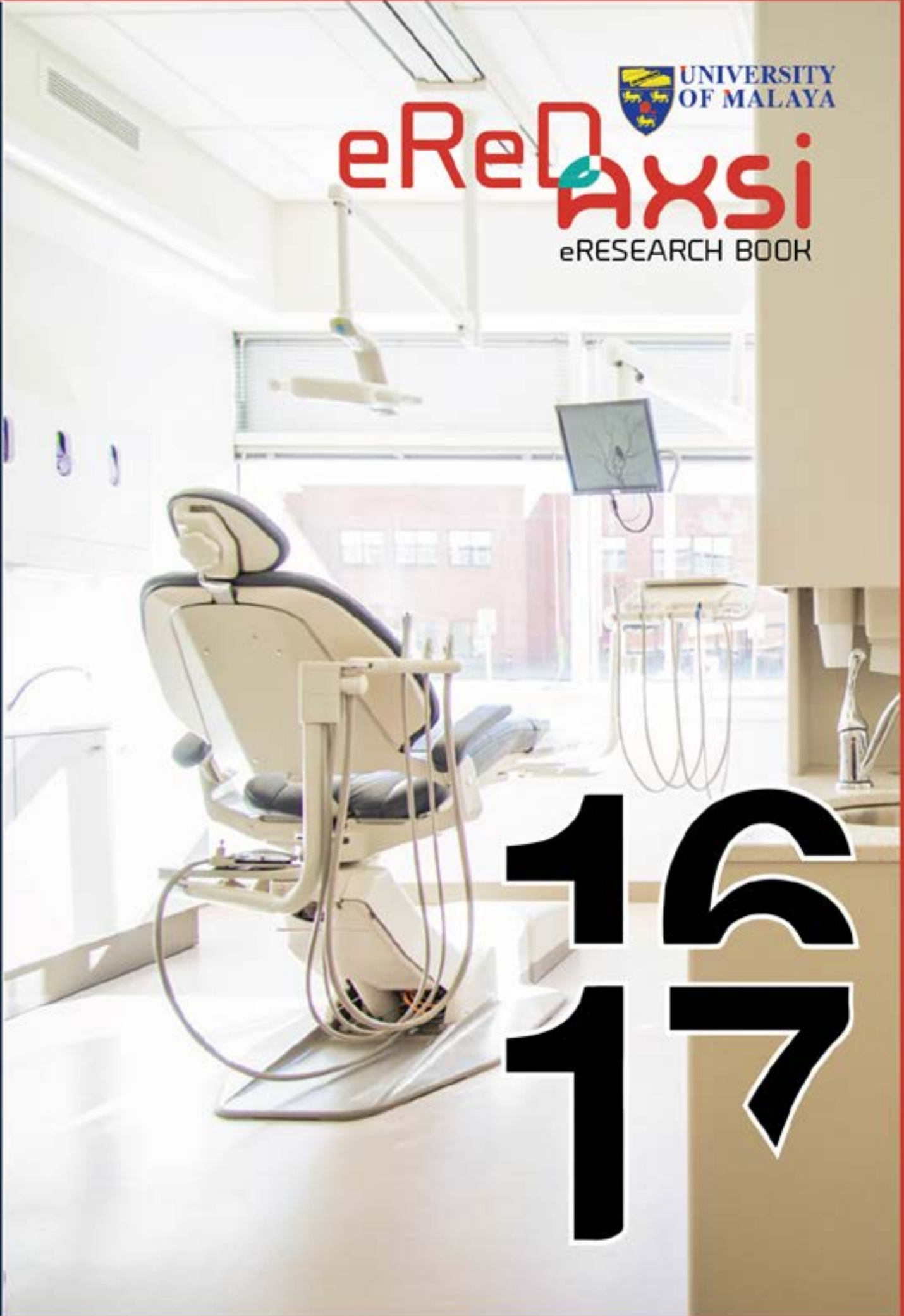




# eReD Axsi

eRESEARCH BOOK



16  
17

**ADDRESS**

571, HAMILTON SQUARE  
LAKE PAK ROAD  
SOUTHERN AUSTIN  
BERMUDA

**PRESS**

21, BERDOCK HOUSE  
LAKE PAK ROAD  
SOUTHERN AUSTIN  
BERMUDA

**PHONE** +770021 4587

**EMAIL** WEAREBE@COMPANY.COM

**WEB** WWW.COMPANY.COM

**SO  
KEEP US  
WITH  
YOU**



**WHEN  
CREATIVES  
ARE  
CORPORATE**

Your  
Image  
Here

Lorem ipsum dolor sit amet, consec-  
tetuer adipiscing elit, sed diam  
nonummy nibh euismod tincidunt ut  
laoreet dolore magnLorem ipsum  
dolor sit amet, consectetuer adipisc-  
ing elit, sed diam nonummy nibh  
euismod tincidunt, sed diam  
nonummy nibh euismod tincidunt ut  
laoreet dolore magn.

twitter@bedesigns

Your Image Here

Research in a Nutshell

Our Research in the World Map

[www.projectpage.com](http://www.projectpage.com)

Your Image Here

Your Image Here

### Highlights of Programs

Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio.

[www.projectpage.com](http://www.projectpage.com)

Your Image Here

### Centralised Research Facilities

Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio.

[www.projectpage.com](http://www.projectpage.com)

Your Image Here

### Research Output

Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio.

[www.projectpage.com](http://www.projectpage.com)

Your Image Here

### Acknowledgement

Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio.

[www.projectpage.com](http://www.projectpage.com)



