient comes and wants a root canal treatment, one cannot let that patient go. They have to cater to that patient, despite being an expert in that domain or not. These patients are the source of income for private dentists.

In Canada, a specialist cannot practice general dentistry. The system followed here in Canada is referral based. If specialists start doing general practice, then instead of referring patients to specialists, these general dental practitioners will turn into competitors.

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new

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Colgate laboratory tests show toothpaste and mouthwash inactivate 99.9% of the virus that causes COVID-19

Clinical research program underway to validate potential of oral health products to slow spread of the virus

Laboratory studies show that toothpastes containing zinc or stannous and mouthwash formulas with cetylpyridinium chloride (CPC) neutralize the virus that causes COVID-19 by 99.9%. The studies are part of a Colgate research program that includes clinical studies among infected people to assess the efficacy of oral care products in reducing the amount of the virus in the mouth, potentially slowing the transmission of the SARS-CoV-2 virus.

In the laboratory studies -- the first to include toothpaste -- Colgate Total and Meridol toothpaste neutralized 99.9% of the virus after two minutes of contact. Colgate Plax, Colgate Total and Colgate Zero mouthwashes were similarly effective after 30 seconds. The studies, completed in October, were conducted in partnership with Rutgers University's Public Health Research Institute and Regional Biosafety Laboratories.

The results suggest that some toothpastes and mouthwashes may help reduce the spread of SARS-CoV-2, the virus that causes COVID-19, by temporarily reducing the amount of virus in the mouth. The virus spreads through respiratory droplets or small particles produced when an infected person coughs, sneezes, sings, talks, or breathes, according to the U.S. Centers for Disease Control and Prevention.

"While brushing and rinsing are not a treatment or a way to fully protect an individual from infection, they may help to reduce transmission and slow the spread of the virus, supplementing the benefit we get from wearing masks, social distancing and frequent hand washing," said Dr. Maria Ryan, Colgate's Chief Clinical Officer. "We're at the early stages of our clinical investigations, but our

preliminary laboratory and clinical results are very promising."

Said Dr. David Alland, Chief of Infectious Diseases and Director of the Center for COVID-19 Response and Pandemic Preparedness, who led the Rutgers study along with colleagues Drs. Pradeep Kumar and Riccardo Russo: "While we do not yet know the contribution of SARS-CoV-2 virus originating from the mouth to COVID-19 transmission, saliva certainly can contain amounts of virus that are comparable to that found in the nose and throat. This suggests that reducing virus in the mouth could help prevent transmission during the time that oral care products are active."

Concurrent to the laboratory study, a Colgate-sponsored clinical study involving some 50 hospitalized subjects with COVID-19 was conducted at the Albert Einstein Institute in São Paulo, Brazil. This study demonstrated the ability of certain Colgate mouthwashes to substantially reduce the amount of the virus in the mouth temporarily. The researchers plan to share their findings in early December. Additional Colgate-supported clinical research studies on toothpaste and mouthwashes are in early stages at Rutgers, the Einstein Institute, and at the University of North Carolina Adams School of Dentistry, with some 260 people with COVID-19 participating in these studies.

"Colgate is collaborating with numerous investigators throughout the globe to conduct clinical research to explore the potential of oral care products to reduce oral viral loads as a risk reduction strategy," Dr. Ryan said. "We think oral care has a role to play in fighting the global pandemic, alongside other preventive measures."

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dental expert, Colgate is committed to leading in science and to ensuring that its products address health challenges and meet consumers' needs. For more information about the effects of oral hygiene on overall health and additional insights on mask mouth and other topics, visit www.colgate.com.

About Colgate-Palmolive:

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www.colgatepalmolive.com.
CL-C -PR

Residents of RCD attend IMM TOACS preparatory course

PESHAWAR - IMM (intermediate module) Task-Oriented Assessment of Clinical Skills (TOACS) preparatory course was recently arranged at Rehman College of dentistry (RCD), Peshawar. The chief guest of the event was Dr Bakhtiyar Zahid, Dean, Rehman Medical Institute (RMI).



