



DENT
CHULA

Annual Research Day

37th



19th Feb 2025



Message from the Dean

Dear Faculty, Students, and Staff,

Welcome to the 37th Annual Research Day of the Faculty of Dentistry, Chulalongkorn University. I am proud of the progress and excellence in research our faculty has achieved. In 2025, our aim is for the Faculty of Dentistry to be ranked among the top 40 in the world.

The purpose of our Research Day is to provide students with the opportunity to present valuable research projects and to expand their knowledge and experience through the exchange of information presented in this event.

This year, we are honored to have Professor Dr. Suchada Sukhong and Assistant Professor Dr. Paiboon Chitprasertthong join us. Both are distinguished experts who will share their knowledge, research expertise, and career paths with us today

I would like to extend my sincere appreciation to the research committee and the dedicated staff of the Office of Research and Innovation for their invaluable contributions. I wish all faculty members and students continued success and am confident that our collective research efforts will drive advancements in knowledge and innovation, fostering the sustainable development of dental education and practice.

Professor Pornchai Jansisyanont D.D.S., M.Sc., Ph.D.
Dean of Faculty of Dentistry, Chulalongkorn University

Organizing committee

1. Professor Thantrira Pornaveetus	Chairperson
2. Associate Professor Sirawut Hiran-us	Committee
3. Dr. Wisarut Prawatvatchara	Committee
4. Professor Rangsin Mahanonda	Committee
5. Associate Professor Chalida Limjeerajarus	Committee
6. Associate Professor Piyamas Sumrejkanchanakij	Committee
7. Associate Professor Palinee Detsomboonrat	Committee
8. Associate Professor Panida Thanyasrisung	Committee
9. Associate Professor Waleerat Sukarawan	Committee
10. Associate Professor Thanomsuk Jearanaiphaisarn	Committee
11. Assistant Professor Supreda Srithanyarat	Committee
12. Assistant Professor Soranun Chantarangsu	Committee
13. Assistant Professor Dusit Nantanapiboon	Committee
14. Assistant Professor Boosana Kaboosaya	Committee
15. Dr. Kanokwan Sriwattanapong	Committee
16. Mr. Kevin Allen Tompkins	Committee
17. Miss Lawan Boonprakong	Secretary
18. Mr. Ponchai Lo-orachun	Assistant to secretary
19. Miss Yanin Chamsai	Assistant to secretary
20. Miss Sureeporn Kaewhin	Assistant to secretary

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The 37th Research Day
Program Schedule on February 19th, 2025
Somdej Phra Yanasangvara Conference Room
19th floor, Boromanathsrinagarindra Building
Faculty of Dentistry, Chulalongkorn University

- 07.30 - 08.00 Registration
- 08.00 - 08.10 Opening Ceremony
- Professor Pornchai Jansisyanont**
Dean, Faculty of Dentistry, Chulalongkorn University
- 08.10 - 08.30 Faculty of Dentistry, Chulalongkorn University, Research Awards 2024
- 08.30 - 09.15 Special lecture "Think Beyond the Dental Chair: Building Your Path to Dental Innovation from an Entrepreneurial Perspective"
- Professor Suchada Sukrong**
Executive Director of Chulalongkorn School of Integrated Innovation, Chulalongkorn University
- Break
- 09.45 - 12.00 Undergraduate Research Competition (Oral presentation)
- 12.00 - 13.00 Lunch (Buffet) 10th floor, Boromanathsrinagarindra Building
- 13.00 - 13.40 Special lecture "Beyond the Lab: How Research Shapes Ideas and Inspires the Future"
- Assistant Professor Paiboon Jitprasertwong**
- 13.45 - 15.55 Poster Presentation for Student Research
- Break
- 15.55 - 16.10 Award Announcement for Student Research Competition
- Closing Remark

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Faculty of Dentistry, Chulalongkorn University

Oral Presentation

	Title	Page
OP-01	An <i>in vitro</i> color stability of CAD/CAM artificial denture teeth after exposing to colorant solutions and cleansing agent	25
OP-02	Hydroxyapatite nanoparticle effects on cell viability and migration of fibroblast and oral keratinocyte	26
OP-03	Efficacy of resin coating containing 2-methacryloyloxyethyl phosphorylcholine in reducing biofilm formation	27
OP-04	Factors that influence student proficiency in direct restorations during transition from preclinical to clinical practice	28
OP-05	Influence of sequential practicing for motor skill acquisition of non-dominant hand: A randomized controlled trial in undergraduate dental students	29
OP-06	Expression of Sirtuin 4 in oral squamous cell carcinoma and oral epithelial dysplasia	30
OP-07	I want to be a dental specialist! : what and how internal factors influence decision making on selecting a postgraduate dental programme?	31
OP-08	Association of oral bacteriome and mycobiome and the development of oral candidiasis following topical corticosteroid therapy in patients with oral lichen planus	32
OP-09	Accuracy of oral examination and teledentistry in diagnosing dental caries and gingivitis	33
OP-10	Transcriptome profile of human macrophages in co-cultured with human supracrestal gingival connective tissue-derived MSCs	34

Poster Presentation

	Title	Page
PP-01	Factors affecting the pain intensity of patients undergoing lower third molar surgical removal	36
PP-02	Investigation into patient satisfaction regarding implant-supported crowns and abutments using different materials, and the influence of different complications	37
PP-03	Low temperature irrigation and pain reduction after impacted lower third molar removal	38
PP-04	Density of iNOS-positive M1 and CD206-positive M2 macrophages in medication-related osteonecrosis of the jaw (MRONJ)	39
PP-05	Comparing local anesthetics efficacy between lidocaine and mepivacaine in healthy young adults: A Double-blind clinical pilot study	40
PP-06	Analyzing color, surface roughness, and microhardness on the unpolished and polished surfaces of occlusal splint materials from conventional and CAD-CAM fabrication methods	41
PP-07	Comparative evaluation of sodium ascorbate and ascorbic acid on the shear bond strength of resin composite attachments following enamel bleaching: <i>In vitro</i> study	42
PP-08	Accuracy assessment of 3D facial swelling measurement with novel technique using rigid reference	43
PP-09	Magnetic bioprinting of salivary gland mucoepidermoid cancer organoids for precision oncology	44
PP-10	The use of AI chatbots among students and staff of the Faculty of Dentistry, Chulalongkorn University	45
PP-11	Factors influencing the sufficient dental waste management practice among dental personnel in dental clinics across Bangkok	46
PP-12	Oral health survey of knowledge, attitude, belief, and behavior among undergraduate students of Chulalongkorn University	47
PP-13	Effectiveness of oral pathology mobile application in undergraduate preclinical dental education	48
PP-14	Red cabbage extract as a plaque pH indicator	49
PP-15	The impact of prosthodontic treatment on nutritional status, food diversity and depression in older adults: A cohort study	50
PP-16	Home repair fractured acrylic denture using nitrocellulose and cyanoacrylate adhesives in comparison to conventional method	51
PP-17	A retrospective study of mucous extravasation phenomenon in Thais (2014-2023)	52
PP-18	Stability and bactericidal activity of chemical disinfectants	53
PP-19	Evaluating the effectiveness of the oral health literacy learning program for health professionals in enhancing oral health knowledge among Thai patients	54
PP-20	The effect of brushing simulation on the mechanical properties of restorative materials	55

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Poster Presentation

	Title	Page
PP-21	Identifying essential life skills from the perspective of Dental students at Chulalongkorn University: A qualitative research	56
PP-22	Effect of similarity to root anatomy design in dental implant of mandibular first molar on stress distribution using finite element analysis	57
PP-23	Evaluating the effectiveness of the dentist voice-controlled assistant web application vs dental assistants in periodontal charting	58
PP-24	Comparative analysis of maximum bite force on conventional versus milling occlusal splints: A pilot study	59
PP-25	Surface characterization of different areas of cementum in human third molars	60
PP-26	Efficacy of disclosing tablets with water soluble food coloring agents on dental plaque staining	61
PP-27	Sex determination of mandibular ramus using lateral cephalogram: Thai populational study	62
PP-28	Applying highly transparent superhydrophobic coating on glass coverings of rear-surface dental mouth mirrors	63
PP-29	Factors influencing the occurrence of oral recurrent aphthous stomatitis in dental students in Faculty of Dentistry, Chulalongkorn University	64
PP-30	A comparison between London Atlas, Demirjian and Cameriere age estimation methods in Thai children and adolescents	65
PP-31	Fluoride release-recharge ability and lactic acid neutralizing ability of fluoride-absorbed mesoporous silica in surface coating agents for provisional prostheses	66
PP-32	Evaluating the accuracy of Large Language Models in the interpretation and analysis of periodontal chart	67
PP-33	Chatbot for improving oral hygiene during orthodontic treatment: A pilot study	68
PP-34	Development of GO/Ag-Cu NPs surface coating on NiTi alloy for biomedical applications	69
PP-35	An investigation into the usability testing of artificial intelligence-assisted assessment in evaluating the difficulty level of impacted mandibular third molar extractions	70
PP-36	An exploratory analysis of artificial intelligence-based evaluation systems for assessing the difficulty level of impacted lower third molar extractions	71
PP-37	Effect of eugenol-based material and surface treatment on microtensile bond strength of universal adhesive to deep dentin under simulated pulpal pressure	72

Poster Presentation Program Schedule

Time	Room 1 (Biology / Microbiology/ Material)	Room 2 (Clinical / Material)	Room 3 (AI / Education / Miscellaneous)
13.45	PP-04	PP-01	PP-10
13.55	PP-09	PP-03	PP-33
14.05	PP-17	PP-08	PP-23
14.15	PP-29	PP-05	PP-13
14.25	PP-18	PP-27	PP-32
14.35	PP-22	PP-30	PP-35
14.45	PP-25	PP-14	PP-36
14.55	PP-34	PP-26	PP-02
15.05	PP-06	PP-15	PP-11
15.15	PP-24	PP-28	PP-12
15.25	PP-07	PP-16	PP-19
15.35	PP-20	PP-31	PP-21
15.45	PP-37		

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Keynote Speakers

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Faculty of Dentistry, Chulalongkorn University

Professor Suchada Sukrong, Ph.D.
Executive Director
Chulalongkorn School of Integrated Innovation (CSII) Chulalongkorn University
Mobile : 081–8196742 E-mail : suchada.su@chula.ac.th

A proficient professor with facilitation skills to lead the R&D team, promoting innovative thinking and seamless collaboration with cross-functional teams to foster a cooperative environment for successful outcomes and a CEO of Herb Guardian Company with proven ability to seize opportunities for growth and establish lucrative relationships with key vendors and business partners. Additionally, an experienced Associate Dean with 8 years of strategic development for organizational missions and leadership cultivation.