	2016	2017
National Rank	1st	1st
International Rank	101-150	101-150



2016-2017

**RM 5.6M**  
WORTH OF RESEARCH FUNDING



2016-2017

**211**  
NO. OF ARTICLES INDEXED IN ISI/WOS DATABASE



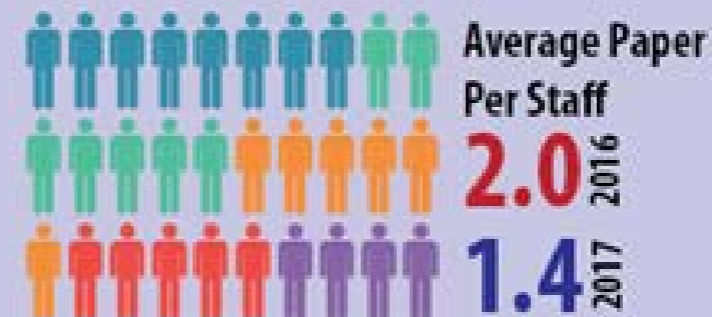
2016-2017

**2**  
PATENT APPLICATION SUBMITTED



2016-2017

**6403**  
NO. OF CITATION ACQUIRED



**51**  
Total of Award/Recognition Awarded to Faculty Personnel

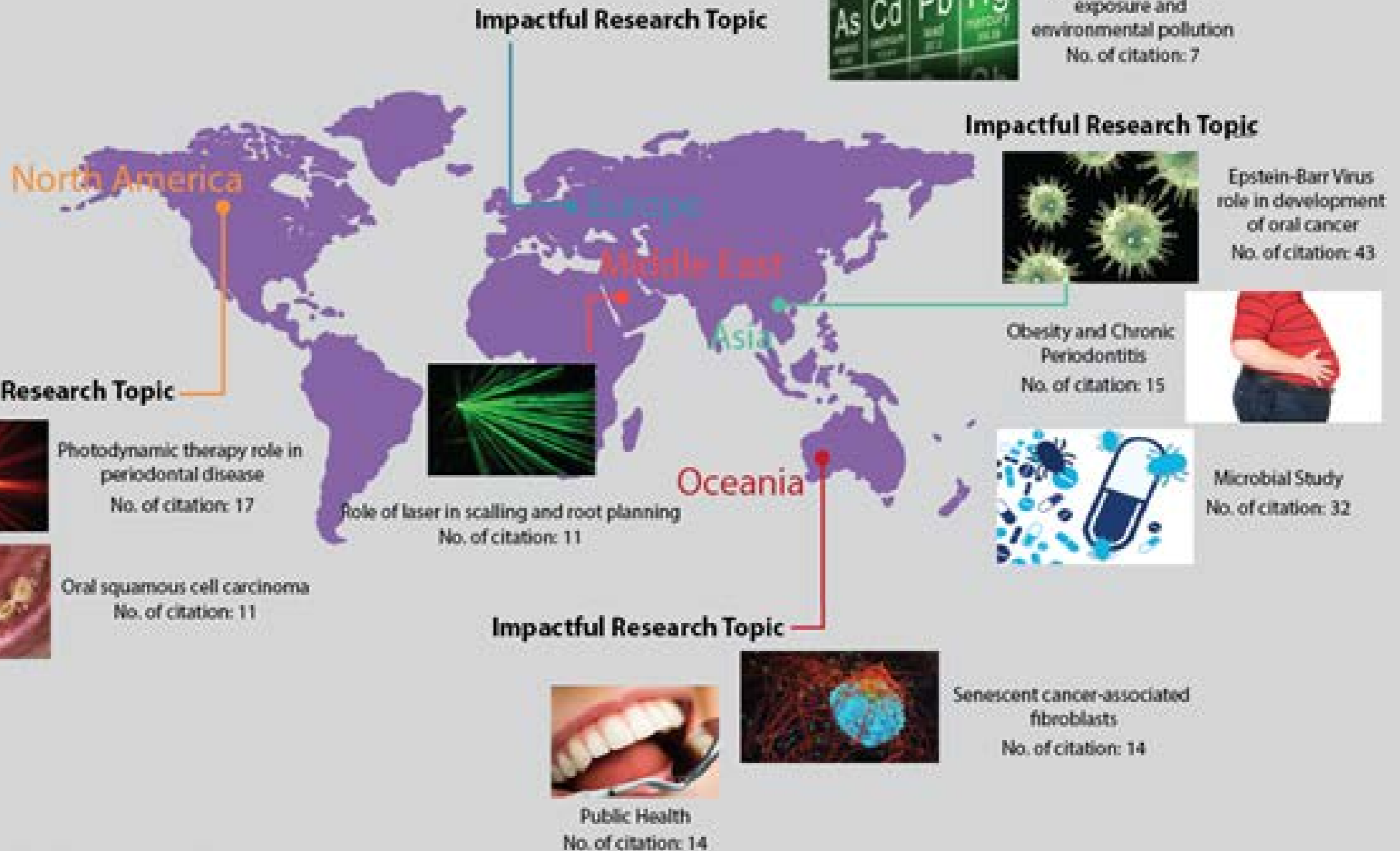
# Sharing expertise and groundbreaking research around the world



Sphingosine-1-Phosphate  
No. of citation: 8



Bioindicator of metal exposure and environmental pollution  
No. of citation: 7



\*Based on Scival and Web of Sciences data 15th May 2018

YOUR  
IMAGE HERE

# Highlights of Programs

lipsumONLINE

YOUR  
IMAGE HERE



Your Image  
Here

Team achievement : How they conveying

## #111 Dental Congregation 2016

#111 Dental Congregation 2016 is the annual postgraduate scientific conferences conducted by the Faculty of Dentistry University of Malaya on 13th August 2016 & 14th August 2016 at The Royale Chulan Damansara, Petaling Jaya, Malaysia. Theme for conference was 111th Year of Excellent: Integrating Research and Practice.

This year's conference is organized with the aimed to make the conference a future major forum for research theory and clinical development related to oral health science and innovation in the area of oral health and dentistry. This exciting and stimulating scientific conference encompassed a combination of keynote lectures, symposia, oral and poster sessions to enhance and ensure the participants are kept up to date with the current research and scientific development in oral health field.



### Guest of Honor

The opening ceremony was officiated by Y.Bhg. Tan Sri Dato Seri Utama Arsyad Ayub, UM Chairman





### *Invited Speakers*

**Professor Paul Brunton**

Dean Faculty of Dentistry,  
University of Otago New Zealand

**Professor Warwick Duncan**

Clinical Professor, Faculty of Dentistry,  
University of Otago New Zealand

**Professor Dr. Adrian Yap**

Head Department of Dentistry of JurongHealth,  
Singapore's Western Public Healthcare Cluster,  
Adjunct Professor, University of Malaya

**Dr. Jeremy J W Breckon,**

Consultant Orthodontist, Kings College London

**Professor Vishy Mahadevan**

Professor of Anatomy,  
Royal College of Surgeons of England

**Mr. David Barnett**

Consultant Orthodontist, Kings College London

**Professor St John Crean**

Robert Bradlaw Advisor and Executive Dean of the  
College of Clinical and Biomedical Sciences,  
University of Lancashire

## *Oral Presentation*

**Best presenter**

Postgraduate Student: Dr. Yap Wai Ying  
Institution: Department of Restorative Dentistry,  
Faculty of Dentistry, University of Malaya  
Supervisor/ Co-Supervisor/ Co-Researcher: Z.A.  
CHE ABDUL AZIZ, N.H. AZAMI  
Research Title: Comparison of Bond Strength of  
Different Sealers to Root Dentine

**1st Runner Up**

Postgraduate Student: Dr. Asfand Ali Khan  
Institution: Department of Restorative Dentistry,  
Faculty of Dentistry, University of Malaya  
Supervisor/ Co-Supervisor/ Co-Researcher: M. AB-  
DULLAH, N.S.M. NOOR  
Research Title: Defects in Two Rotary File Systems  
After Root Canal Preparation