Photo: DT Pakistan

The course was attended by around 25 orthodontic residents across the province. The examiners included Prof. Dr Col Hameed Ullah Jan, Dr Amber Saeed Khan from Abbottabad International Medical and Dental College, Dr Usman from Fauji Foundation Hospital, Dr Saood from Khyber College of Dentistry (KCD), Dr Samia from City hospital, Dr Imran Tajik and Dr Nazir from SBDC, Dr Sohrab Shaheed Dr Nasir Mushtaq, Dr Asif Qureshi and Dr Muhammad Khan from RCD and Dr Shahab Adil from Peshawar Dental College (PDC).

At the start of the session a detailed orientation was given to the residents about IMM exam and TOACS stations by Dr Ayesha Iftikhar. Later participants took the IMM TOAC exam. They were provided with thorough guidance and feedback pertaining to their queries. -PR

RCD installs inhalation sedation unit

PESHAWAR - Rehman College of Dentistry (RCD) recently announced the successful installation of the inhalation sedation unit. The unit is one of its kind in the province of Khyber Pakhtunkhwa.



Photo: DT Pakistan

Dr Madeeha Bangash, Consultant and Head of Department of Paediatric Dentistry, RCD along with assistance of Dr Ifra Sana Khattak, Internee, Department of Paediatric Dentistry, RCD

Continued on Page 11



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Department of Paediatric Dentistry celebrates second anniversary

KARACHI - The faculty of Department of Paediatric Dentistry, Ziauddin College of Dentistry (ZCD) recently celebrated the second anniversary of its establishment.

The Department of Paediatric Dentistry was established in 2018 as a subspecialty of Department of Operative Dentistry under the supervision of Dr Mervyn Hosein, Dean, ZCD and Dr Asmat Jameel, Head of Department of Operative Dentistry, ZCD.

The faculty of Department of Paediatric Dentistry included Prof. Dr Asmat Jameel, Head of Department, Dr Sadaf Ali, Senior Registrar and Dr Farwa Shafiq, Dr Farah Amin and Dr Zain Ahmed Farooqui, lecturers.

The department organised free dental check-ups, and all the paediatric patients were given oral hygiene instructions and counselling. Gifts, balloons and toothpaste samples were also distributed among patients.

Later, the cake cutting ceremony was held in the presence of Dr Nida Hussain, Pro-Chancellor, Ziauddin University (ZU).

Engr. Capt (R) Syed Waqar Hussain, Registrar, ZU, Dr Nuzhat Hassan, Acting Principal, Ziauddin Medical College Dr Mervyn Hosein Dean, ZCD and Prof. Dr Tasleem Hosein, Principal, Fatima Jinnah Dental College joined along with all the Heads of the Departments of ZCD. **-PR**



Photos: DT Pakistan

Sir Syed Dental College holds a lecture on restorative dentistry

KARACHI - Sir Syed Dental College recently organised a lecture to highlight ways to minimize post-operative pain during root canal treatment.



Photo: DT Pakistan

Prominent dental surgeon and academician conducted the lecture, Dr. Zain Rauf titled, 'Effects of occlusal reduction on post-operative pain after root canal treatment of teeth with irreversible pulpitis in clinical practice.' Dr Zain emphasised the importance of restorative dentistry in clinical practice amongst the participants. Furthermore, he created awareness and promoted restorative procedures in the hospital and private clinical practice.

Prof. Dr HR Sukhia, Sir Syed Dental College, also spoke on occasion. He highlighted the advantages of root canal treatment and orthodontic braces' success on root canal treated teeth.

Participants much appreciated the dental faculty's efforts in organising the event and promoting medical and dental education seminars in the college. **-PR**

SSCMS conducts oral awareness program

KARACHI - Sir Syed College of Medical Sciences (SSCMS), Dental Section recently conducted an oral awareness program for



Photo: DT Pakistan

general medical practitioners. The event organised by the Department of Community Dentistry, SSCMS highlighted the oral health complications in children.