Education

2004 Ph.D. (Plant Molecular Biology) University of Kentucky, U.S.A.
1994 M.Sc. (Pharmacognosy) Chulalongkorn University, Thailand
1990 B.Sc. (Pharmaceutical Sciences) Chulalongkorn University, Thailand

Employment

2018 - present Professor, Chulalongkorn University
2010 Associate Professor, Chulalongkorn University
2006 Assistant Professor, Chulalongkorn University
1997 Lecturer, Chulalongkorn University
1992 - 1996 Pharmacist, Police General Hospital
1990 - 1991 Pharmacist, Public Pharmaceutical Lab Co. Ltd.

Professional experience

Associate Dean for Student Affairs October 2013 – 2021

- Successful implementation of student success initiatives involves organizing for more than 2,000 pharmacy students to complete “The 7 Habits of Highly Effective People®” course
- Prepare and manage budgets consistent with strategic goals and university outcomes
- Support, encourage, and implement professional development opportunities for students, offering leadership skills. Design activities to be continuous throughout the academic journey, from Year 1 to Year 6, beginning with individual achievements and gradually advancing to collective success by the end of the program.
- Supporting diversity, in addition to separate bathrooms for women and men, gender-neutral bathrooms were provided to promote gender equality.
- Special initiatives, recognizing the importance of mental health in academic pursuits, The Student Affairs have assigned a psychologist for our own Pharmacy students. This ensures prompt problem-solving assistance for students, supporting their well-being and academic success.
- Organize a comprehensive student exchange program that provides opportunities for students to study and collaborate with foreign peers in both short and long-term durations. This includes fostering partnerships with

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international institutions to facilitate laboratory exchanges, allowing students to gain hands-on experience in diverse laboratory settings.

Second Vice President of Chulalongkorn University Faculty Senate

2021 - present

- Representing faculty members on the University's Executive and Risk Management Committee involves offering guidance to faculty members in identifying, assessing, and mitigating risks within their academic activities, research projects, and interactions with students and colleagues.

Committee for preparing Monographs of Selected Thai Materia Medica

2004 – present

- Writing monographs to be utilized as a reference for registration and quality control of herbal medicine formulations, ensuring consumers' confidence in the quality of Thai herbal medicines.

CEO, Herb Guardian Co., Ltd.

Spin-off Company Incubated by CU Innovation Hub November 2019 – Present

- Transformed entrepreneurial vision into reality by establishing a business dedicated to transdisciplinary research and development of new technologies for the commercialization of innovative products.
- Co-founder of Herb Guardian, a company that creates innovative health products from the integration of herbs and pharmaceutical technology as well as evaluating the effectiveness of products. Successfully generated over \$450,000 in revenue from IP licencing to Penta Innotec Co., Ltd. with the first groundbreaking product, PhytFoon® PM2.5 removal spray.
- The company achieved a 20% revenue growth within 2 years through its second product, CARA® special extract, by securing mutually beneficial contracts with key cosmetic industry partners
- Led a team of over 50 staff members, overseeing researchers, PostDoc fellows, and students, ensuring compliance with company regulations and timely, budget-conscious project completion. Addressed staff concerns across all levels, enhancing morale and performance
- Orchestrated the successful launch of a new DNA testing service catering to Advanced Therapy Medicinal Products (ATMPs), including biologics, cellular and gene therapy, and other innovative products
- Cultivating two CEO successors involves identifying high-potential candidates within the company. This process includes mentorship, leadership training, exposure to relevant business operations, and hands-on experience in decision-making and strategic planning. One successor will specialize in the bioactive raw materials business, while the other will focus on herbal standardization services.

Assistant Manager at Community Pharmacy Drug Store (Osotsala) 2004 - 2007

- Supervise students for their pharmacy professional practice training
- Oversee all aspects of the store's operations including managing inventory, ensuring compliance with regulations, and providing exceptional customer service



Research experience

2018 – present

Director of the Center of Excellence (CE) in DNA Barcoding of Thai Medicinal Plants, the nation's leader in the field of the DNA barcoding of plants. CE has generated a DNA barcode library of standardized DNA regions to aid species identification of more than 500 species of Thai medicinal plants. CE also provides academic services to private and government agencies for the bio-identification of confused plant species or commercial herbal products to avoid misidentification problems.

CE has collaboration with numerous countries, boasting a strong professional network such as The Chinese University of Hong Kong, The Hong Kong University of Science and Technology, University of Guelph, Technische Universität Dresden, and Seoul National University.

2017

Training for advance DNA barcode-based species identification at The Canadian Centre for DNA Barcoding, University of Guelph, Canada

2004 – present

An expert review academic articles from various sources, both domestic and international, including publications such as Scientific Reports, Heliyon, PlosOne, Frontiers in Pharmacology, Phytomedicine, Asian Medicine (Asian Med), Siriraj Journal, Thai Pharmacy Journal, Chiang Mai Journal of Science (CMJS), Songklanakarin Journal of Science and Technology (SJST)

Publications 75 publications, 792 citations, H – index 17

2024 Hasriadi, Wasana PW, Thongphichai W, Samun Y, Sukrong S, Towiwat P. 2024. Curcuma latifolia Roscoe extract reverses inflammatory pain in mice and offers a favorable CNS safety profile. J Ethnopharmacol 318, 116877.

2023 Urumarudappa SKJ, Rosario S, Ravikanth G, Sukrong S. 2023. A comprehensive review on Saraca asoca (Fabaceae)-Historical perspective, traditional uses, biological activities, and conservation. J Ethnopharmacol 317, 116861.

Khemthong P, Phanthasri J, Youngjan S, Wanmolee W, Samun Y, Sosa N, Rungnim C, Kraithong W, Sangkhun W, Parnthong J, Butburee T, Thanee K, Nakajima H, Supruangnet R, Towiwat P, Chanvorachote P, Sukrong S. 2023. Effect of the ethanol-to-water ratio on the properties of silica-carbon core-shell materials for prolonged antibacterial activity of thymol. Appl Surf Sci 635, 157716.

Thongphichai W, Pongkittiphon V, Laorpaksa A, Wiwatcharakornkul W, Sukrong S. 2023. Antimicrobial activity against foodborne pathogens and antioxidant activity of plant leaves traditionally used as food packaging. Foods 12(12), 2409.

Intharuksa A, Denduangboripant J, Chansakaow S, Thongkhao K, Sukrong S. 2023. HPLC and DNA barcoding profiles for identification of the selected twelve Mucuna species and its application for detecting prohibited aphrodisiac Mucuna products. Heliyon 9(3). e14130.

Hasriadi, Jongchanapong A, Thongphichai W, Wasana PW, Sukrong S, Suttisri R, Amnuoyopol S, Towiwat P. 2023. Antinociceptive efficacy of Clerodendrum petasites S. Moore, a Thai medicinal plant, and its CNS safety profiles. J Tradit Complement Med 13(1), 81-92.

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Liu Q, Komatsu K, Toume K, Zhu S, Tanaka K, Hayashi S, Anjiki N, Kawahara N, Takano A, Miyake K, Nakamura N, Sukrong S, Agil M, Balachandra I. 2023. Essential oil composition of *Curcuma* species and drugs from Asia analyzed by headspace solid-phase microextraction coupled with gas chromatography–mass spectrometry. *J Nat Med* 77, 152-72.

2022 Thongkhao K, Tungphatthong C, Sukrong S. 2022. A PCR-lateral flow immunochromatographic assay (PCR-LFA) for detecting *Aristolochia* species, the plants responsible for aristolochic acid nephropathy. *Sci Rep* 12(1),12188.

Tungphatthong C, Phadungcharoen T, Sooksawate T, Sukrong S. 2022. PCR combined with lateral flow immunochromatographic assay to differentiate the narcotic *Mitragyna speciosa* from related species and detect it in forensic evidence. *Forensic Sci Int* 331, 111149.

Kiratipaiboon C, Wasana PWD, Hasriadi, Sukrong S, Ruangrungsri N, Towiwat P. 2022. Herbal root extracts in Ben-Cha-Moon-Yai remedy attenuated pain-like behaviors and inflammation through the opioid and prostaglandin systems. *J Ethnopharmacol* 290, 115088.

Chimlee S, Roytrakul S, Sukrong S, Srisawat T, Graidist P, Kanokwiroon K. 2022. Anticancer effects and molecular action of 7- α -hydroxyfrullanolide in G2/M-phase arrest and apoptosis in triple negative breast cancer cells. *Molecules* 27, 407.

Liu Q, Zhu S, Hayashi S, Iida O, Takano A, Miyake K, Sukrong S, Agil M, Balachandran I, Nakamura N, Kawahara N, Komatsu K. 2022. Discrimination of *Curcuma* species from Asia using intron length polymorphism markers in genes encoding diketide-CoA synthase and curcumin synthase. *J Nat Med* 76, 69–86.

2021 Tungphatthong C, Urumarudappa SKJ, Awachai S, Sooksawate T, Sukrong S. 2021. Differentiation of *Mitragyna speciosa*, a narcotic plant, from allied *Mitragyna* species using DNA barcoding-high-resolution melting (Bar-HRM) analysis. *Sci Rep* 11, 6738.

Pisitpaibool S, Sukrong S, Kanjanapapakul K, Phisalaphong M. 2021. Effects of preharvest methyl jasmonate elicitation and electrical stimulation on camptothecin production by in vitro plants of *Ophiorrhiza ridleyana* Craib. *Appl Sci* 11, 4555.

Tungsukruthai S, Reamtong O, Roytrakul S, Sukrong S, Vinayanwattikun C, Chanvorachote P. 2021. Targeting akt/mTOR and bcl-2 for autophagic and apoptosis cell death in lung cancer: Novel activity of a polyphenol compound. *Antioxidants* 10, 534.

Huangteerakul C, Aung HM, Thosapornvichai T, Duangkaew M, Jensen AN, Sukrong S, Ingkaninan K, Jensen LT. 2021. Chemical-genetic interactions of *Bacopa monnieri* constituents in cells deficient for the DNA repair endonuclease RAD1 appear linked to vacuolar disruption. *Molecules* 26, 1207.