**2nd Runner Up**

Postgraduate Student: Dr. Mustaffa Bin Jaapar  
Institution: Department of Community Oral Health  
and Clinical Prevention, Faculty of Dentistry, Uni-  
versity of Malaya  
Supervisor/ Co-Supervisor/ Co-Researcher: R.  
SAUB, G. MUSA  
Research Title: Dental Tourism in Malaysia: Dental  
Tourism in Malaysia: Tourists' Profile and Motiva-  
tion

## *Poster Presentation*

**Best presenter**

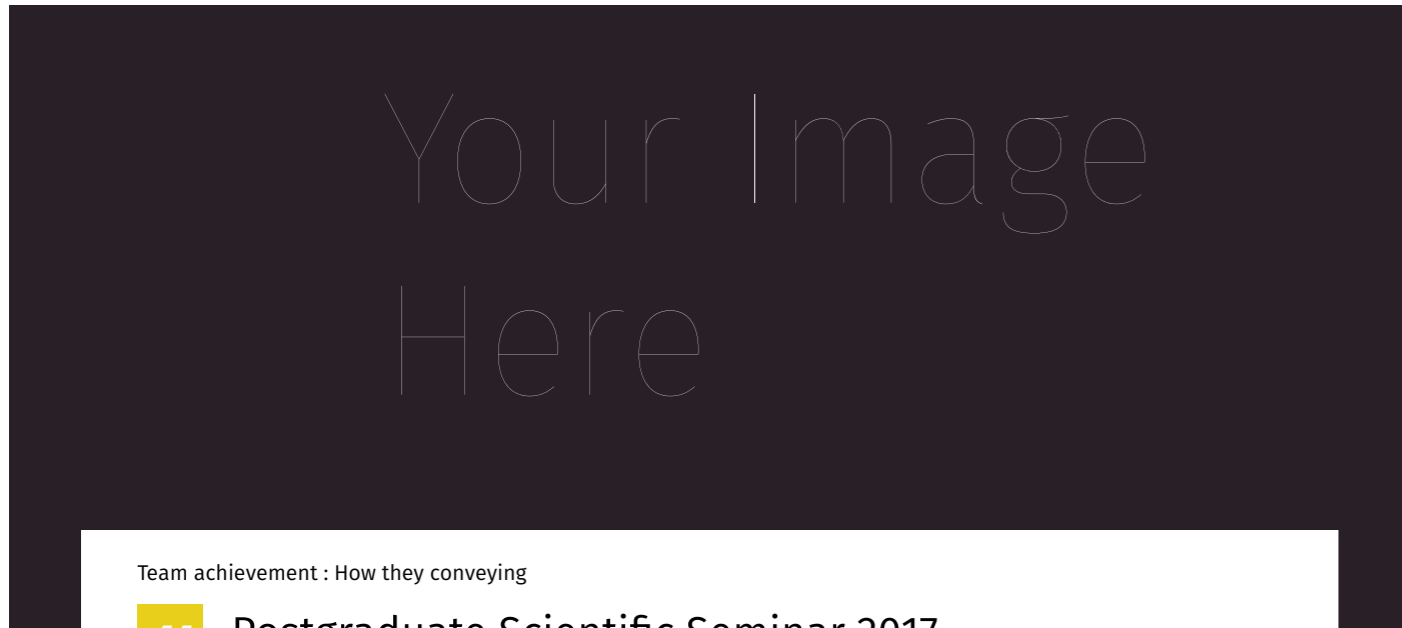
Postgraduate Student: Phang Wai Mei  
Institution: Department of Oral and Craniofacial  
Sciences, Faculty of Dentistry, University of Malaya  
Supervisor/ Co-Supervisor/ Co-Researcher: S.C.B.  
GOPINATH, Y. CHEN  
Research Title: Aptamer Substitutes Immunoassays

**1st Runner Up**

Postgraduate Student: Dr. Tameem Khuder Jassim  
Institution: Department of Restorative Dentistry,  
Faculty of Dentistry, University of Malaya  
Supervisor/ Co-Supervisor/ Co-Researcher:  
N.YUNUS, E. SULAIMAN  
Research Title: Occlusal Forces and Bone Resorp-  
tion in Mandibular Implant Supported Overden-  
tures

**2nd Runner Up**

Postgraduate Student: Dr. Azizah Murtuzah Shekh  
Institution: Department of Restorative Dentistry,  
Faculty of Dentistry, University of Malaya  
Supervisor/ Co-Supervisor/ Co-Researcher: N.A.  
YAHYA  
Research Title: Shear Bond Strength of Various  
Adhesives System to Dentine



Team achievement : How they conveying

**// Postgraduate Scientific Seminar 2017**

Postgraduate Scientific Seminar 2017 is the annual postgraduate scientific conferences conducted by the Faculty of Dentistry University of Malaya on 10th August 2017 at Balai Ungku Aziz, Faculty of Dentistry, University of Malaya. Theme for conference was "Inspire, Collaborate and Translate".



The opening ceremony was officiated by Prof. Dr. Kamila Ghazali, Vice Chancellor UM

### Speakers

**Prof. Martyn Cobourne**  
 Professor & Academic Head of Orthodontics at King's College London & Honorary Consultant in Orthodontics at Guy's & St Thomas's NHS Foundation trust.

**Dr. Yaw Siew Lian**  
 Timbalan Pengarah Kanan Jusa C, Kementerian Kesihatan Malaysia



### Winner

**Best presenter**  
 Postgraduate Student: Dr. Nurul Hayati Bt Anwar  
 Department: Department of Community Oral Health and Clinical Prevention, Faculty of Dentistry, University of Malaya  
 Supervisor: Assoc. Prof. Dr. Zamros Yuzadi Mohd Yusof  
 Research Title: Oral Health Literacy of Caregivers and Pre-school Children's Oral Health-Related Quality of Life



### 1st Runner Up

Postgraduate Student:  
 Dr. Norhidayah @ Nor Zahidah Binti Mohd Tahir  
 Institution: Department of Paediatric Dentistry and Orthodontics, Faculty of Dentistry, University of Malaya  
 Supervisor: Dr. Wan Nurazreena Wan Hassan  
 Research Title: Comparing Thermoplastic Retainers Constructed on Conventional and 3D Reconstructed Model

### 2nd Runner Up

Postgraduate Student: Dr. Nor Nadia Zakaria  
 Institution: Department of Paediatric Dentistry and Orthodontics, Faculty of Dentistry, University of Malaya  
 Supervisor: Assoc. Prof. Dr. Zamri Radzi  
 Research Title: The Effect of Fluoride on Corrosion Characteristics of Orthodontic Archwires