Dr Ali Raza and Dr Sandhiya Iqbal briefed the audience on the importance of promoting oral health in the community. Prof. Dr HR Sukhia, Principal, Dental Section, SSCMS also

Continued on Page 11

Experts conduct workshop on dental implant

KARACHI - A workshop on dental implant placement titled, 'Basics of implant placement and prosthodontic management' was held at Dental Solutions Clifton (DSC)- Center for Dental Education.

The theme of the workshop was to highlight necessary implant placement skills, impression-making and placement of the prosthetic component. The surgical component of the workshop was covered by Dr Abdullah Salman, Assistant Professor, Baqai Dental College and prosthetic component was covered by Dr Naseer Ahmed, Associate Professor, Altamash Institute of Dental Medicine.

Dr Adil Bin Irfan, Managing Director, Dental Solutions Clifton (DSC), welcomed participants and speakers and spoke about the importance of continuing dental education. He said that fresh graduates and upcoming dentists

should keep themselves updated regarding dentistry, and they should attend such workshops.

Dr Abdullah Salman gave a brief introduction to implant dentistry. He described the surgical aspect of implant placement to the audience and explained every step in detail.

Dr Naseer spoke about different types of crowns and impression techniques for dental implants.



Photos: DT Pakistan

Their courses were followed by a question and answer session.

Later, a demonstration on how to place the dental implant and how to take its impression was given.

The session also contained a hands-on component in which participants placed dental implants on goat head under supervision.

Individual attention was given to



every participant, and more emphasis was given to the participants' handling techniques. After the exercise, Dr Umer Bin Irfan, Chief Executive Officer, Dental Solutions Clifton, thanked the

participants, speakers. He said that DSC had a vision and mission to provide knowledge to undergraduates and fresh graduates on areas which were neglected in the past.

In the end, certificates were distributed among the participants, and shields were presented to the speakers. **-PR**

By Brendan Day, Dental Tribune International

LOS ANGELES, U.S. - The link between periodontal disease and systemic conditions such as cardiovascular disease is, by now, well established in the scientific literature. A new review study has now suggested that untreated periodontal disease may be indirectly related to the intensity of COVID-19-related complications, highlighting the need for good oral health during these difficult times.

As outlined in the review, a recent study conducted in the German city of Munich found that elevated levels of interleukin-6 (IL-6), a pro-inflammatory cytokine, acted as a powerful predictor for respiratory failure and the eventual need for mechanical ventilation among patients who had been hospitalized with COVID-19. When left untreated, periodontal disease frequently leads to an increase of this pro-inflammatory cytokine. According to Dr. Shervin Molayem, a Los Angeles-based periodontist and co-author of the review, it is therefore "not an overstatement to conclude that periodontal disease can increase the risk of respiratory complications in COVID-19 patients." Conversely, lowering IL-6 levels can potentially reduce the likelihood of these complications from occurring, he added.

"From the existing literature, we know that simply

Periodontal status may play role in COVID-19 severity



A new review study has concluded that patients with periodontal disease may have an increased risk of developing COVID-19-related respiratory complications. (Image: zlikovec/Shutterstock)

by performing a scaling and root planing procedure on a patient with periodontal disease, we can lower IL-6 levels by, on average, 3 pg/ml," Molayem told Dental Tribune International.

Oral hygiene correlates with reduced complications

As reported by DTI back in June, a study published in the *British Dental Journal* highlighted the

importance of improved oral hygiene during a SARS-CoV-2 infection, since it can reduce the bacterial load in the mouth and the associated risk of a bacterial superinfection. Patients reported to have a severe case of COVID-19 had associated higher levels of inflammatory markers and bacteria, leading the study's authors to conclude that poor oral hygiene may be a risk factor for COVID-19 complications.

In the view of Molayem, provided that they are practicing appropriate infection control, dental practitioners should thus encourage their patients to continue receiving periodontal treatment and other forms of specialized care.

"Though it may seem obvious that the mouth is not separate from the body and that oral bacteria can have negative effects on other organs, delaying dental treatment underestimates the interconnectedness between the mouth and body," he noted. Molayem added that conducting a serum test could quickly and easily measure a patient's IL-6 levels to make sure that they are

within normal limits.

