



# RESEARCH @ MAHSA

VOLUME 2 · ISSUE 2 · 2020



## TRAINING DENTAL PROFESSIONALS

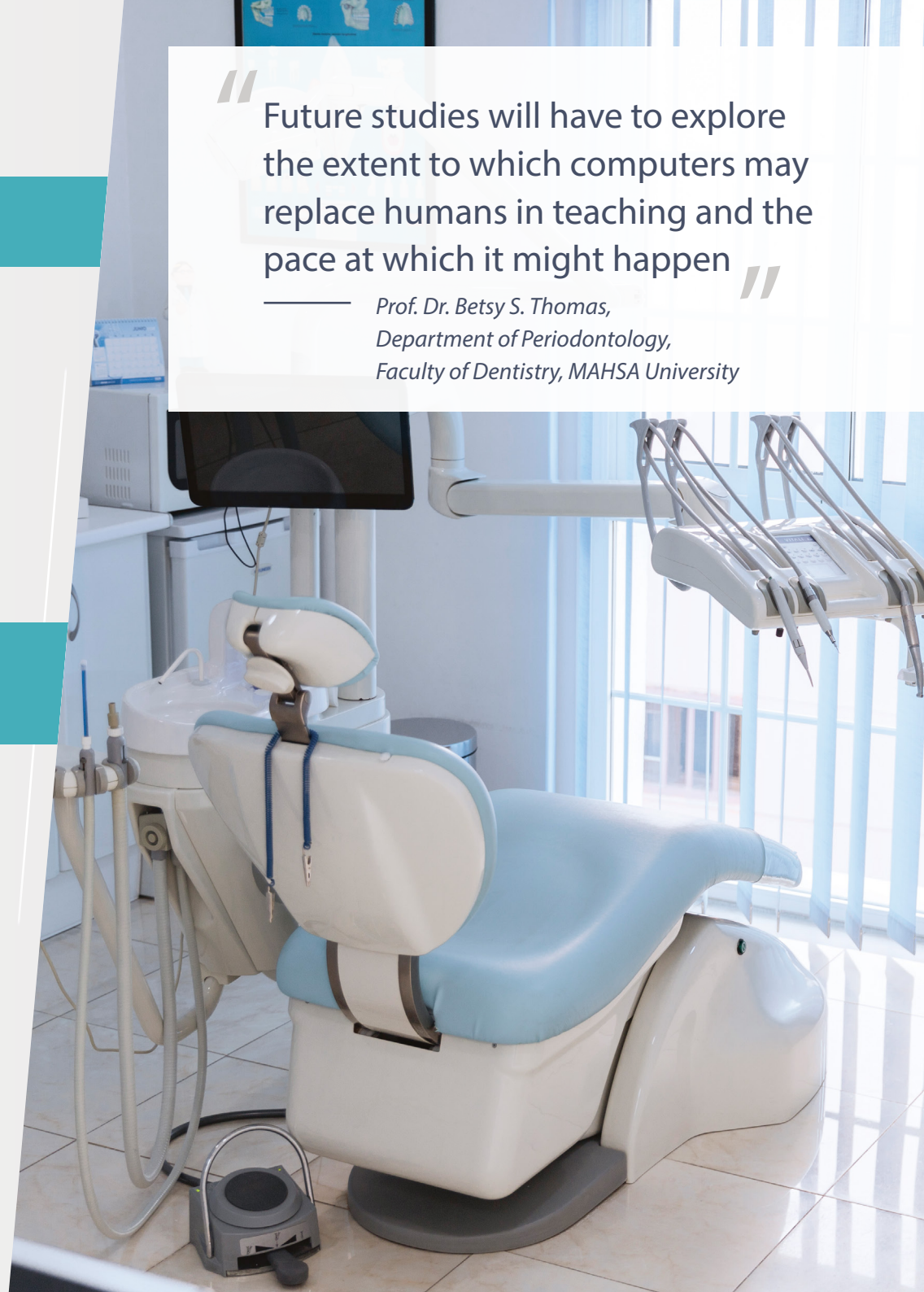
The perception among the general population about dentistry seems to be that it is more psychomotor or skills - based than cognitive or knowledge - based. Yes, dental treatment involves a lot of artistic and hand skills, but knowledge plays an equally, if not more, important role in diagnosing and delivering the necessary treatment. At the same time, the ubiquitous use of computers in daily life has been making an immense impact on higher education as well.