# Your Image Here

Team achievement : How they conveying

## Life Quality Symposium on Oral Health

The symposium brings together experts from the University of Malaya and the National University of Singapore to discuss issues relating to the assessment of oral health care outcomes. Quality of life has become an important aspect to measure the effect of oral health care as well as promoting clinical guidance. The use of these two indicators will provide a comprehensive overview of health care results. The program's website has also been created for the recent updates of the program at <http://umnus2017.weebly.com/>



**1st day:**  
3rd November 2017 (Friday)  
: 8.00am – 1.00pm  
Dewan Bankuasi  
Fakulti Alam Bina, UM



**2nd day:**  
4th November 2017 (Saturday),  
8.00am – 5.00pm  
Balai Ungku Aziz,  
Fakulti Pergigian UM

### Speakers

**Prof. Dr. Adrian Yap**

- Living with TMD: Quality of Life Issues by Prof. Dr. Adrian Yap

**Prof. Dr. Patrick Finbarr Allen**

- Quality of Life Measurement in Dentistry
- Why and How & Interpreting QoL Data from Clinical Trials
- Does Treatment Make a Difference

### Theme

Measuring outcome beyond clinical indicators

First day:  
November 3, 2017 (Friday) 8.00 am - 1.00 noon  
Faculty of Buildings Faculty Hall, UM

The second day:  
November 4, 2017 (Saturday), 8.00am - 5.00pm  
Balai Ungku Aziz, Faculty of Pergigian UM



OCRCC

Highlights of Programs

# beCentralised 2018

## TCRL

## RDL

### #LoremIPSUM

Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio. it in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio.

[www.projectpage.com](http://www.projectpage.com)

### #LoremIPSUM

Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio.

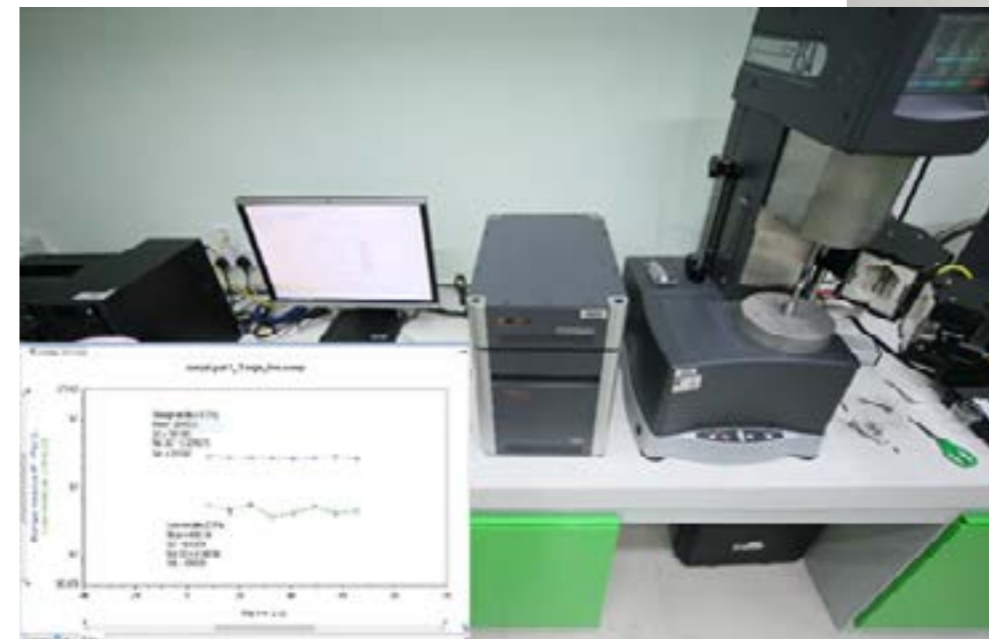
[www.projectpage.com](http://www.projectpage.com)

## Thermal Characterization Research Laboratory (TCRL)

Thermal Characterization Research lab offers research services and facilities focus on thermal analysis on research materials where the properties of materials are studied as they change with temperature. High-end equipment that available for the analysis is DSC, TGA, and DMA.

### FEATURED EQUIPMENT Dynamic Mechanical Analyzer (RSA-G2 Solid Analyzer)

The TA Instruments RSA-G2 Dynamic Mechanical Analyzer (DMA) is the most advanced platform for mechanical analysis of solids. The DMA tests the dynamic mechanical properties of solid materials by using a servo drive linear actuator to mechanically impose an oscillatory deformation, or strain, upon the material being tested. Temperature and environment control for the RSA-G2 is provided by the new Forced Convection Oven, FCO. The FCO is an air/N<sub>2</sub> gas convection oven designed for optimum temperature stability, extremely rapid heating and cooling, and ease of use over the temperature range of -150 to 600 °C. The maximum controlled heating rate is 60 °C/min. The sample given will be processed by experienced lab staff with affordable charges from RM50 to RM80 per sample.



### CONTACT INFORMATION:

Office number: 03-79676499

Email: [rnc\\_dental@um.edu.my](mailto:rnc_dental@um.edu.my)

### ADDRESS:

Thermal Characterization Research Laboratory  
Ground Floor, Blok D,  
Faculty of Dentistry, University of Malaya,  
50603, Kuala Lumpur

Link: <https://drmc.um.edu.my/tcrl/>

## Research & Diagnostics Laboratory (RDL)

4 | Adverts



The Research & Diagnostics Laboratory (RDL) offers research services including formalin-fixed and frozen tissues sectioning, tissue staining and cytology for early diagnosis of Oral Cancer applying the Thin Prep Auto Smear method. To facilitate research analyses, the lab is equipped with Fluorescent and Brightfield Microscopies, Digital tissue scanning, and Laser Capture Microdissection. Since 2012, the lab has received various samples from research institutions in public and private sectors.



**FEATURED EQUIPMENT**  
Digital Slide Scanner  
(High Demand)

The Panoramic scanner microscope creates digital slides that can be saved on a local computer connected to the scanner. By having the ScanToServer application installed, users are able to upload the digital slides through the scanner software directly to the CaseCenter server where slides can be evaluated and shared. This facility also allows you to create a Teleconsultation session to discuss specific cases with pathologists. The sample given will be processed by experienced lab staff and an affordable service charge (RM 5-30/slide) will be imposed to the customer.