Books & Chapter

2022 Authentication of Chinese Medicinal Materials by DNA Technology: Techniques and Applications, Under the Book Chapter “Barcoding High-Resolutions Melting Analysis”, World Scientific Publishing Co., Inc., Second Edition, 2022, pp. 457–482.

2018 DNA Barcodes of Thai Medicinal Plants for Authentication, Chulalongkorn University Printing House, Bangkok, First Edition, 2018, 181 pages.

2010 DNA Barcodes of Medicinal Plants, Chulalongkorn University Printing House, Bangkok, First Edition, 2010, 192 pages.

Research Grant (Selected)

2024 – 2025 \$55,000 Diversity of *Andrographis paniculata* found in Thailand based on four diterpenoid lactone contents, whole genome sequencing, and transcriptomes for variety selection to meet the demand for desirable compounds, Agricultural Research Development Agency (Public Organization)

2020 – 2022 \$210,000 Production and development of crude extracts from black pepper in the form of soft capsules as dietary supplements, Agricultural Research Development Agency (Public Organization)

2020 – 2021 \$100,000 Research and development of *Crinum latifolium* L. for the treatment of benign prostatic hyperplasia – BPH, Agricultural Research Development Agency (Public Organization)

2020 – 2021 \$110,000 Pharmaceutical technology innovation for minimizing health problems caused by PM2.5, National Research Council of Thailand (NRCT)

2017 – 2020 \$100,000 DNA barcode of medicinal plants in the Monographs of Selected Thai Materia Medica, Thai Traditional Medical Knowledge Fund, Department of Thai Traditional and Alternative Medicine, Ministry of Public Health

Patents The achievement of holding 5 petty patents, showcasing the commitment to innovation and contributing to intellectual property development

December 15, 2023 Petty Patent No. 2303003695, “A Quick and field-deployable CRISPR-Cas12a diagnostic kit for the DNA detection of poison plants containing aristolochic acid, the compound that caused nephropathy”, Suchada Sukrong, Chayapol Tungphatthong, Sunchai Payungporn, and Patcharawalai Whongsiri, Chulalongkorn University

June 4, 2021 Petty Patent No. 2103001539, “Primer set, method for DNA detection of *Aristolochia* genus using that primer set and a kit for the detection of DNA of the *Aristolochia* comprising such primer sets and striped test strips”, Suchada Sukrong and Kannika Thongkhoa, Chulalongkorn University

August 21, 2020 Petty Patent No. 2003002018, “The process of extracting and purifying rutin from banana leaves by crystallization or precipitation” Muenduen Phisalaphong, Panida Yingyuen, and Suchada Sukrong, Chulalongkorn University

September 10, 2020 Petty Patent No. 2003002230, “Mixture for reducing particulate matters”, Suchada Sukrong and Pasarapa Towiwat, Herb Guardian CO., LTD.

August 21, 2020 Petty Patent No. 2003002019, “The process of extracting and purifying rutin from banana leaves by chromatography” Muenduen Phisalaphong, Panida Yingyuen, and Suchada Sukrong, Chulalongkorn University

Award & Honors

2024 – 2027 Expert Honorable Member of the National Herbal Commission,
Department of Thai Traditional and Alternative Medicine, Ministry of Public Health

2023 Gold Medal, FIRI Award (Iran) & Special Prize (Czech Republic)
AristoCheck: Rapid DNA immunochromatographic test kit for detection of toxic *Aristolochia* species, plants causing nephrotoxic,
17th International Invention and Innovation Show (INTARG® 2024), Poland

2022 Gold Medal, Phytfoon PM2.5 removal spray
48th International Exhibition of Inventions Geneva 2022, Switzerland

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- 2021 Nagai Award, Nagai foundation, Tokyo, Japan
Gold Prize, Phytfoon PM2.5 removal spray
Seoul International Invention Fair 2021 (SIIF 2021), South Korea
Gold Medal, Phytfoon PM2.5 removal spray
The XV International Warsaw Invention Show (IWIS 2021), Poland
- 2017 Award Honoring Excellence in Student Affairs,
Office of Student Affairs, Chulalongkorn University
- 2012 Award Honoring Excellence in Teaching and Learning,
Office of Academic Affairs, Chulalongkorn University
- 2010 – Present Honorary Members of International Society for Ethnopharmacology
The ISE promotes a traditional knowledge on medicinal, food and toxic plants and their past, present and future use.
- 2010 – Present Honorary Members of The GP-TCM Research Association, UK
The Association is a non-for-profit organisation dedicated to promoting high-quality evidence-based research of traditional Chinese medicine (TCM) through developing, disseminating and implementing good practice.
- 2008 Cerebos Award, Thailand

Industrial Collaborations

Collaboration with several companies to create health innovations, such as

- 2023 Do Day Dream Public Co. Ltd., Thailand,
The company would like to use innovative herbal extracts in cosmetics and cosmeceuticals
Kaew Mangkorn Bhesaj Co., Ltd., Thailand,
Collaborating with Kaew Mangkorn Bhesaj Company to develop a process for extracting essential substances from herbs, ensuring rigorous quality control at every stage of production
- 2022 T. Man Pharmaceutical Co. Ltd., Thailand,
An MOU has been signed to collaborate with T. Man Pharmaceutical Company in creating health innovations and supporting senior project research
- 2021 Metatechbio Co., Ltd. & Ddoruroo Co., Ltd., South Korea,
Formulation Development: Work with company's cosmetic formulators to develop formulations for the selected product concepts. Experiment with various ingredients, concentrations, and techniques to achieve desired product.
Orex Trading Co. Ltd., Thailand,
Partner with Orex Company in researching medical device innovations
- 2020 Milott Laboratories Co. Ltd., Thailand,
Collaboration for OEM services of personal care items to ensures the high-quality products tailored to consumer needs.
Neopharm Co., Ltd., Thailand,
Cooperating with the company in wholesale distribution of pharmaceutical products. This partnership allows for the seamless procurement.



Professional impact

- Member in Leaders in Innovation Fellowships (LIF)
Newton Fund, Royal Academy of Engineering, United Kingdom
- Member of CU innovation Hub, CU enterprise, Club Chula Spinoff and UHCDP Learners
- Experienced facilitator
The 7 Habits of Highly Effective People course, certified by Franklin Covey

Invited talks

January 10, 2024 Mind Ignite: turns ideas into entrepreneurs STeP CMU, Northern Science Park Thailand, Chiang Mai

January 3, 2024 Sharing IDEs Entrepreneurial Life in StartIDEs & SpinIDEs Program, Cultivating an entrepreneurial spirit for the development of research into an innovation-driven enterprises in the university for postmaster & postdoctoral researchers, CU Innovation Hub & PMU-B

December 22, 2023 Preparation for joint ventures with the private sector Division of Technology Transfer & Intellectual Property, Naresuan University

December 16, 2023 How to create herbal innovations to have value? Starting from zero to millions, Herbal and Food Innovation in 21st Century Workshop (Upskill/Reskill), Faculty of Pharmaceutical Sciences, Chulalongkorn University

August 9, 2023 When the teacher becomes the CEO: Novel Medicine for Mankind Conference, Faculty of Medicine, Prince of Songkla University

June 21, 2023 Tips for creating research and innovation that responds to the industrial sector and develops student learning, Faculty of Pharmacy, Srinakharinwirot University

March 14-15, 2023 Bring your tech to the market, STeP CMU, Northern Science Park Thailand, Chiang Mai
January, 2023 Team Advisor of Nacolepsecure in CUD Hackathon for students from Chulalongkorn University Demonstration Secondary School

2022 & 2023 Good Practices for Innovative Startup Management, University Holding Company Directorship Certification Program (UHCDP), Batch 1 and Batch 2

March 4, 2022 Spin-off: Teach, Research, Business Administration, Club Spinoff Lunch Talk, CUE, Chulalongkorn University

March – May, 2021 Team advisor and Subject Matter Advisor (SMA), Beyond Food Convenience Store by NewSpectrum®, Chulalongkorn Business School (CBS), Chulalongkorn University

March 26, 2021 How to create innovation from Sciences to commercialization, Department of Medical Sciences, Ministry of Public Health

May 6, 2021 How to become an academic entrepreneur: example of my journey, Faculty of Science, Mahidol University

April 20, 2021 Research, Innovation, Teaching, and Learning, Faculty of Nursing, Chulalongkorn University

April 5, 2021 How to do research and become a startup company, Faculty of Allied Health Sciences, Chulalongkorn University

July 1, 2021 How to do research and become a startup company, Faculty of Pharmacy, Mahidol University

November 14, 2020 Technology commercialization, Technology Management and Innopreneurship Program (CUTIP), Chulalongkorn University

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ผู้ช่วยศาสตราจารย์ ทันตแพทย์ ดร.ไพบูลย์ จิตประเสริฐวงศ์
สังกัดสาขาวิชาสุขภาพช่องปากผู้สูงอายุ
สำนักวิชาทันตแพทยศาสตร์

1. ประวัติส่วนตัว (Personal History)

1.1 การศึกษาตั้งแต่ระดับอุดมศึกษา

- 2554 PhD. (Dental Sciences) Institute of Cellular Medicine, Newcastle University, UK
The role of IL-18 in cross-susceptibility between periodontal disease and diabetes mellitus
- 2547 จุฬาลงกรณ์มหาวิทยาลัย วิทยาศาสตร์มหาบัณฑิต (ปริทันตศาสตร์)
Effects of IL-17 on human gingival fibroblasts
- 2543 ทันตแพทยศาสตร์ (เกียรตินิยม) มหาวิทยาลัยขอนแก่น

2. ประวัติการทำงาน

2.1 ปัจจุบันดำรงตำแหน่ง ผู้ช่วยศาสตราจารย์ ในสาขาวิชาสุขภาพช่องปากผู้สูงอายุ

2.2 ได้รับแต่งตั้งให้ดำรงตำแหน่งผู้ช่วยศาสตราจารย์ เมื่อวันที่ 3 เดือนกรกฎาคม พ.ศ. 2560 รวม 7 ปี 3 เดือน

2.3 ตำแหน่งอื่น ๆ (ตามระยะเวลาปฏิบัติหน้าที่หรือไม่เกิน 3 ปีย้อนหลัง)