## CAN COMPUTERS REPLACE HUMAN IN DENTAL EDUCATION?

In the Faculty of Dentistry, MAHSA clinicians and researchers are working together to investigate on whether computers can replace humans in dental education. Their article titled "Computer - Assisted Learning vs. Small - Group Tutorials in Periodontal Charting : A Randomized Controlled Trial in a Malaysian Dental School " is now published in the Journal of Orofacial Sciences. Dr. Betsy S. Thomas, Professor in the Department of Periodontology, led the research together with Professor Dr. Mohan Alexander, from the Department of Oral and Maxillofacial Surgery and two other researchers, Mdm Nur Sulwana Mohamad Hanapi ( Bio-statistician ) and Dr. Yeannie Yap Hui Yeng ( Department of Oral Biology and Biomedical Sciences ) produced the report.

“ Future studies will have to explore the extent to which computers may replace humans in teaching and the pace at which it might happen ”

— Prof. Dr. Betsy S. Thomas,  
Department of Periodontology,  
Faculty of Dentistry, MAHSA University



“ Replacing the lecturer with Computer teaching to any significant extent is not likely to happen in the near future ”

Prof. Dr. Betsy S. Thomas,  
Department of Periodontology,  
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The article highlights that in the current coronavirus pandemic situation when there has been a total shift to online education, the pre - eminence of computers in education is being trumpeted as the definitive solution but the study shows that it's the human factor that is more important. This was amplified by the feedback from the participants who were unanimous in their opinion that though computer - assisted learning was fascinating, it was the human touch that provided authenticity to the teaching - learning process.



More Information on the article  
<http://www.jofs.in/text.asp?2019/11/2/100/276714>

Key Researchers : Prof. Dr. Betsy S. Thomas, Prof. Dr. Mohan Alexander, Madam Nur Salwana, Mohamad Hanapi, Dr. Yeannie Yap Hui Yeng  
Edited by : Dr. Muhamad Fareez Ismail, Mr. Wong GR - Faculty of Research Publicity ( FRP ) team

## Original Article

### Computer-Assisted Learning vs. Small Group Tutorials in Periodontal Charting: A Randomized Controlled Trial in a Malaysian Dental School

#### Abstract

**Introduction:** Dental education, like most fields of healthcare education, embraces all three domains of learning – cognitive, psychomotor and affective. The aim of this study was to determine whether computer-assisted learning (CAL) can replace face-to-face teaching with reference to acquiring theoretical as well as practical skills in periodontal charting in dentistry. **Material and Methods:** A total of 70 year 4 dental students were randomly assigned to CAL and Small Group Tutorial (SGT) groups. Following the sessions, they underwent theoretical knowledge as well as practical skills evaluation tests. Pre- and post-tests Confidence Log Questionnaires (CLQ) were completed by the students. **Results:** CAL and SGT were equally effective from the theoretical knowledge aspect. SGT group did better in some aspects of practical skills acquisition. **Conclusion:** There was no statistical difference in the theoretical knowledge acquired by the different methods, whereas small group teaching was more effective in gaining certain psychomotor skills in periodontal charting, leading us to conclude that face-to-face teaching seems to be having an upper hand when it comes to teaching periodontal charting.

**Keywords:** Computer-assisted learning, small group tutorials, periodontal charting, randomized controlled trial

#### Introduction

Dental education, like most fields of healthcare education, embraces all three domains of learning – viz. cognitive, psychomotor as well as affective. In the earlier days, there seems to have been more emphasis on the psychomotor field but with advances in biological science, dentistry has been giving equal importance to the cognitive aspects of various dental procedures also. At the same time, compared to most other related healthcare fields, psychomotor skills continue to occupy a place of great importance in dental education, since dental students begin treating patients from year 3 onwards. In dental educational institutions, this translates to more face-to-face teaching of students by lecturers – for achieving optimal motor skills as well as for lectures, small group tutorials (SGT), etc. This has resulted in increased workload for the lecturers. At the same time, there has been much said about the disadvantages of lectures like, students are passive during lectures, their attention wanes quickly after 20 to 25 minutes, etc.

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There seems to be an abundance of studies acclaiming the role of computers in education in general and higher education in particular.<sup>1,2</sup> A perusal of literature suggests that these modern means of education, like computer assisted learning (CAL), can and should be taking up more and more of the workload of the lecturers.<sup>1,2</sup> This prompted us to conduct this study to evaluate the role of computers in dental education in a developing country like Malaysia.

The aim of this study was to determine whether CAL can replace face-to-face teaching like SGT, with reference to acquiring theoretical as well as practical skills in periodontal charting, in dentistry. We hypothesized that the CAL group will fare better than the traditional SGT group.