**CONTACT INFORMATION:**

Office number: 03-79676499  
Lab number: 03- 7967 6462  
Email: rmc\_dental@um.edu.my

**ADDRESS:**

Research & Diagnostics Laboratory (RDL),  
Level 6, Dental Specialist and Research Tower,  
Faculty of Dentistry, University of Malaya,  
50603, Kuala Lumpur  
Link: <https://drmc.um.edu.my/research-laboratory/rdl/>

# However It Looks Awesome Publication!

*Quis nostrud e xerci tation u llamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis a utem vel e um iriure d olor i n hendrerit i n vulputate velit esse m olestie c oneleifend option congue n ihil i mperdiet d oming i d quod m azim plastic..*

your Magazine  
image here  
like this style

*Quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie c oneleifend o ption congue n ihil i mperdiet doming id quod mazim plastic..*



## Dynamic analysis of bulk-fill composites: Effect of food-simulating liquids

Ahmed Hesham Eweisa, Adrian U-Jin Yapa,b, Noor Azlin Yahyaa,

J Mech Behav Biomed Mater. 2017 Oct;74: 183-188.  
doi: 10.1016/j.jmbbm.2017.06.004.  
Epub 2017 Jun 6. PubMed PMID: 28605721.

This study investigated the effect of food simulating liquids on visco-elastic properties of bulk-fill restoratives using dynamic mechanical analysis. One conventional composite (Filtek Z350 [FZ]), two bulk-fill composites (Filtek Bulk-fill [FB] and Tetric N Ceram [TN]) and a bulk-fill giomer (Beautiful-Bulk Restorative [BB]) were evaluated. Specimens (12 × 2 × 2 mm) were fabricated using customized stainless steel molds. The specimens were light-cured, removed from their molds, finished, measured and randomly divided into six groups. The groups (n = 10) were conditioned in the following mediums for 7 days at 37 °C: air (control), artificial saliva (SAGF), distilled water, 0.02 N citric acid, heptane, 50% ethanol-water solution. Specimens were assessed using dynamic mechanical testing in flexural three-point bending mode and their respective mediums at 37 °C and a frequency range of 0.1–10 Hz. The distance between the supports were fixed at 10 mm and an axial load of 5 N was employed. Data for elastic modulus, viscous modulus and loss tangent were subjected to ANOVA/Tukey's tests at significance level p<0.05. Significant differences in visco-elastic properties were observed between materials and mediums. Apart from bulk-fill giomer, elastic modulus was the highest after conditioning in heptane. No apparent trends were noted for viscous modulus. Generally, loss tangent was the highest after conditioning in ethanol. The effect of food-simulating liquids on the visco-elastic properties of bulk-fill composites was material and medium dependent.

[Dynamic analysis of bulk-fill composites: Effect of food-simulating liquids](#)



## Characteristics and Young's Modulus of Collagen Fibrils from Expanded Skin Using Anisotropic Controlled Rate Self-Inflating Tissue Expander

Manssor NA, Radzi Z, Yahya NA, Mohamad Yusof L, Hariri F, Khairuddin NH, Abu Kasim NH, Czernuszka JT.

Skin Pharmacol Physiol. 2016;29(2):55-62. doi: 10.1159/000431328.  
Epub 2016 Feb 3. PubMed PMID: 26836267.

Mechanical properties of expanded skin tissue are different from normal skin, which is dependent mainly on the structural and functional integrity of dermal collagen fibrils. In the present study, mechanical properties and surface topography of both expanded and non-expanded skin collagen fibrils were evaluated. Anisotropic controlled rate self-inflating tissue expanders were placed beneath the skin of sheep's forelimbs. The tissue expanders gradually increased in height and reached equilibrium in 2 weeks. They were left in situ for another 2 weeks before explantation. Expanded and normal skin samples were surgically harvested from the sheep (n = 5). Young's modulus and surface topography of collagen fibrils were measured using an atomic force microscope. A surface topographic scan showed organized hierarchical structural levels: collagen molecules, fibrils and fibers. No significant difference was detected for the D-banding pattern: 63.5 ± 2.6 nm (normal skin) and 63.7 ± 2.7 nm (expanded skin). Fibrils from expanded tissues consisted of loosely packed collagen fibrils and the width of the fibrils was significantly narrower compared to those from normal skin: 153.9 ± 25.3 and 106.7 ± 28.5 nm, respectively. Young's modulus of the collagen fibrils in the expanded and normal skin was not statistically significant: 46.5 ± 19.4 and 35.2 ± 27.0 MPa, respectively. In conclusion, the anisotropic controlled rate self-inflating tissue expander produced a loosely packed collagen network and the fibrils exhibited similar Dbanding characteristics as the control group in a sheep model. However, the fibrils from the expanded skin were significantly narrower. The stiffness of the fibrils from the expanded skin was higher but it was not statistically different.

[Characteristics and Young's Modulus of Collagen Fibrils from Expanded Skin Using Anisotropic Controlled Rate Self-Inflating Tissue Expander](#)



## Dental tourism: Examining tourist profiles, motivation and satisfaction

Mustaffa Jaapar, Ghazali Musa, Sedigheh Moghavvemi, Roslan Saub,

Tourism Management, Volume 61, 2017, Pages 538-552, ISSN 0261-5177,  
<https://doi.org/10.1016/j.tourman.2017.02.023>.

Despite the overwhelming interest in medical tourism research, knowledge in dental tourism, which is its subspecialty, remains limited. This study is the first to measure tourist profiles, travel motivation and satisfaction among inbound dental tourists in Malaysia. We purposely sampled twelve selected private dental clinics in Kuala Lumpur, Selangor, Melaka and Penang; and distributed the questionnaires to their inbound dental tourists. A total of 196 inbound tourists responded to the questionnaire, mainly from Southeast Asia, Australia, New Zealand and Europe. In order of importance, the main motivation factors were dental care quality, dental care information access, and cost-savings. Tourists were extremely satisfied with dental care services received in the country. While dental care quality, dental care information access and supporting services positively influenced tourist satisfaction; cost-savings and cultural similarities had negative influences. Based on the research findings, we propose some managerial and marketing recommendations.

[Dental tourism: Examining tourist profiles, motivation and satisfaction](#)



## Personality Traits and Stress Levels among Senior Dental Students: Evidence from Malaysia and Singapore

Yusof ZYM, Hassan WNW, Razak IA, Hashim SMN, Tahir MKAM, Keng SB.

Southeast Asian J Trop Med Public Health. 2016 Nov;47(6):1353-65.  
PubMed PMID: 29641164.