- 2.3.1. ผู้รักษาการแทนหัวหน้าสถานวิจัย สำนักวิชาทันตแพทยศาสตร์ 17 ต.ค. 2565 – ปัจจุบัน
- 2.3.2. กรรมการสภาวิชาการ ประเภทคณาจารย์ประจำสำนักวิชา 9 มี.ค. 2566 – ปัจจุบัน
- 2.3.3. คณะทำงานเพื่อกลั่นกรองวาระการประชุมสภาวิชาการ 24 มี.ค. 2566 - ก.ค. 2566
- 2.3.4. คณะกรรมการประจำ สำนักวิชาทันตแพทยศาสตร์ 17 ต.ค. 2565 – ปัจจุบัน
- 2.3.5. คณะกรรมการประจำสาขาวิชาสุขภาพช่องปากผู้สูงอายุ 17 ต.ค. 2565 – ปัจจุบัน
- 2.3.6. คณะกรรมการดำเนินการรับนักศึกษา ระดับปริญญาตรี สวทพ. 26 ต.ค. 2565 – ปัจจุบัน
- 2.3.7. คณะอนุกรรมการพิจารณาแฟ้มสะสมผลงาน (Portfolio) ในการคัดเลือกบุคคลเข้าศึกษา
- 2.3.8. คณะอนุกรรมการฝ่ายสอบสัมภาษณ์ในการคัดเลือกบุคคลเข้าศึกษา 26 ต.ค. 2565 – ปัจจุบัน
- 2.3.9. คณะกรรมการหน่วยทันตกรรมพระราชทาน มหาวิทยาลัยเทคโนโลยีสุรนารี 23 พ.ย. 2566 – ปัจจุบัน
- 2.3.10. คณะอนุกรรมการวิชาการ สำนักวิชาทันตแพทยศาสตร์ 15 ส.ค. 2561 – ปัจจุบัน
- 2.3.11. คณะอนุกรรมการวิชาการ ฝ่ายปริคlinik 15 ส.ค. 2561 – ปัจจุบัน
- 2.3.12. คณะอนุกรรมการวิชาการ ฝ่ายคลินิก 15 ส.ค. 2561 – ปัจจุบัน
- 2.3.13. คณะอนุกรรมการประกันคุณภาพ สวทพ. 15 ส.ค. 2561 – ปัจจุบัน
- 2.3.14. คณะกรรมการประจำสถาบันวิจัยและพัฒนา มทส. 17 ต.ค. 2565 – ปัจจุบัน
- 2.3.15. คณะกรรมการดำเนินงานวิจัยคลินิกและนวัตกรรมทางการแพทย์ รพ. มทส. 17 ต.ค. 2565 – ปัจจุบัน
- 2.3.16. กรรมการจริยธรรมการวิจัยในมนุษย์ ประเภทสมทบ 13 ก.ย. 2565 – ปัจจุบัน
- 2.3.17. คณะอนุกรรมการพิจารณาถ่วงดุลและจัดสรรงบประมาณโครงการวิจัย 17 ต.ค. 2565 – ปัจจุบัน
- 2.3.18. คณะกรรมการพัฒนาหลักสูตรอนุปริญญา (ผู้ช่วยทันตแพทย์ชั้นสูง) 24 ก.ค. 2566 – ปัจจุบัน
- 2.3.19. กรรมการคุมสอบนอกตารางของนักศึกษาหลักสูตรทันตแพทยศาสตร์ 27 ก.ค. 2566 – ปัจจุบัน
- 2.3.20. คณะทำงานปรับปรุงกระบวนการและจัดทำระเบียบ และประกาศที่เกี่ยวข้องกับการขอกำหนดตำแหน่งทางวิชาการ 25 เม.ย. 2567 – ปัจจุบัน
- 2.3.21. คณะกรรมการตัดสินการประกวดผลงานวิจัย ในการประชุมวิชาการและเสนอผลงานวิจัยสาขาทันตแพทยศาสตร์ ระดับนานาชาติ ครั้งที่ 20 6-8 พฤศจิกายน 2566
- 2.3.22. คณะกรรมการปรับปรุงหลักสูตรทันตแพทยศาสตรบัณฑิต (หลักสูตรปรับปรุง พ.ศ. 2565) 7 มี.ย. 2564
- 2.3.23. คณะกรรมการขับเคลื่อนการจัดตั้งศูนย์วิจัยทางคลินิก (CRC) 29 ก.ย. 2566 – ปัจจุบัน

- 2.3.24. คณะอนุกรรมการฝ่ายต่าง ๆ งานจัดประชุมวิชาการประจำปี 2566 รพ.มทส. 30 มิ.ย. 2566
- 2.3.25. คณะกรรมการบริหาร CDEC ทันตแพทยสภาวาระที่ 10 30 ธ.ค. 2565 -ธ.ค. 2566
- 2.3.26. คณะกรรมการการศึกษาทันตแพทยศาสตร์ ทันตแพทยสภาวาระที่ 10 30 ธ.ค. 2565 -ธ.ค. 2566
- 2.3.27. แต่งตั้งมีตราจารย์ 30 พ.ย. 2565 – ปัจจุบัน
- 2.3.28. ผู้รักษาการแทนหัวหน้าสาขาวิชาสุขภาพช่องปากผู้สูงอายุ 2 ก.พ. 2561-10 มิ.ย. 2563
- 2.3.29. รองคณบดีสำนักวิชาทันตแพทยศาสตร์ 10 มิ.ย. 2563 - 2564
- 2.3.30. ผู้รักษาการแทนคณบดีสำนักวิชาทันตแพทยศาสตร์ 30 ธ.ค. 2563 - ก.ค. 2565

3. ภาระงานสอน

ระดับ (ปริญญาตรี/ บัณฑิตศึกษา)	รายวิชาที่สอน (บรรยาย/ปฏิบัติการ/การสอนเชิงรุก (PBL) /ปัญหาพิเศษหรือโครงการ)	จำนวนชั่วโมงต่อ สัปดาห์	เปิดสอน(ภาค/ปี การศึกษา)
ปริญญาตรี	904402 ปรีทันตวิทยา2: การจัดการและรักษา (บรรยายปฏิบัติการและPBL)	2.19	2/2566
ปริญญาตรี	DEN03 4002วิทยาเอ็นโดดอนต์ (บรรยาย)	0.20	2/2566
ปริญญาตรี	904501คลินิกสุขภาพช่องปาก 1: ปรีทันตวิทยา (ปฏิบัติการ)	3.0	2/2566
ปริญญาตรี	903601คลินิกสุขภาพช่องปาก 2: สุขภาพช่องปาก องค์รวม(สัมมนาและปฏิบัติการ)	0.25	2/2566
ปริญญาตรี	901601 โครงการวิจัยวิทยาศาสตร์สุขภาพช่องปาก (ปัญหาพิเศษหรือโครงการ)	0.25	2/2566
ปริญญาตรี	903605 คลินิกสุขภาพช่องปาก 4: ประสบการณ์ วิชาชีพทันตกรรมด้านปรีทันตวิทยา (สัมมนาและปฏิบัติการ)	4.5	2/2566
ปริญญาตรี	904411 ทันตกรรมฟันฟู 7: ทันตกรรมรากเทียม (บรรยาย)	0.5	1/2566
ปริญญาตรี	901403 ระเบียบวิธีวิจัยวิทยาศาสตร์สุขภาพช่องปาก (บรรยายและปัญหาพิเศษหรือโครงการ)	1.58	1/2566
ปริญญาตรี	904501 คลินิกสุขภาพช่องปาก 1: ปรีทันตวิทยา (ปฏิบัติการ)	2.10	1/2566
ปริญญาตรี	DEN05 3001 ปรีทันตวิทยา1: พยาธิสภาพ (บรรยายและPBL)	1.50	1/2566
ปริญญาตรี	904401 ปรีทันตวิทยา1: พยาธิสภาพ (บรรยายและPBL)	1.50	1/2566
ปริญญาตรี	901601 โครงการวิจัยวิทยาศาสตร์สุขภาพช่องปาก (บรรยาย)	0.20	3/2565
ปริญญาตรี	904411 ทันตกรรมฟันฟู7: ทันตกรรมรากเทียม (บรรยาย)	0.50	3/2565
ปริญญาตรี	904408 ทันตกรรมฟันฟู4: ฟันเทียมชนิดติดแน่น2 (บรรยาย)	0.20	3/2565

ปริญญาตรี	904501คลินิกสุขภาพช่องปาก 1: ปรีทันตวิทยา (ปฏิบัติการ)	3.0	3/2565
ปริญญาตรี	903601คลินิกสุขภาพช่องปาก 2: คลินิกสุขภาพช่องปากองค์รวม (สัมมนาและปฏิบัติการ)	0.25	3/2565
ปริญญาตรี	901603นวัตกรรมวิทยาการสุขภาพช่องปาก (บรรยายและPBL)	0.69	3/2565
บัณฑิตศึกษา	วิทยาศาสนิพนธ์ ป.เอกนายปณิธาน สนพะเนา	1.50	3/2565
บัณฑิตศึกษา	วิทยาศาสนิพนธ์ ป.โทนายพงษ์ปนต์ พรมงษา	0.50	2/2566
รวมงานสอน = ...44.65...หน่วยภาระงานต่อปี			

4. งานวิจัย นวัตกรรม หรือผลงานทางวิชาการ (Research, Innovations or Academic Works)

4.1 หัวหน้าแผนงานวิจัยการพัฒนาแผ่นเนื้อเยื่ออัจฉริยะสำหรับการสร้างอวัยวะปริทันต์ใหม่จากไคโตแซนและคอลลาเจน รหัสโครงการ R2207494 งบประมาณ 1,330,000 จาก PMU ผู้สูงอายุ วช.