#### Materials and Methods

We decided to follow the method used by V Bissell, R A McKelvie, D F Kinane, and S McHugh,<sup>3</sup> with a few variations, for this

Received: 17-9-2019 Revised: 18-11-2019  
Accepted: 4-12-2019 Published: 29-1-2020

**How to cite this article:** Thomas BS, Alexander M, NurSalwana MH, Yap HY. Computer-Assisted Learning vs. Small Group Tutorials in Periodontal Charting: A Randomized Controlled Trial in a Malaysian Dental School. J Orofac Sci 2019;11:100-4.

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# INNOVATIVE TREATMENT FOR ABNORMAL CONDITION

Dens evaginatus is one of the developmental defects associated with teeth which manifests as a structural defect of the crown of the tooth. The prevalence of this condition ranges from 0.06% to 7.7%. Due to this defect the teeth are more susceptible to caries and subsequent pulpal disease. Several treatment modalities have been identified to treat this condition based on the type of defect and range from using resin sealants. Among the contemporary materials being used during the course of endodontic treatment, bioceramic based sealers are at the forefront because of their unique antibacterial, bioactive, and regenerative properties. Thus the published case exemplifies the ability of bioceramic sealers to promote healing of periapical lesions over a period of time as seen from the follow - up radiographs.

Associate professor Dr. Kranthi R. Kacharaju and Prof. Dr. Kiran P. Singbal are instrumental in the selection and successful management of this case. This study reinforces the significant role of bioceramic sealers as endodontic obturating materials and encourages their use in diverse applications in endodontics. Their case report titled " Endodontic Management of Dens Evaginatus Using Bioceramic Material " is now published in the **World Journal of Dentistry**.

“ The ultimate form of validation of a technique is in successfully promoting healing of bodily tissues ”

— Prof. Dr. Kiran P. Singbal, Department of Conservative,  
Faculty of Dentistry, MAHSA University



More Information on the article

<https://www.wjoud.com/doi/pdf/10.5005/jp-journals-10015-1682>

## CASE REPORT

### Endodontic Management of Dens Evaginatus Using Bioceramic Material

Kranthi R Kacharaju<sup>1</sup>, Nazmul Haque<sup>2</sup>, Padmini Hari<sup>3</sup>, Kiran P Singbal<sup>4</sup>

#### ABSTRACT

**Aim:** This case report aims to describe nonsurgical endodontic treatment in a second mandibular premolar (tooth #45) with type II dens evaginatus using a new bioceramic material (OrthoMTA).

**Background:** A 13-year-old boy reported recurrent swelling related to mandibular premolars (#44 and #45) with discharging sinus in the periapical area.

**Case description:** Orthograde obturation with OrthoMTA was done after thorough disinfection using activated sodium hypochlorite (NaOCl) and calcium hydroxide (Ca(OH)<sub>2</sub>) medicament.

**Conclusion:** A 1-year post-obturation follow-up, using clinical and radiographic examination [cone-beam computed tomography (CBCT)] showed good apical sealing.

**Clinical significance:** The synergistic effect of the chemomechanical preparation and intracanal medicament, followed by the filling of OrthoMTA helped, in the successful management of this case.

**Keywords:** Bioceramics, Cone-beam computed tomography, Dens evaginatus, Mandibular premolar, OrthoMTA.

*World Journal of Dentistry* (2019); 10.5005/jp-journals-10015-1682

#### BACKGROUND

Dens evaginatus is a rare odontogenic developmental anomaly that results in the abnormal morphological presentation of the dental tissues. It is also known as a tuberculated cusp, accessory tubercle, tuberculum dentis, occlusal tuberculated premolar, crown tubercle, tuberculum coronae, leong's premolar, evaginatus odontoma, and occlusal pearl.<sup>1,2</sup> Prevalence of this pathological condition varies between races and ethnic groups, with a higher prevalence in the people from mongoloid origin while it is rare among the Caucasians.<sup>3,4</sup> This indicates the involvement of genetic factors in the pathogenesis of this disease.<sup>5</sup> Moreover, the prevalence of this is more in males compared to females.<sup>2</sup> Usually, the posterior teeth, often the premolars are affected by dens evaginatus, followed by the molars.<sup>6</sup>

The etiology of dens evaginatus is not clear yet. Several researchers have identified it as an anomaly during the developmental stage of the tooth that could occur because of

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**How to cite this article:** Kacharaju KR, Haque N, Hari P, et al. Endodontic Management of Dens Evaginatus Using Bioceramic Material. *World J Dent* 2019;10(6):461–465.