This study aimed to evaluate the association between dental students' personality traits and stress levels in relation to dental education programs among senior dental students in University Malaya (UM) in Malaysia and National University of Singapore (NUS). A cross-sectional survey using a self-administered questionnaire was conducted on UM and NUS senior dental students. The questionnaire comprised items on demographic background, the Big Five Inventory Personality Traits (BFIPT) test and a modified Dental Environment Stress (DES) scale. Rasch analysis was used to convert raw data to interval scores. Analyses were done by t-test, Pearson correlation, and Hierarchical regression statistics. The response rate was 100% (UM=132, NUS=76). Personality trait Agreeableness (mean=0.30) was significantly more prevalent among UM than NUS students (mean=0.15, p=0.016). In NUS, Neuroticism (mean=0.36) was significantly more prevalent than in UM (mean=0.14, p=0.002). The DES mean score was higher among NUS (mean=0.23) than UM students (mean=0.07). In UM, Neuroticism was significantly correlated with stress levels (r=0.338, p<0.001). In NUS, these were Neuroticism (r=0.278, p=0.015), Agreeableness (r=0.250, p=0.029) and Conscientiousness (r=-0.242, p=0.035) personality traits. The correlation was strongest for personality trait Neuroticism in both schools. Hierarchical regression analysis showed that gender and Neuroticism were significant predictors for students' stress levels (p<0.05) with the latter exerting a bigger effect size (R<sup>2</sup>=0.18) than gender (R<sup>2</sup>=0.04). This study showed that gender and Neuroticism personality trait were significant predictors for stress levels among selected groups of dental students in Southeast Asia. Information on students' personality may be useful in new students' intake, stress management counseling and future program reviews.

[Personality Traits and Stress Levels among Senior Dental Students: Evidence From Malaysia And Singapore](#)



## Alternative Sweeteners Influence the Bio-mass of Oral Biofilm

Abdul Razak F, Baharuddin BA, Akbar EFM, Norizan AH, Ibrahim NF, Musa MY.

Arch Oral Biol.2017 Aug;80:180-184. doi: 10.1016/j.archoral-bio.2017.04.014. Epub 2017 Apr 20. PubMed PMID: 28448807.

**Objective:** Compact-structured oral biofilm accumulates acids that upon prolonged exposure to tooth surface, causes demineralisation of enamel. This study aimed to assess the effect of alternative sweeteners Equal Stevia®, Tropicana Slim®, Pal Sweet® and xylitol on the matrix-forming activity of plaque biofilm at both the early and established stages of formation. **Methods:** Saliva-coated glass beads (sGB) were used as substratum for the adhesion of a mixed-bacterial suspension of *Streptococcus mutans*, *Streptococcus sanguinis* and *Streptococcus mitis*. Biofilms formed on sGB at 3h and 24 h represented the early and established-plaque models. The biofilms were exposed to three doses of the sweeteners (10%), introduced at three intervals to simulate the exposure of dental plaque to sugar during three consecutive food intakes. The treated sGB were (i) examined under the SEM and (ii) collected for turbidity reading. The absorbance indicated the amount of plaque mass produced. Analysis was performed comparative to sucrose as control. **Results:** Higher rate of bacterial adherence was determined during the early compared to established phases of formation. Comparative to the sweeteners, sucrose showed a 40% increase in bacterial adherence and produced 70% more plaque-mass. Bacterial counts and SEM micrographs exhibited absence of matrix in all the sweetener-treated biofilms at the early phase of formation. At the established phase, presence of matrix was detected but at significantly lower degree compared to sucrose ( $p < 0.05$ ). **Conclusion:** Alternatives sweeteners promoted the formation of oral biofilm with lighter mass and lower bacterial adherence. Hence, suggesting alternative sweeteners as potential antiplaque agents. ([Abstract](#))

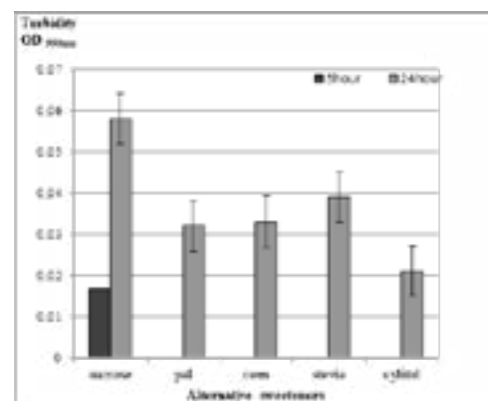
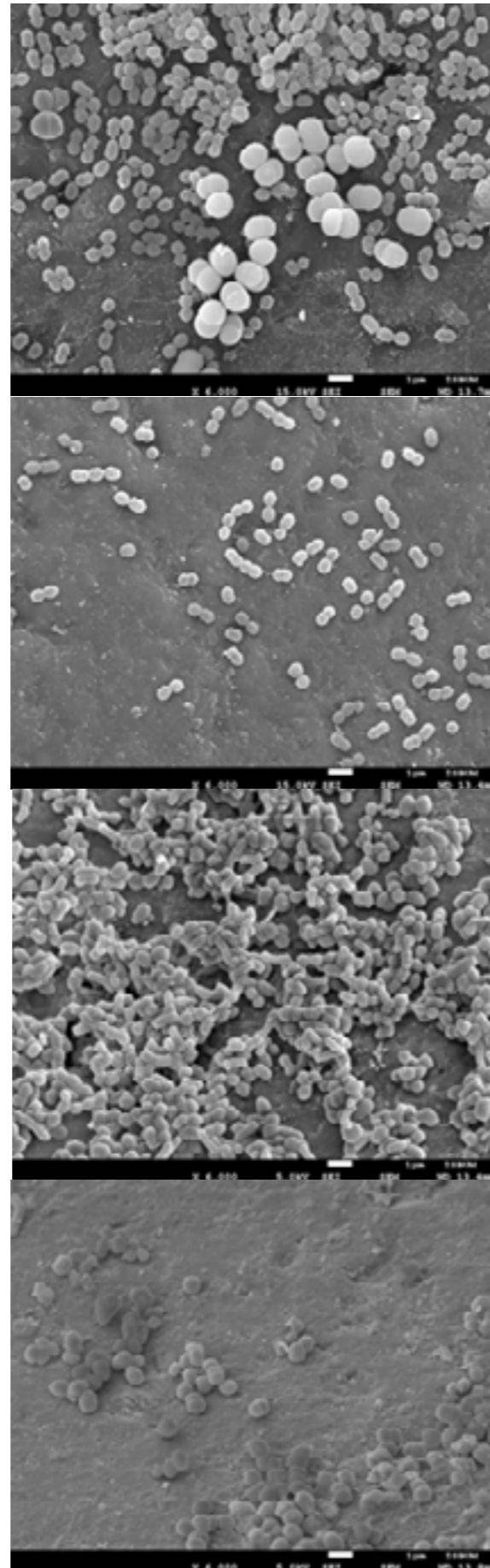


Fig. 1: Levels of plaque mass produced in 3hr-plaque and 24hr-plaque models following three doses of Pal Sweet®, Tropicana Slim® and Equal Stevia® in comparison xylitol and sucrose as the positive and negative controls, respectively. Data produced were the mean of three trials performed in triplicates (n=9).