4.2 หัวหน้าโครงการการศึกษาประสิทธิภาพของน้ำยาบ้วนปากที่มีส่วนผสมของสารสกัดหญ้าแฝก มูลนิธิทันตนวัตกรรม ในพระบรมราชูปถัมภ์ มทก.336/2565

4.3 ผู้ร่วมวิจัยบทบาทของสารสกัดคอร์ไดเซปินในการดูแลสุขภาพช่องปากของผู้สูงอายุเบาหวาน ประเภท 2 ที่มีภาวะปากแห้ง สำนักงานการวิจัยแห่งชาติ (วช.) R2207496

4.4 หัวหน้าโครงการย่อย การวิจัยเรื่อง Identification of oral malodor biomarkers in saliva for the application in oral malodor detection kit Fundamental Fund ประจำปีงบประมาณ 2566

4.5 ผู้ร่วมวิจัยโครงการเจลขมิ้นชันรูปแบบโฟโตเซนซิไทเซอร์เพื่อต้านจุลชีพและต้านการอักเสบสำหรับผู้ป่วยโรคปริทันต์ อักเสบเรื้อรังที่ควบคุมระดับน้ำตาลในเลือดได้ไม่ดี Fundamental Fund ประจำปีงบประมาณ 2566 รหัส 179393

4.6 ผู้ร่วมวิจัยโครงการการพัฒนาโพลีเมอร์ อนุภาคนาโน สำหรับนำส่งโปรตีนลูกผสมด้วยยับยั้งชนิดซีครีโทรลิวโคไซด์โปรตีเอส ของมนุษย์ และประยุกต์ใช้ทางชีวการแพทย์ Fundamental Fund ประจำปีงบประมาณ 2566 รหัส 164317

4.7 ที่ปรึกษาการเปรียบเทียบผลของซบสเตรตเชิงตั้งที่มีผลต่อการเปลี่ยนสภาพเซลล์ต้นกำเนิดจากเอนไคดปริทันต์ของฟัน มนุษย์ไปสู่เซลล์ซีเมนต์โตบลาสต์เพื่อสร้างเคลือบรากฟัน Research Brotherhood BR09-906-66-12-02

4.8 ผลงานวิจัยที่ได้รับการเผยแพร่

Sonpanao P, Janebodin K, Namvichaisirikul N, Thongjit S, Jitprasertwong P. The Prevalence of Xerostomia in Older Thai Individuals with Type II Diabetes Mellitus and Its Association with Type of Toothpaste and Oral Functions: A Cross-Sectional Study Using Questionnaires. *Geriatrics (Basel)*. 2023 Jul15;8(4):76. doi:10.3390/geriatrics8040076.

4.9 ผลงานวิจัยที่ได้รับการเผยแพร่

Binlath T, Hutamekalin P, Yongsawatdigul J, Yamabhi M, Jitprasertwong P. Effects of collagen, chitosan and mixture on fibroblast responses and angiogenic activities in 2D and 3D in vitro models. *J Biomed Mater Res A*. 2023 Oct;111(10):1642-1655. doi:10.1002/jbm.a.37561.

4.10 ผลงานวิจัยที่ได้รับการเผยแพร่

Yamabhi M, Khamphio M, Min TT, Some CN, Cuong NC, Aprilia WR, Luesukprasert K, Teeranitayatar K, Maneedaeng A, Tuveng TR, Lorentzen SB, Antonsen S, Jitprasertwong P, Eijsink VGH. Valorization of shrimp processing waste-derived chitosan into anti-inflammatory chitosan-oligosaccharides (CHOS). *Carbohydr Polym*. 2024 Jan 15;324:121546. doi:10.1016/j.carbpol.2023.121546.



5. ผลงานตีพิมพ์

1. Yamabhai M, Khamphio M, Min TT, Soem CN, Cuong NC, Aprilia WR, Luesukprasert K, Teeranitayatarin K, Maneedaeng A, Tuveng TR, Lorentzen SB, Antonsen S, **Jitprasertwong P**, Eijsink VGH. Valorization of shrimp processing waste-derived chitosan into anti-inflammatory chitosan-oligosaccharides (CHOS). *Carbohydr Polym.* 2024 Jan 15;324:121546. doi: 10.1016/j.carbpol.2023.121546. Epub 2023 Nov 2. PMID: 37985116.
2. Binlath T, Hutamekalin P, Yongsawatdigul J, Yamabhai M, **Jitprasertwong P**. Effects of collagen, chitosan and mixture on fibroblast responses and angiogenic activities in 2D and 3D in vitro models. *J Biomed Mater Res A.* 2023 Oct;111(10):1642-1655. doi: 10.1002/jbm.a.37561. Epub 2023 May 24. PMID: 37222462.
3. Binlath T, Uppatcha N, Thepchai J, Pleungtuk Y, Noisa P, Hutamekalin P, **Jitprasertwong P**. Cordycepin attenuates migration and invasion of HSC-4 oral squamous carcinoma cells through autophagy-dependent FAK/Akt and MMP2/MMP9 suppression. *J Dent Sci.* 2022 Oct;17(4):1677-1688. doi: 10.1016/j.jds.2022.03.002. Epub 2022 Mar 20. PMID: 36299321; PMCID: PMC9588793.
4. Binlath T, Thammanichanon P, Rittipakorn P, Thinsathid N, **Jitprasertwong P**. Collagen-Based Biomaterials in Periodontal Regeneration: Current Applications and Future Perspectives of Plant-Based Collagen. *Biomimetics (Basel).* 2022 Mar 24;7(2):34. doi: 10.3390/biomimetics7020034. PMID: 35466251; PMCID: PMC9036199.
5. **Jitprasertwong P**, Khamphio M, Petsrichuang P, Eijsink VGH, Poolsri W, Muanprasat C, Rangnoi K, Yamabhai M. Anti-inflammatory activity of soluble chito-oligosaccharides (CHOS) on VitD3-induced human THP-1 monocytes. *PLoS One.* 2021 Feb 3;16(2):e0246381. doi: 10.1371/journal.pone.0246381. PMID: 33534833; PMCID: PMC7857634.
6. Preshaw PM, Taylor JJ, Jaedicke KM, De Jager M, Bikker JW, Selten W, Bissett SM, Whall KM, van de Merwe R, Areibi A, **Jitprasertwong P**, Al-Shahwani R, Weaver J, Taylor R, Wassall RR. Treatment of periodontitis reduces systemic inflammation in type 2 diabetes. *J Clin Periodontol.* 2020 Jun;47(6):737-746. doi: 10.1111/jcpe.13274. Epub 2020 May 12. PMID: 32106333.
7. Chumponsuk T, Gruneck L, Gentekaki E, **Jitprasertwong P**, Kullawong N, Nakayama J, Popluechai S. The salivary microbiota of Thai adults with metabolic disorders and association with diet. *Arch Oral Biol.* 2021 Feb; 122: 105036. doi: 10.1016/j.archoralbio.2020.105036. Epub 2021 Jan 2. PMID: 33421657.
8. Kaokaen P, Chaicharoenaudomrung N, Kunhorm P, Mesil K, Binlath T, Noisa P, **Jitprasertwong P**. Nanoencapsulation of Cordycepin Induces Switching from Necroptosis to Apoptosis in Human Oral Cancer Cells (HSC-4) Through Inhibition of Receptor-Interacting Serine/Threonine-Protein Kinase 3 (RIPK3) and Autophagy Modulation. *Natural Product Communications.* 2022;17(1). doi:10.1177/1934578X221074838
9. Kaokaen P, Jaiboonma A, Chaicharoenaudomrung N, Kunhorm P, Janebodin K, Noisa P, **Jitprasertwong P**. Cordycepin-loaded Nanoparticles from Cassava Starch Promote the Proliferation of Submandibular Gland Cells and Inhibit the Growth of Oral Squamous Carcinoma Cells. *Nutr Cancer.* 2021;73(10) : 2014- 2029. doi: 10.1080/01635581.2020.1819350. Epub 2020 Sep 15. PMID: 32929998.
10. Sonpanao P, Janebodin K, Namvichaisirikul N, Thongjit S, **Jitprasertwong P**. The Prevalence of Xerostomia in Older Thai Individuals with Type II Diabetes Mellitus and Its Association with Type of Toothpaste and Oral Functions: A Cross-Sectional Study Using Questionnaires. *Geriatrics (Basel).* 2023 Jul 15;8(4):76. doi: 10.3390/geriatrics8040076. PMID: 37489324; PMCID: PMC10366830.
11. Chuinsiri N, **Jitprasertwong P**. Prevalence of self-reported pain-related temporomandibular disorders and association with psychological distress in a dental clinic setting. *J Int Med Res.* 2020 Sep;48(9):300060520951744. doi: 10.1177/0300060520951744. PMID: 32883120; PMCID: PMC7479867.

12. Hormdee D, Rinsathorn W, Puasiri S, **Jitprasertwong P**. Anti-Early Stage of Bacterial Recolonization Effect of *Curcuma longa* Extract as Photodynamic Adjunctive Treatment. *Int J Dent*. 2020 Dec 18;2020:8823708. doi: 10.1155/2020/8823708. PMID: 33381183; PMCID: PMC7765719.
13. Kornphot, B; Saengtharathip, K.; Nontakhot, N.; Sittisorn, Y.; **Jitprasertwong, P.** (2017). FEMALE SEX HORMONES DECREASE MMP-1 AND MMP-8 EXPRESSIONS IN *Porphyromonas gingivalis* LPS-STIMULATED HUMAN GINGIVAL FIBROBLASTS. *Suranaree Journal of Science & Technology*, 2017, Vol 24, Issue 3, p355
14. Sirimethawong, Y., Kriangkrai, R., **Jitprasertwong, P.**, Angwarawong, T., & Chuenjitkuntaworn, B. (2018). Effect of *Aquilaria crassna* crude extract on osteogenic activity of MC3T3E 1 cells.
15. Nile CJ, Barksby E, **Jitprasertwong P**, Preshaw PM, Taylor JJ. Expression and regulation of interleukin-33 in human monocytes. *Immunology*. 2010 Jun;130(2):172-80. doi: 10.1111/j.1365-2567.2009.03221.x. Epub 2010 Jan 11. PMID: 20070408; PMCID: PMC2878462.
16. Jaiboonma A, Kaokaen P, Chaicharoenaudomrung N, Kunhorm P, Janebodin K, Noisa P, **Jitprasertwong P**. Cordycepin attenuates Salivary Hypofunction through the Prevention of Oxidative Stress in Human Submandibular Gland Cells. *Int J Med Sci*. 2020 Jul 6;17(12):1733-1743. doi: 10.7150/ijms.46707. PMID: 32714076; PMCID: PMC7378660.
17. Davies RC, Jaedicke KM, Barksby HE, **Jitprasertwong P**, Al-Shahwani RM, Taylor JJ, Preshaw PM. Do patients with aggressive periodontitis have evidence of diabetes? A pilot study. *J Periodontal Res*. 2011 Dec;46(6):663-72. doi: 10.1111/j.1600-0765.2011.01388.x. Epub 2011 Jun 17. PMID: 21679187.
18. Saitawee D, Teerakapong A, Morales NP, **Jitprasertwong P**, Hormdee D. Photodynamic therapy of *Curcuma longa* extract stimulated with blue light against *Aggregatibacter actinomycetemcomitans*. *Photodiagnosis Photodyn Ther*. 2018 Jun;22:101-105. doi: 10.1016/j.pdpdt.2018.03.001. Epub 2018 Mar 10. PMID: 29535046.
19. **Jitprasertwong P**, Chaisomboon N, Jamdee K. Progesterone, but not β -estradiol, enhances *Porphyromonas gingivalis* lipopolysaccharide-induced vascular endothelial growth factor-A expression in human THP-1 monocytes. *J Dent Sci* 2013; 8: 358–364.
20. **Jitprasertwong P**, Charadram N, Kumphune S, Pongcharoen S, Sirisinha S. Female sex hormones modulate *Porphyromonas gingivalis* lipopolysaccharide-induced Toll-like receptor signaling in primary human monocytes. *J Periodontal Res*. 2016 Jun;51(3):395-406. doi: 10.1111/jre.12320. Epub 2015 Sep 14. PMID: 26364725.
21. **Jitprasertwong P**, Jaedicke KM, Nile CJ, Preshaw PM, Taylor JJ. Leptin enhances the secretion of interleukin (IL)-18, but not IL-1 β , from human monocytes via activation of caspase-1. *Cytokine*. 2014 Feb;65(2):222-30. doi: 10.1016/j.cyto.2013.10.008. Epub 2013 Nov 23. PMID: 24275551.
22. Mahanonda R, **Jitprasertwong P**, Sa-Ard-Iam N, Rerkyen P, Charatkulangkun O, Jansisyanont P, Nisapakultorn K, Yongvanichit K, Pichyangkul S. Effects of IL-17 on human gingival fibroblasts. *J Dent Res*. 2008 Mar;87(3):267-72. doi: 10.1177/154405910808700314. PMID: 18296612.