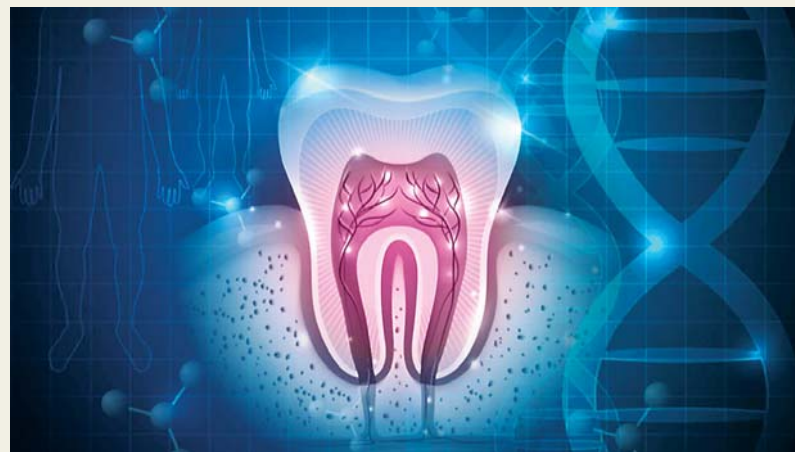
The review, titled "The mouth-COVID connection: IL-6 levels in periodontal disease-potential role in COVID-19-related respiratory complications," was published in the October 2020 issue of the *Journal of the California Dental Association*. - **Dental Tribune International**

New research may expedite regenerative dentistry

STOCKHOLM, SWEDEN - Understanding of cell types and the mechanisms of dental growth is essential for the reconstruction and engineering of teeth. Therefore, researchers from Karolinska Institutet in Stockholm have investigated the cellular composition of growing and non-growing mouse and human teeth. They believe that the new data on the cellular make-up and growth of teeth could accelerate developments in regenerative dentistry and in the treatment of tooth sensitivity.

Even though major tooth cell types have long been identified, the spectrum of various tooth cells and stem cells, their differentiation, and the interactions that enable tooth growth remain poorly understood. Teeth develop through a complex process in which soft tissue, with connective tissue, nerves and blood vessels, is bonded with three different types of hard tissue into a functional body part.

In contrast to humans, whose teeth are completed before adulthood, mice and many other species have teeth which continue to grow throughout



Researchers have identified and characterised all dental stem and differentiated cell types in human teeth. (Image: Tefi/Shutterstock)

life. The incisor stem cell population in mice continuously self-renews and replenishes tissue that is lost owing to gnawing, making this model attractive for studies of stem cell generation, cell differentiation and injury-induced regeneration.

Mapping of dental cell populations

Using a single-cell RNA sequencing method and genetic tracing, the researchers examined the characteristics of growing mice incisors, compared them with non-

growing mice molars and evaluated the extent to which the mouse model reflects the growth of human teeth. In this manner, the researchers at Karolinska Institutet, in collaboration with the Medical University of Vienna in Austria and Harvard University in the US, identified and characterised all cell populations in mouse teeth, in young growing human teeth and in adult human teeth.

"From stem cells to the completely differentiated adult cells we were able

to decipher the differentiation pathways of odontoblasts, which give rise to dentine [...] and ameloblasts, which give rise to the enamel," said the study's senior author, Dr Igor Adameyko, senior researcher in the Department of Physiology and Pharmacology at Karolinska Institutet, and co-author Dr Kaj Fried, senior professor in the Department of Neuroscience at Karolinska Institute, in a press release. According to them, they also discovered new cell types and cell layers which may play a role in tooth sensitivity.

In addition, the findings might explain complex aspects of the immune system in teeth and help in understanding the formation of tooth enamel. "We hope and believe that our work can form the basis of new approaches to tomorrow's dentistry. Specifically, it can expedite the fast-expanding field of regenerative dentistry," added the authors.

The study, titled "Dental cell type atlas reveals stem and differentiated cell types in mouse and human teeth", was published online on 23 September 2020 in *Nature Communications*. - **Dental Tribune International**