## Distinct Biological Potential of Streptococcus gordonii and Streptococcus sanguinis Revealed by Comparative Genome Analysis

Wenning Zheng<sup>2</sup>, Mui Fern Tan<sup>2</sup>, Lesley A. Old<sup>4</sup>, Ian C. Paterson<sup>2,3</sup>, Nicholas S. Jakubovics<sup>4,5</sup> & Siew Woh Choo<sup>1,2</sup>

*Streptococcus gordonii* and *Streptococcus sanguinis* are pioneer colonizers of dental plaque and important agents of bacterial infective endocarditis (IE). To gain a greater understanding of these two closely related species, we performed comparative analyses on 14 new *S. gordonii* and 5 *S. sanguinis* strains using various bioinformatics approaches. We revealed *S. gordonii* and *S. sanguinis* harbor open pan-genomes and share generally high sequence homology and number of core genes including virulence genes. However, we observed subtle differences in genomic islands and prophages between the species. Comparative pathogenomics analysis identified *S. sanguinis* strains have genes encoding IgA proteases, mitogenic factor deoxyribonucleases, nickel/cobalt uptake and cobalamin biosynthesis. On the contrary, genomic islands of *S. gordonii* strains contain additional copies of comCDE quorum-sensing system components involved in genetic competence. Two distinct polysaccharide locus architectures were identified, one of which was exclusively present in *S. gordonii* strains. The first evidence of genes encoding the CylA and CylB system by the  $\alpha$ -haemolytic *S. gordonii* is presented. This study provides new insights into the genetic distinctions between *S. gordonii* and *S. sanguinis*, which yields understanding of tooth surfaces colonization and contributions to dental plaque formation, as well as their potential roles in the pathogenesis of IE.

[Distinct Biological Potential of Streptococcus gordonii and Streptococcus sanguinis Revealed by Comparative Genome Analysis](#)



## Crouzon Syndrome: A Case Series of Cranio-maxillofacial Distraction Osteogenesis for Functional Rehabilitation

Hariri F, Abdul Rahman ZA, Bahuri NFA, Azmi MN, Abdullah NA, Ganesan D.

J Oral Maxillofac Surg. 2018 Mar;76(3):646.e1-646.e12. doi: 10.1016/j.joms.2017.11.029. Epub 2017 Nov 26. PubMed PMID: 29268076.

Crouzon syndrome (CS) is the most common cranio-synostosis syndrome and requires a comprehensive management strategy for the optimization of care and functional rehabilitation. This report presents a case series of 6 pediatric patients diagnosed with CS who were treated with distraction osteogenesis (DO) to treat serious functional issues involving severe orbital proptosis, an obstructed nasopharyngeal airway, and increased intracranial pressure (ICP). Three boys and 3 girls were 8 months to 6 years old at the time of the operation. The mean skeletal advancement was 16.1 mm (range, 10 to 27 mm) with a mean follow-up of 31.7 months (range, 13 to 48 months). Reasonable and successful outcomes were achieved in most patients as evidenced by adequate eye protection, absence of signs and symptoms of increased ICP, and tracheostomy tube decannulation except in 1 patient. Complications were difficult fixation of external stabilizing pins in the distraction device (n = 1) and related to surgery (n = 4). Although DO can be considered very technical and can have potentially serious complications, the technique produces favorable functional and clinical outcomes in treating severe CS.

[Crouzon Syndrome: A Case Series of Craniomaxillofacial Distraction Osteogenesis for Functional Rehabilitation](#)



Variables measured from computed tomograms of each patient. A, Anatomic points of the computed tomographic midsagittal view.

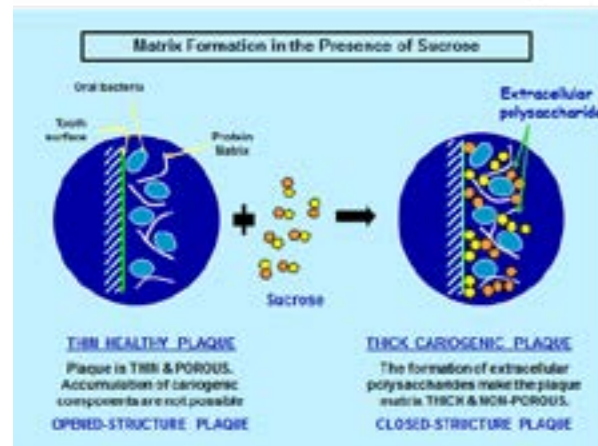


## Monobloc Le Fort Iii Distraction Osteogenesis for Correction of Severe Fronto-Orbital and Midface Hypoplasia in Pediatric Crouzon Syndrome

Hariri F, Cheung LK, Rahman ZA, Mathaneswaran V, Ganesan D

Cleft Palate Craniofac J. 2016 Jan;53(1):118-25. doi: 10.1597/14-210. Epub 2015 Feb 4. PubMed PMID: 25650655.

In severe syndromic craniosynostosis, distraction osteogenesis (DO) provides superior segmental advancement and allows progressive clinical monitoring to ensure that adequate skeletal expansion is achieved. We report two cases of Crouzon syndrome involving a 3-year-old boy and a 4-year-old girl, who were both treated with monobloc Le Fort III DO using a combination of external and internal distraction devices (Synthes, Oberdorf, Switzerland) to treat severe orbital proptosis and obstructed nasopharyngeal airway secondary to severe hypoplastic craniofacial skeletal components. Their skeletal segments were advanced in daily increments by 27 mm and 23 mm, respectively. Results at 18 months postoperatively showed successful outcomes, as evidenced by adequate eye protection, tracheostomy tube decannulation following objective evidence of patent nasopharyngeal airway, and acceptable facial appearance. Monobloc Le Fort III DO using a combination of external and internal devices produces favorable functional and clinical outcomes for the treatment of severe orbital and airway discrepancy in Crouzon syndrome.



Good oral hygiene leads to beautiful smile.  
Alternative sweeteners commonly consumed in Malaysia.



## Effect of Dental Pulp Stem Cells In MPTP-Induced Old-Aged Mice Model

Gnanasegaran N, Govindasamy V, Simon C, Gan QF, Vincent-Chong VK, Mani V, Krishnan Selvarajan K, Subramaniam V, Musa S, Abu Kasim NH.

Eur J Clin Invest. 2017 Jun;47(6):403-414. doi: 10.1111/eci.12753. Epub 2017 Apr 27. PubMed PMID: 28369799.