**Source of support:** Nil

**Conflict of interest:** None

Key Researchers : AP Dr. Kranthi R. Kacharaju, Dr. Nazmul Haque, Dr. Padmini Hari, Prof. Dr. Kiran P. Singbal

Edited by : Dr. Shanti Malleedi, Dr. Nazmul Haque – *Faculty Research Publicity (FRP) team*

## DESIGNING A NEW THERAPEUTIC AGENT TO REPAIR DAMAGED TISSUE

Exosome, a natural fluid - filled sac secreted by cells such as Mesenchymal stem cells (MSCs) have shown potential to heal damaged wound in tissue. However, safer methodology for exosome stimulation and bulk production method remains a technical challenge to meet the needs for current medical use.

Dr. Liew Fong Fong, a senior lecturer from Faculty of Dentistry, MAHSA University is leading an inter - university research team to design a novel spherical vesicle with lipid membrane known as liposome and use it to induce MSCs - derived exosome production.

This on - going project is studying the healing effect of liposomal induced - exosomes in fibroblast and keratinocyte cell system and the team is looking to understand healing pathways of this liposomal induced - exosome as well, said Dr. Liew.

Being one of the Fundamental Research Grant Scheme ( FRGS ) recipients in 2019, Dr. Liew Fong Fong is also a good clinical practice ( GCP ) - certified research scientist with 15 years of laboratory experience in the fields of biomedical, chemistry and green technology. She had previously worked as a Post - Doctoral researcher under University Malaya Cancer Research Institute ( UMCRI ) and Graduate School of Energy, Kyoto University. She has been actively involved in the teaching for physiology and cross - teaching of chemistry subject at the Faculty of Pharmacy. Her goal in education is to encourage creativity and higher - order of thinking in a way that increases student performance, as well as acquiring knowledge about students and applying it on lecture design and teaching.



Dr. Liew Fong Fong is looking for suitable Ph.D candidates who are interested to work on the same project.

Key Researchers : Dr. Liew Fong Fong, MAHSA University, Assoc. Prof. Dr. Ivy Chung, Universiti Malaya (UM), Dr. Tan Hsiao Wei, Universiti Malaya (UM)  
Edited by : Mr. Wong Gou Rean, Dr. Muhamad Fareez Ismail –  
Faculty Research Publicity (FRP) team





# MANDIBULAR THIRD MOLAR IMPACTION INCIDENCES IN MALAYSIA

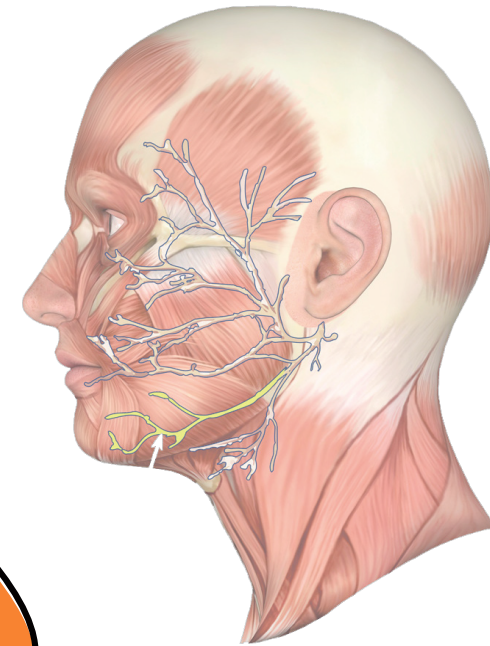
Early diagnosis of the mandibular third molar impaction is a crucial part of the comprehensive dental treatment planning. In orthodontic terms, an impacted tooth is simply a tooth that completely or partially unerupted into the dental arch resulted in extreme discomfort and other unpleasant symptoms. Tooth impaction on mandibular third molars is the most frequently encountered in routine dental practice. The prevalence varies with different population and regions. Little information is known regarding the pattern of the mandibular third molar impaction in Malaysian Population.

A group of former DDS final year student now serves as a dentist, Dr. Sharon Paul, Dr. Nurul Fatihah Che Ghani, under supervision of Dr. Mohammed Subhi Shareif, from Department of Oral and Maxillofacial Surgery, Faculty of Dentistry initiated a study to evaluate the association between race, age, gender with the incidence of the mandibular third molar impaction among Malaysian population. A hundred twenty - nine consecutively treated patients in local dental clinics participated in the study. Interestingly, the Indian race is found to have the highest incidence (2x) of mandibular third molar impaction in the Malaysian population, followed by Malay and Chinese without any bias in gender. The age group with the highest incidence of mandibular third molar impaction is between 28 - 33 years old while the commonest type of angulations seen in the impacted group is mesioangular.