โครงการวิจัย

1. หัวหน้าโครงการ

1.1 ผลของฮอร์โมนเพศหญิงและการตอบสนองของเซลล์โมโนไซต์จากมนุษย์ต่อแอลพีเอสของเชื้อพอร์ไฟโรโมนเนส จิงจิवालิส
ทุนงบประมาณแผ่นดินประจำปี 2557 งบประมาณ 323,500

1.2 การพัฒนาสเปรย์ช่องปากจากสารสกัดตั้งเชื้อสำหรับการดูแลสุขภาพช่องปากผู้สูงอายุที่มีภาวะปากแห้ง ทุนงบประมาณ
แผ่นดินประจำปี 2562 งบประมาณ 1,800,000

- 1.3 การพัฒนาแผ่นเนื้อเยื่ออัจฉริยะสำหรับการสร้างอวัยวะปริทันต์ใหม่จากโคโดแซนและคอลลาเจน เพื่อการรักษาโรคริทันต์ในผู้สูงอายุ ทุนวิจัยและนวัตกรรมเพื่อรองรับสังคมสูงวัย 2565 งบประมาณ 1,330,000 บาท
- 1.4 การทดสอบคุณสมบัติทางชีวภาพและการผลิตแผ่นเนื้อเยื่ออัจฉริยะสำหรับการสร้างอวัยวะปริทันต์ใหม่จากโคโดแซนและคอลลาเจน ทุนวิจัยและนวัตกรรมเพื่อรองรับสังคมสูงวัย 2565
- 1.5 การศึกษาประสิทธิภาพของน้ำยาบ้วนปากที่มีส่วนผสมของสารสกัดหญ้าแฝก มูลนิธิทันตกรรมในพระบรมราชูปถัมภ์
- 1.6 หัวหน้าโครงการย่อย การวิจัยเรื่อง Identification of oral malodor biomarkers in saliva for the application in oral malodor detection kit Fundamental Fund ประจำปีงบประมาณ 2566 งบประมาณ 300,000 บาท

2. ผู้ร่วมวิจัย

ชื่อโครงการ	ทุนวิจัย	งบจัดสรร (บาท)	ตำแหน่งในโครงการ
1. วัคซีนต่อเชื้อพอร์ไฟโรโมนเนส จินจิวัลิส	ทุนงบประมาณแผ่นดิน ประจำปี 2561	389,000	ผู้ร่วมวิจัย : 20.00 %
2. การพัฒนาโฆสเภสัชภัณฑ์ และ เวชสำอาง จากน้ำตาลสายสั้น โอลิโกแซคคาไรด์ คอซ	ทุนงบประมาณแผ่นดิน ประจำปี 2562	1,600,200	ผู้ร่วมวิจัย : 10.00 %
3. การพัฒนาโพลีเมอร์ อนุภาคนาโน สำหรับนำส่งโปรตีน ลูกผสมตัวยับยั้งชนิดซีรีโทรลิโคไซด์โปรตีนเอสของมนุษย์ และประยุกต์ใช้ทางชีวการแพทย์	Fundamental Fund ประจำปีงบประมาณ 2565	850,000	ผู้ร่วมวิจัย : 20.00 %
4. การสกัดคอลลาเจนและโคโดแซนทางเลือกเพื่อการพัฒนาแผ่นเนื้อเยื่ออัจฉริยะสำหรับการรักษาทางทันตกรรม	ทุนวิจัยและนวัตกรรมเพื่อรองรับสังคมสูงวัย	-	ผู้ร่วมวิจัย : 20.00 %
5. บทบาทของสารสกัดคอร์ไดเซปินในการดูแลสุขภาพช่องปากของผู้ป่วยสูงอายุเบาหวานประเภท 2 ที่มีภาวะปากแห้ง	ทุนพัฒนานักวิจัยระดับบัณฑิตศึกษา ประจำปี 2565	270,000	ที่ปรึกษา : 10.00 %
6. การพัฒนาวิธีการทางเลือกในการป้องกันและรักษาโรคทางทันตกรรมในผู้สูงอายุ	Fundamental Fund ประจำปีงบประมาณ 2566 (ผ่านหน่วยงาน)	1,200,000	ผู้ร่วมวิจัย : 15.00 %
7. เจลขมิ้นชันรูปแบบโฟโตเซนซิไทเซอร์เพื่อต้านจุลชีพและต้านการอักเสบสำหรับผู้ป่วยโรคริทันต์อักเสบเรื้อรังที่ควบคุมระดับน้ำตาลในเลือดได้ไม่ดี	Fundamental Fund ประจำปีงบประมาณ 2566 (ผ่านหน่วยงาน)	189,640	ผู้ร่วมวิจัย : 15.00 %
8. การเพิ่มศักยภาพนักวิจัยระดับหลังปริญญาเอก หลังปริญญาโท เต็มเวลาดำเนินการวิจัยขั้นแนวหน้าและการต่อยอดงานวิจัยใช้ประโยชน์ มหาวิทยาลัยเทคโนโลยีสุรนารี	กองทุนส่งเสริมวิทยาศาสตร์ วิจัยและนวัตกรรม (กองทุน ววน.) : F13 (S4P21)	6,480,000	ผู้ร่วมวิจัย : 4.44 %
9. การพัฒนาแนวทางการป้องกัน รักษา และการฟื้นฟูสภาพของเนื้อเยื่ออ่อนในช่องปากสำหรับผู้สูงอายุ	ประเภท Fundamental Fund ประจำปีงบประมาณ 2567	684,500	ที่ปรึกษาโครงการ : 10.00 %

เกียรติประวัติและรางวัลที่ได้รับ

ลำดับ	รางวัลที่ได้รับ	ประเภท	ปีที่ได้รับ
1.	The first winner of poster competition “การประชุมวิชาการระดับนานาชาติ ด้านวิทยาศาสตร์สุขภาพ The International Conference on Health Care, Science and Technology (ICHST-2018)	Poster presentation	2561
2.	“พนักงานดีเด่นสายวิชาการ ด้านการสอน ประจำปี พ.ศ. 2561” สำนักวิชาทันตแพทยศาสตร์ มทส.	สำนักวิชา	2561
3.	ผู้ได้รับพระราชทานทุนอานันทมหิดล แผนกทันตแพทยศาสตร์	สถาบัน	2550
4.	Research Travel Fund Award, IADR 2010, Barcelona, Spain General session & Exhibition of the International Association for Dental Research (IADR)	Oral presentation	2553
5.	รางวัลอาจารย์สำนักวิชาทันตแพทยศาสตร์ดีเด่น ประจำปี 2562	สำนักวิชา	2562
6.	รางวัลศิษย์เก่าดีเด่น โรงเรียนสรินทร จังหวัดสุรินทร์ ประจำปี 2567	สถาบัน	2567

Oral Presentation for Student Research

Annual
Research
Day

37th

Faculty of Dentistry, Chulalongkorn University

OP-01

An *in vitro* color stability of CAD/CAM artificial denture teeth after exposing to colorant solutions and cleansing agent

Boonyaniwas N*, Trisanawadee C, Rugchoocheep C, Limpuangthip L¹

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Objective To evaluate the color stability and surface roughness of CAD-CAM artificial denture teeth when exposed to various colorant solutions and cleansing agents, in comparison to conventional artificial denture teeth.

Materials and methods A total 160 specimens were manufactured from conventional PMMA-based denture teeth (n=40), conventional composite resin-based denture teeth (n=40), printed denture teeth (n=40), and milled denture teeth (n=40). A total of 10 specimens of each material group are randomly divided and immersed in 4 different staining agents for 8 hours: soft drink, coffee, tea, and reversed osmosis (RO) water. Then, the specimens in each staining agent group is equally subdivided for further immersing in a denture cleaning tablet (Polident; Haleon, United States of America) and RO water which serves as a control for 16 hours at $37 \pm 2^\circ\text{C}$ in an incubator. After each cycle, the staining agent and denture cleaning agents are replenished. The procedures are repeated every 24 hours for 8 weeks. Each group will be tested for two physical properties: color stability and surface roughness at W0 and W8.

Results Printed denture teeth are more discolored than conventional artificial denture teeth. Milled denture teeth and conventional PMMA-based denture teeth are not significantly different. Polident is significantly effective in reducing the discoloration of printed denture teeth in staining agents. Surface roughness is not related to color stability.

Conclusion In terms of color stability, the most to least color change when soaked in water are printed denture teeth, conventional composite resin-based denture teeth, conventional PMMA-based denture teeth, and milled denture teeth respectively. Meanwhile, soaked in Polident shows more color stability. In terms of surface roughness, printed denture teeth and conventional composite resin-based denture teeth are rougher. However, conventional PMMA-based denture teeth and milled denture teeth are indifferent when soaked in both cleansing agents.