**Background** Parkinson's disease (PD) is a neurodegenerative disease caused by the loss of dopaminergic (DAergic) neurons in the substantia nigra (SN) and represented as a huge threat to the geriatric population. Cell replacement therapies (CRTs) have been proposed as a promising strategy to slow down or replace neuronal loss. Among the widely available cell sources, dental pulp stem cells (DPSCs) portray as an attractive source primarily due to their neural crest origin, ease of tissue procurement and less ethical hurdles. **Materials and methods** We first demonstrated the in vitro differentiation ability of DPSCs towards DA-ergic cells before evaluating their neuro-protection/neuro-restoration capacities in MPTP-induced mice. Transplantation via intrathecal was performed with behavioural assessments being evaluated every fortnight. Subsequent analysis investigating their immunomodulatory behaviour was conducted using neuronal and microglial cell lines. **Results** It was apparent that the behavioural parameters began to improve corresponding to tyrosine hydroxylase (TH), dopamine transporter (DAT) and dopamine decarboxylase (AADC) immunostaining in SN and striatum as early as 8-week post-transplantation ( $P < 0.05$ ). About 60% restoration of DA-ergic neurons was observed at SN in MPTP-treated mice after 12-week post-transplantation. Similarly, their ability to reduce toxic effects of MPTP (DNA damages, reactive oxygen species and nitric oxide release) and regulate cytokine levels was distinctly noted ( $P < 0.05$ ) upon exposure in in vitro model. **Conclusions** Our results suggest that DPSCs may provide a therapeutic benefit in the old-aged PD mice model and may be explored in stem cell-based CRTs especially in geriatric population as an attempt towards 'personalized medicine'.

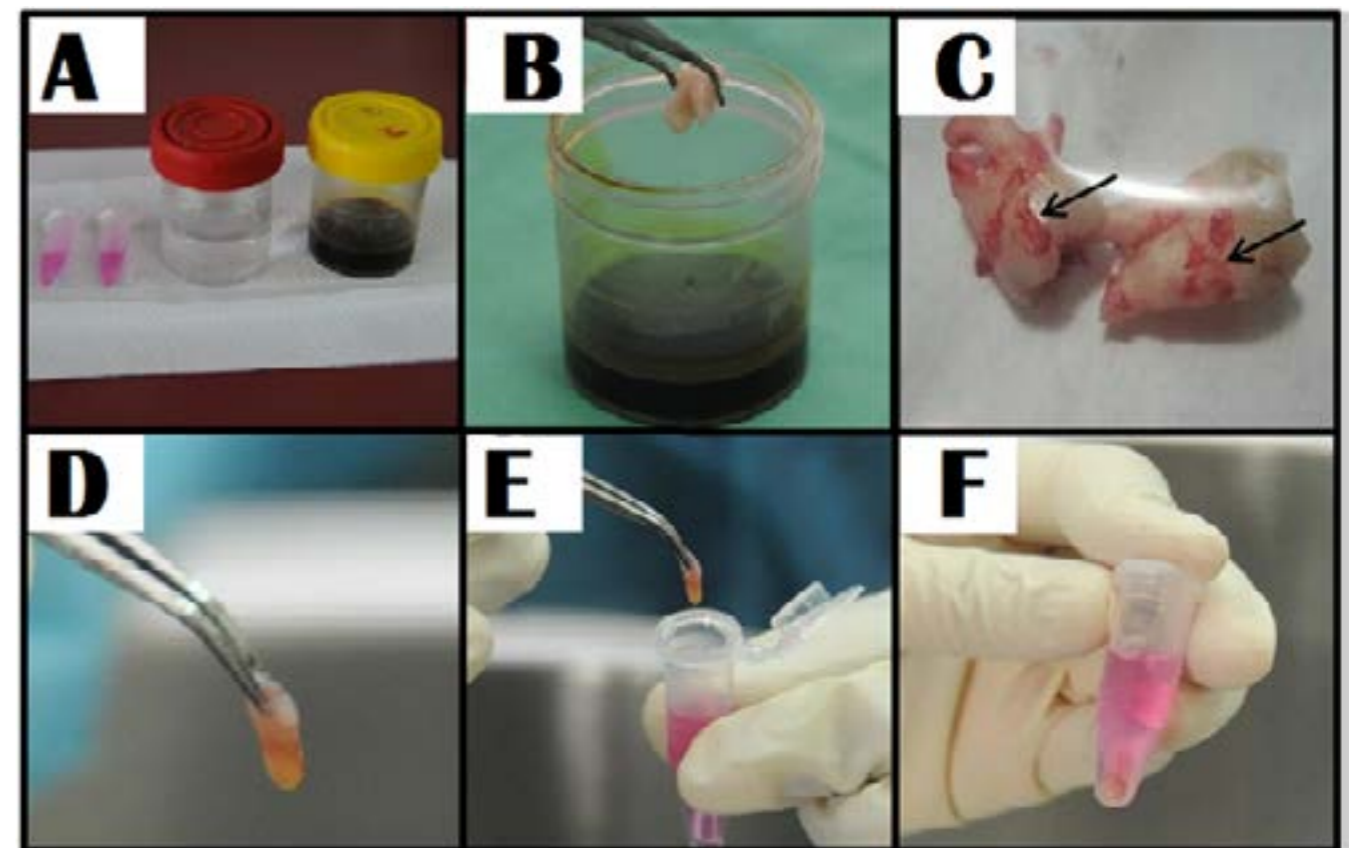


## Generation of functional hepatocyte-like cells from human deciduous periodontal ligament stem cells

Vasanthan P, Jayaraman P, Kunasekaran W, Lawrence A, Gnanasegaran N, Govindasamy V, Musa S, Kasim NH. Generation of functional hepatocyte-like cells from human deciduous periodontal ligament stem cells.

Naturwissenschaften. 2016 Aug;103(7-8):62. doi: 10.1007/s00114-016-1387-7. Epub 2016 Jul 5. PubMed PMID: 27379400.

Human deciduous periodontal ligament stem cells have been introduced for as an easily accessible source of stem cells from dental origin. Although recent studies have revealed the ability of these stem cells in multipotential attribute, their efficiency of hepatic lineage differentiation has not been addressed so far. The aim of this study is to investigate hepatic lineage fate competence of periodontal ligament stem cells through direct media induction. Differentiation of periodontal ligament stem cells into hepatocyte-like cells was conducted by the exposure of two phase media induction. First phase was performed in the presence of hepatocyte growth factors to induce a definitive endoderm formation. In the subsequent phase, the cells were treated with oncostatin M and dexamethosone followed by insulin and transferrin to generate hepatocyte-like cells. Hepatic-related characters of the generated hepatocyte-like cells were determined at both mRNA and protein level followed by functional assays.



Isolation of periodontal ligament. A) From left to right; transportation medium, washing buffer and Povidone-iodine (PVP-I) solution. B) Cleaning of tooth surface with PVP-I solution. C) Periodontal ligament tissues (PDL). D) Scrapped PDL tissue with tweezers. E) PDL tissue transferred to transportation medium. F) Immersed PDL tissue in transportation medium.

magazine **be**