The article is recently published in a Scopus - indexed journal, Journal of International Dental and Medical Research. Dr. Muhamad Fareez Ismail, from the Department of Oral Biology and Biomedical Sciences, had provided vital guidance and insight for the writing.

Although the retromolar space is not the only factor affecting the incidence of the mandibular third molar impaction, there is positive correlation between the retromolar space and chance for eruption

- Dr. Mohammed Subhi Shareif,  
Department of Oral and Maxillofacial Surgery,  
Faculty of Dentistry, MAHSA University



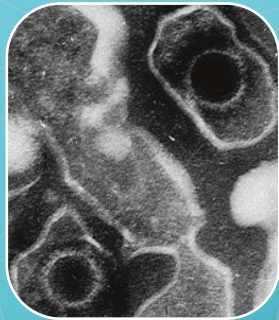
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Key Researchers : Dr. Mohammed Subhi Shareif, Dr. Sharon Paul, Dr. Nurul Fatihah Che Ghani  
Dr. Muhamad Fareez Bin Ismail  
Edited by : Dr. Fareez, Dr. Shanti Malleedi, Dr. Nazmul Haque –  
Faculty Research Publicity (FRP) team



# ESPTAIN BARR VIRUS AND ORAL CANCER



Tobacco and alcohol consumptions are well - established risk factors for oral cancer. Besides, there are some potential risk factors for OSCC. One such risk factor is Epstein Barr - virus ( EBV ). The association between other microbes ( human papillomavirus, Helicobacter pylori, and Candida ) and OSCC has been well - explored. However, studies assessing the EBV association in oral cancer very scarce. Furthermore, contradictory results are making the outcomes of these studies inconclusive. Our lecturer, Dr. Shivaranjhany A/P Sivakumar and her collaborating research partners from Malaysia, India and USA, had conducted a systematic review and meta - analysis on case - control studies to assess the association between EBV and OSCC. Their findings highlighted that the variations in the sensitivity and specificity of the diagnostic modalities and the varying diagnostic targets could be the causes behind the contradictory results reported in different case - control studies. From the meta - analysis findings, a strong association between EBV and OSCC is observed. However, considering the number and quality of the included studies as a major limitation, they propose further validation to reach to a conclusive association between the EBV and OSCC.





## Assessing the potential association between Epstein-Barr virus and oral squamous cell carcinoma: a systematic review and meta-analysis

Shivaranjhany Sivakumar<sup>1</sup>, Archana A. Gupta<sup>2</sup>, Nik Mohd Mazuan Nik Mohd Rosdy<sup>3</sup>, Annapurny Venkiteswaran<sup>4</sup>, A. Thirumal Raj<sup>5</sup>, Kamran Habib Awan<sup>6</sup>

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**Contributions:** (I) Conception and design: S Sivakumar, AA Gupta; (II) Administrative support: None; (III) Provision of study materials or patients: None; (IV) Collection and assembly of data: NM Nik Mohd Rosdy, A Venkiteswaran; (V) Data analysis and interpretation: AT Raj, KH Awan; (VI) Manuscript writing: All authors; (VII) Final approval of manuscript: All authors.

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The present article entitled "Assessing the potential association between Epstein - barr virus and oral squamous cell carcinoma : a systematic review and meta - analysis" is published in Translational Cancer Research journal.



[More Information on the article](http://dx.doi.org/10.21037/tcr.2020.01.09)

<http://dx.doi.org/10.21037/tcr.2020.01.09>

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Dr. Annapurny Venkiteswaran, Dr. A. Thirumal Raj, Dr. Kamran Habib Awan

**Edited by :** Dr. Nazmul Haque, Mr. Wong & Dr. Fareez – Faculty Research Publicity (FRP) team





## NANO CELLULOSE - A VERSATILE GREEN NANOMATERIAL

Nanocellulose, a term referring to cellulose nanomaterials, have received much research attention following demonstration of its strength, elasticity, biodegradability, and flexibility to be fabricated for a wide range of tailor-made applications including automotive, aerospace, construction and food processing. Nevertheless, the properties and specific applications of nanocellulose lie on the type or source of raw materials or cellulosic fibres. In tropical countries like Malaysia, cellulosic fibres are available in abundance as some of them are a waste product of the plant cultivation that are cheaply available in inexhaustible amount. Pineapple leaf fibre ( PALF ) is one of them. Interestingly, PALF exhibits excellent mechanical properties among other plant fibres.