Not applicable for Ethics

Supported by Dental Research Fund, Dental Research Project 3200502#10/2023, Faculty of Dentistry, Chulalongkorn University

OP-02

Hydroxyapatite nanoparticle effects on cell viability and migration of fibroblast and oral keratinocyte

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Objective The aim of this experimental study is to evaluate the effects of HA-NPs and HA-NPs-APTES on cytotoxicity and migration of fibroblast and oral keratinocyte and to evaluate future application of HA-NPs as drug delivery systems to fibroblasts and keratinocytes.

Materials and methods Rod-shaped HA-NPs was prepared by hydrothermal method and surface modification with APTES. The biocompatibility of HA-NPs and HA-NPs-APTES were examined with Fibroblast cell line (L929) and Normal Oral Keratinocyte Spontaneous Immortalized Cell Culture (NOK-SI) using MTT assay. We also examine wound healing with Scratch assay to observe the effects on cell migration. Images are analyzed using Image J software and the migration index is calculated. L929 and NOK-SI were treated with HA-NPs-APTES and HA-NPs. The comparison between two groups was compared by one-way ANOVA followed by Tukey HSD post hoc analysis. All statistical analyses were performed using the SPSS statistic. A value of $p < 0.05$ was considered significant.

Results Different concentrations of HA-NPs and HA-NPs-APTES had no cytotoxic effects on both L929 and NOK-SI at 3 time points 24hr, 48hr and 72hr (all cell viability values $>70\%$). After 48 hr, L929 cell growth percentage in mediums containing HA-NPs and HA-NPs-APTES is higher than control cells. In scratch assay, after 24 hr. of incubation shows that all concentration of HA-NPs and HA-NPs-APTES (20, 50 and 100 $\mu\text{g/mL}$) in fibroblast cell have lower ability in cell immigration than control environment. Among different concentrations of HA-NPs and HA-NPs-APTES, 50 $\mu\text{g/mL}$ showed the best result as 87.08, 94.26% respectively. In oral keratinocyte cells, both HA-NPs and HA-NPs-APTES demonstrate higher wound closure at increasing concentrations, with HA-NPs 100 $\mu\text{g/mL}$ showing the best result. All of the group showed higher wound closure compared to the control, except for HA-NP 20 $\mu\text{g/mL}$.

Conclusion HA-NPs-APTES is biocompatible to L929 and NOK-SI. In scratch assay, none of HA-NPs and HA-NPs-APTES concentrations have increased migration rate after 24 hr compared to control. In NOK-SI, both HA-NPs and HA-NPs-APTEs promoted the best migration in concentration 100 $\mu\text{g/mL}$. In future HA-NPs-APTES can be utilized as the safety and potential application as bioactive molecule or drug carrier in alveolar bone augmentation and future skin tissue engineering.

Under Ethical Consideration

Supported by Dental Research Fund, Dental Research Project 3200502#11/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

37th
Annual
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Day

OP-03

Efficacy of resin coating containing 2-methacryloyloxyethyl phosphorylcholine in reducing biofilm formation

Chaichanawongsaraj N, Karaket P, Sontichai W.*, Thongthai P¹, Matangkasombut O², Thanyasrisung P²

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Objective Resin-modified glass ionomer cement (RMGIC) is a commonly used restorative material. However, it suffers from mechanical deterioration when exposed to acid from dental biofilm containing cariogenic bacteria. This study aims to develop a resin coating containing 2-methacryloyloxyethyl phosphorylcholine (MPC) to enhance its anti-biofilm properties while maintaining its surface hardness.

Materials and methods RMGIC specimens (N=9/group) were coated with resin coating containing different concentrations of MPC (1.5%, 3%, 5%, 10%, and 20%), and a control group (standard coating). The surface hardness was measured using a Vickers microhardness tester, while *Streptococcus mutans* biofilm formation was evaluated using crystal violet assay after 24-hour incubation. The experiments were performed in triplicates. The Shapiro-Wilk tests, Kruskal-Wallis H test, and Dunn's post-hoc test with Bonferroni adjustment were used to analyze the surface hardness.

Results The mean surface hardness of RMGIC coated with resin containing 0% (control), 1.5%, 3%, 5%, 10%, and 20% MPC were 48.38±2.16 MPa, 43.18±0.97 MPa, 46.11±2.90 MPa, 39.02±1.81 MPa, 44.76±3.00 MPa, and 35.16±2.54 MPa, respectively. No significant differences in surface hardness among groups was observed ($p > 0.05$), except for that of the 20% MPC group which was significantly lower than that of the control group (Adj. sig. = 0.005 at $p < 0.05$). The preliminary outcome of biofilm formation assay of RMGIC coated with resin containing 0% (control), 1.5%, 3%, 5%, 10%, and 20% MPC was shown via optical density to be 0.43±0.05, 0.24±0.05, 0.06±0.04, 0.23±0.07, 0.31±0.04, 0.8±0.15, respectively.

Conclusion Incorporating up to 10% of MPC into resin coating did not affect surface hardness, while 3% MPC appeared to be the optimum concentration that could prevent biofilm formation. Further experiments are underway to confirm these findings.

Ethical protocol (HREC-DCU 2024 - 081)

Supported by Dental Research Fund, Dental Research Project 3200502#14/2023, Faculty of Dentistry, Chulalongkorn University

OP-04

Factors that influence student proficiency in direct restorations during transition from preclinical to clinical practice

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¹Department of Microbiology, Faculty of Dentistry, Chulalongkorn University

Objective A competency in direct restorations is mandatory for Thai dental professional licensure. To perform direct restoration requires fundamental clinical dental procedures with precise skills and knowledge. Preclinical training may influence the foundation in the cognitive domain to develop the necessary psychomotor domain and appropriate attitudes for clinical practice. This study therefore aims to explore student perceptions during the transition from preclinical to clinical practice and identify key factors influencing success in performing direct restorations. Insights from this research can be used for preparing students to effectively gain competency in clinical practice.

Materials and methods The study uses a mixed-methods approach to assess perceptions of direct restoration among Year 4 and 5 dental students at Chulalongkorn University. Data collection involves a survey with rating scale questions targeting 200 students (70% expected response rate) and focus groups selected from survey participants. The survey evaluates the impact of preclinical courses on clinical performance perception and training gaps. Focus group transcripts will be analyzed by matching keywords from participants' responses to identify themes. Quantitative data will be analyzed using SPSS, and qualitative data will undergo manual analysis to explore the transition from preclinical to clinical practice.

Expected Outcome This research aims to identify challenges and factors influencing dental students' transition from preclinical to clinical training. The findings will guide improvements in curriculum design and support systems, fostering a smoother transition and better educational outcomes.

Conclusion The preclinical-to-clinical transition is a critical phase in dental education that shapes students' growth and professional development. While challenging, it presents opportunities for resilience and confidence-building. Addressing these challenges can empower students and enhance their adjustment to clinical practice.

Ethical protocol (HREC-DCU2024-077)

Supported by Dental Research Fund, Dental Research Project 3200502#16/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

37th
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OP-05

Influence of sequential practicing for motor skill acquisition of non-dominant hand: A randomized controlled trial in undergraduate dental students

Jirojvanichakorn C, Euanontat R, Chuenjitwongsa S¹, Limpuangthip L²

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Background Left-handed dental students inevitably must practice with their non-dominant hand due to the dental instruments, techniques, and dental units that are designed especially for the right-hand dominants. However, the best way to design a curriculum for left-handed dental students has been under-explored.

Objective The study aims to determine the effect of the sequence of hand use, on the efficacy of motor skill acquisition in undergraduate dental students.

Materials and methods Adopting a positivist approach, a four-armed, double-blinded randomized controlled trial was conducted. Dental students from Chulalongkorn University, were randomly assigned to different sequence of hand use in the process of practicing an onlay preparation. Outcomes were evaluated by two prosthodontists and analyzed using descriptive and inferential statistics. Focus-group interviews were conducted for in-depth exploration and were analysed thematically.

Results Bilateral transfer was found to be influential for both cognitive and psychomotor development.

Conclusion The training of the non-dominant hand should involve a curriculum design that allows learners to practice using their dominant hand first. Additionally, other factors that influence curriculum management must be carefully considered.

Under Ethical Consideration

Supported by Dental Research Fund, Dental Research Project 3200502#19/2023, Faculty of Dentistry, Chulalongkorn University

OP-06

Expression of Sirtuin 4 in oral squamous cell carcinoma and oral epithelial dysplasia

Apiwessa T, Chaicharncheep P, Phattarataratip E¹

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Objective Oral squamous cell carcinoma (OSCC) is the most common oral malignancy, with a high incidence in Southeast Asia. A notable number of OSCC cases arise from oral epithelial dysplasia (OED), a condition linked to environmental factors like tobacco, alcohol, and betel quid, and genetic mutations. Sirtuins (SIRT) constitute a group of nicotinamide dinucleotide (NAD⁺) histone deacetylases or ADP-ribosyl transferases that regulate various cellular functions. Sirtuin 4 (SIRT4) has been shown to be involved in the pathogenesis of several cancers. However, its roles in OSCC and OED pathogenesis remain unclear. This study aims to investigate SIRT4 expression in OSCC and OED with clinical-pathologic correlation.

Materials and methods Ninety patient samples, consisting of 30 cases each of the high-grade OED, OSCC, and hyperkeratosis groups, were included. The SIRT4 expression was analyzed by immunohistochemical staining. The correlation between clinicopathological characteristics and SIRT4 expressions was also evaluated.

Results SIRT4 predominantly localized in the cytoplasm of squamous epithelial cells. Its immunoreactivity was variable among OED and OSCC, compared with hyperkeratosis.

Conclusion The differential SIRT4 expression is present and may play a role in OED and OSCC development.

Ethical protocol (HREC-DCU 2024-052)

Supported by Dental Research Fund, Dental Research Project 3200502#30/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

37th
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OP-07

I want to be a dental specialist! : what and how internal factors influence decision making on selecting a postgraduate dental programme?

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Objective Undergraduate dental education plays a crucial role in transforming students to competent practitioners, while postgraduate education advances and enhances practitioners' proficiency. However, factors influencing selection of postgraduate dental specialty programme, especially internal factors, remain underexplored. This research aims to explain which and how internal factors influence dental practitioners when choosing their postgraduate studies.

Materials and methods Adopting critical theory and explanatory mixed-method was implemented. The target population included first, third, and sixth-year undergraduate students, and postgraduate students currently studying at Chulalongkorn University. Quantitative data was collected through online questionnaires, while qualitative data was obtained via semi-structured interviews for triangulation purposes. Data was analysed using descriptive statistics and thematic analysis.