Recent research publications led by Dr. Muhamad Fareez Ismail, a senior lecturer at the Department of Oral Biology and Biomedical Sciences, discusses its potential as a valuable source of nanocellulose. Despite PALF, his research team from Universiti Pertahanan Nasional Malaysia ( UPNM ) had previously isolated NC from other sources like rubber wood, rice straw and hard wood. Interestingly, they had developed few NC - based nanocomposites for bulletproof vest application.

Although research experiments demonstrated great potential, customized fabrication of NC for different industrial applications remains a challenging task, especially when it involves large - scale manufacturing.

“ There is still a long way ahead toward custom fabrication of NC - Based materials. Meanwhile, standardization and regulatory safety review are required for further commercialization purposes ”

— Dr. Muhamad Fareez Ismail,  
Senior lecturer,  
Department of Oral Biology and Biomedical Sciences,  
MAHSA University







Pineapple Leaf Fibers pp 147-163 | [Cite as](#)

## Physicochemical Properties of Nanocellulose Extracted from Pineapple Leaf Fibres and Its Composites

Authors Authors and affiliations

Ismail, Muhamad Fareez, Nazmul Haque, Der Jun Ooi, Ainil Hawa Jasni, Fauziah Abd Aziz

Chapter  
First Online: 14 February 2020

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### Abstract

Significant advancement on cellulose-based biomaterial research has also led to the development of nano-sized pineapple leaf cellulose fibres with wide application potentials. The present chapter presents the comprehensive review of cellulose fibre structure extracted from different pineapple varieties, covering some aspects related to the structure of this natural cellulose in terms of its morphology, chemical, physical and mechanical properties. This chapter also briefly introduces the fundamentals of nanocellulose and discussed the isolation and properties of pineapple leaf cellulose nanofibrils, nanofibrillated cellulose and cellulose nanocrystals in view to open further areas of composite study on the ideal selection of these nanomaterials for industrial use.

### Keywords

Cellulose Pineapple leaf fibre (PALF) Nanocellulose Crystallinity Mechanical properties

## Polymers and Polymer Composites

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### Fabrications of cellulose nanocomposite for tailor-made applications

Muhamad Fareez Ismail, Ainil Hawa Jasni, Der Jun Ooi

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<https://doi.org/10.1177/0967391120932055>

Article information

### Abstract

The unique properties of nanocelluloses (NCs), including nanodimension, renewability, low toxicity, biocompatibility, biodegradability, easy availability, and low cost, render them the ideal nanomaterials for diverse applications. Composite material consists of matrix material with low volume fraction and self-assembled NC fibers with a high volume fraction of reinforcing domain. These two-phase components are often combined to promote stiffness and improve toughness (by dissipating materials fracture energy). The challenge, however, is to control the alignment and distribution of NC within the matrix. Recent research has been focusing on the production of composites using different methodologies such as electrospun cellulose nanofibers, polymer-grafted NC, nanoparticle binding on NCs, assembly of NCs at the air/water and oil/water interfaces, protein-mediated interactions on NCs, and atomic layer deposition on NCs. In this case, NC serves as an appropriate candidate for composites preparation in comparison to the non-biodegradable nanofillers (e.g. carbon nanoclay and nanotube).

### Keywords

Nanocellulose, functionalization, fabrication, smart materials, application, composite, agro waste, materials science

## More information on the article



Fabrications of Cellulose Nanocomposite for Tailor-Made Applications", *Polymers and Polymer Composites*

<https://doi.org/10.1177/0967391120932055>



Physicochemical Properties of Nanocellulose Extracted from Pineapple Leaf Fibres and Its Composites: in M. Jawaid et al. (eds). *Pineapple Leaf Fibers, Green Energy and Technology*, Springer Nature Singapore Pte Ltd

[https://doi.org/10.1007/978-981-15-1416-6\\_9](https://doi.org/10.1007/978-981-15-1416-6_9)

Key Researchers : Dr. Muhamad Fareez Ismail, Ms. Ainil Hawa Jasni, Prof. Dr. Fauziah  
Co - Authors : Dr. Ooi Der Jun, Dr. Nazmul Haque  
Edited by : Dr. Fareez, Mr. Wong – *Faculty Research Publicity (FRP) team*