Results Eighty-one students participated in the study (response rate = 50%). Work-related happiness was found to be the most influential to students at every stage. Novice students tended to have idealistic views of their future, with little consideration of external factors. Experience provided little effect on their postgraduate decision. In contrast, competent students prioritized personal interest and direct experiences involving students, teachers, patients, and procedures over other factors, while academic achievement and indirect experiences were of least importance

Conclusion Internal factors played a critical role in the selection of postgraduate dental specialties, whereas external factors were mainly perceived as constraints. Direct experience was found to be more influential than indirect experience when choosing postgraduate education.

Ethical protocol (HRDC-2024-086)

Supported by Dental Research Fund, Dental Research Project 3200502#34/2023, Faculty of Dentistry, Chulalongkorn University

OP-08

Association of oral bacteriome and mycobiome and the development of oral candidiasis following topical corticosteroid therapy in patients with oral lichen planus

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Objective Oral lichen planus (OLP) is a chronic inflammatory mucosal condition managed primarily with topical corticosteroids (TCS). However, a common adverse effect of TCS is an increased risk of oral candidiasis. This study aimed to investigate baseline differences in oral bacteriome and mycobiome profiles between OLP patients who developed oral candidiasis during TCS treatment and those who did not.

Materials and methods This study used a nested case-control design within a randomized controlled trial, where oral rinse samples were collected from symptomatic OLP patients at baseline before TCS treatment. Twelve participants were recruited into this study: six who developed candidiasis and six who did not, based on clinical and microbiological criteria at 2- and 4-week follow-ups. Candida colonization was examined by plating an aliquot of concentrated oral rinse samples on Sabouraud Dextrose Agar supplemented with antibiotics. Candida cultures were quantified, with 10³ CFU/mL as a cut-off for high level of colonization. The remaining oral rinse samples were extracted for 16S rRNA and ITS sequencing using an Illumina MiSeq platform.

Results Twelve female OLP patients with an average age of 53.17 ± 11.31 years were included in this study. Candida culture revealed that 67% of patients who developed candidiasis after treatment had high levels of colonization at baseline, compared to 33% in those who did not. While differences in the magnitude or the prevalence of Candida between groups were not statistically significant, the candidiasis group demonstrated a trend toward higher colonization levels. Bacteriome and mycobiome sequencing results are currently pending.

Conclusion Preliminary findings suggest a potential link between elevated baseline Candida colonization and the development of oral candidiasis in OLP patients undergoing TCS therapy. Further analysis of the bacteriome and mycobiome are underway to elucidate the association of microbial composition at baseline and the risk of oral candidiasis during TCS treatment.

Ethical protocol (HREC-DCU 2024-066)

Supported by Dental Research Fund, Dental Research Project 3200502#35/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

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OP-09

Accuracy of oral examination and teledentistry in diagnosing dental caries and gingivitis

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Background This research aims to compare the accuracy of intraoral mobile phone photographs and visual dental examination in diagnosing dental caries and gingival diseases. The findings from this study will contribute to the AI approach for caries and gingivitis screening.

Materials and methods Junior high school students from grades 7 to 9 were examined by a calibrated dentist and had their intraoral photographs taken using a smartphone camera. Dental caries and gingival health were assessed using a modified DMFT index and visible plaque and calculus detection, respectively. The photographs were recorded and coded by two undergraduate dental students. Image-based findings were compared to clinical examination results to evaluate sensitivity, specificity and accuracy. Data security measures ensured confidentiality throughout the study.

Results sixty-two students were enrolled and the data consisted of 474 images covering 1,702 teeth. The sensitivity and specificity of the teledentistry method for tooth status compared to clinical assessment were 62.90 percent and 99.40 percent respectively. The sensitivity and specificity of gingival assessment were 69.09 and 97.14 percent. The sensitivity of treatment needed was lowest in sealant (42.16 percent) and highest in pulp care (100 percent). The specificity of treatment needed was almost comparable, which ranged from 96.94 to 99.82 percent. The accuracy of treatment needed was highest in pulp care and extraction (Accuracy = 99.83). The inter-rater reliability ranged from good to almost perfect agreement (Kappa = 0.76-1.00).

Conclusion The teledentistry approach using mobile phone images reveals acceptable diagnostic accuracy for screening caries and calculus. However, its effectiveness in assessing treatment needs remains limited and requires further improvement.

Ethical protocol (HREC-DCU 2024-106)

Supported by Dental Research Fund, Dental Research Project 3200502#35/2023, Faculty of Dentistry, Chulalongkorn University

OP-10

Transcriptome profile of human macrophages in co-cultured with human supracrestal gingival connective tissue-derived MSCs

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Objective The supracrestal gingival connective tissue (SG) is situated near the gingival sulcus, exposing it to the diverse microorganisms in dental plaque biofilms. This tissue is crucial for maintaining periodontal health. Disruption of SG leads to inflammation, loss of periodontal support, and apical migration of the junctional epithelium. SG-derived mesenchymal stem cells (SG-MSCs) may play a role in maintaining tissue homeostasis in these areas. However, the mechanisms by which SG-MSCs modulate inflammation in periodontitis are not well understood. Macrophages are essential for tissue destruction and repair in periodontal diseases. Understanding the interaction between SG-MSCs and macrophages is key to harnessing the therapeutic potential of SG-MSCs for periodontal regeneration. This study aimed to investigate the interactions between SG-MSCs and macrophages through the transcriptome analysis focusing on immune modulation.

Material and methods Peripheral blood monocytes from three donors were differentiated into macrophages (HMDMs), while SG-MSCs were isolated from a healthy donor. SG-MSCs were expanded and characterized for MSC markers, colony-forming ability, and differentiation potential. HMDMs were cultured alone or co-cultured with SG-MSCs under transwell conditions. Total RNA of HMDMs was extracted for RNA sequencing to analyze differentially expressed genes (DEGs), followed by bioinformatics for functional enrichment analysis.

Results Pathway enrichment analysis revealed significant differences in DEGs between HMDMs and HMDMs co-cultured with SG-MSCs. In the co-culture condition, upregulated biological processes included cell chemotaxis, extracellular matrix organization, and cytokine-mediated signaling. Cellular components showed enhanced extracellular matrix organization, while molecular functions highlighted significant upregulation of oxidoreductase activity. KEGG pathway analysis further revealed notable upregulation of the cytokine receptor interaction pathway. Key upregulated DEGs, such as CCL1, CCL24, CXCL5, CXCR5, IL1B, and TGFB2, were associated with chemotaxis and macrophage activity.

Conclusion This study identifies key DEGs supporting the role of SG-MSCs in modulating macrophage chemotactic activity, underscoring their potential in periodontal inflammation regulation and tissue regeneration.

Under Ethical Consideration

Supported by Dental Research Fund, Dental Research Project 3200502#38/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

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PP-01

Factors affecting the pain intensity of patients undergoing lower third molar surgical removal

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Objective Postoperative pain from lower third molar surgical removal is a common concern, yet factors such as swelling, anesthesia type, and concurrent procedures remain insufficiently studied. Understanding these can improve patient outcomes and dental education. This study investigates factors associated with the intensity of pain for patients undergoing third molar surgical removal by dental students.

Materials and methods This is a prospective cohort study in order to identify factors influencing postoperative pain following mandibular third molar removal. This study will be performed at the Oral Surgery Clinic, Faculty of Dentistry, Chulalongkorn University, and 200 patients aged ≥ 18 years will be recruited by simple randomization from June to December 2024. Inclusion criteria include a patient having at least one impacted lower third molar and fulfilling health criteria (ASA I-II). Criteria of exclusion include emergent cases, pregnancy, cognitively impaired subjects, any chronic pain-related conditions, or severe systemic ill health. Dental students, under the supervision of a highly experienced oral surgeon, conduct the procedures based on standard protocols. Postoperative pain is measured with the VAS for seven days. Scores are described as mild for scores from 1 to 3, moderate from 4 to 6, and severe from 7 to 10. Preoperative and intraoperative data were collected with questionnaires: anxiety, tooth position, surgical difficulty, and anesthesia type. Swelling, use of analgesics, antibiotics, and any complications are recorded daily in an online form filled by the patient. SPSS is used for data analysis, using chi-square tests and logistic regression to determine which factors significantly predict pain. Ethical approval was obtained, and all participants provided informed consent, ensuring confidentiality and voluntariness throughout the study.

Expected Results In all subjects, there was no significant differences ($p < 0.05$) between age, sex, race, smoking status, contraceptive use, Pell and Gregory classification, experience of patient in oral surgery treatment. type of dentist, experience of dentist, duration of operation, type of local anesthetics, flap design, treatment procedure, type of wound closure, application of wound dressing material or hemostatic agent, exposure of inferior alveolar nerve, intraoperative complications, prescribed drugs and others based on the data provided. This may be due to the uniformity in outcomes or limitations in data variability (24 subjects were collected).

Expected Conclusion This study investigated factors influencing postoperative pain in patients undergoing mandibular third molar removal by dental students. The chi-square analysis revealed no significant association between postoperative pain levels and factors such as the type of impaction, flap design, sutural technique, or anesthesia type ($p > 0.05$). These findings suggest that these procedural and anatomical variables may not play a significant role in determining pain intensity. While the results highlight the potential uniformity of pain outcomes across different surgical approaches, it is essential to consider individual patient factors, which were not statistically significant in this analysis but may still contribute to variability in pain perception. Future research with a larger sample size could provide more insights into the determinants of postoperative pain. Understanding these factors will help refine surgical techniques, enhance patient care, and improve dental education practices in managing third molar extractions.

Ethical protocol (HRDC-DCU2024-087)

Supported by Dental Research Fund, Dental Research Project 3200502#1/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

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PP-02

Investigation into patient satisfaction regarding implant-supported crowns and abutments using different materials, and the influence of different complications

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Objective This study aims to compare patient satisfaction with implant-supported crowns and abutments made from different materials and to identify which complications of implants are factors that affect patient satisfaction.

Materials and methods After obtaining the treatment records of patients who have received dental implants at the Faculty of Dentistry, Chulalongkorn University, patients were divided into multiple groups regarding material of crown, implant abutment. All participating patients in the research study were required to complete a satisfaction questionnaire which was administered to patients via the QuestionPro survey website. The collected data was analyzed by the SPSS program. The analysis of the collected data was divided into two parts. The first part was comparing patient satisfaction between patient groups. The second part aims to identify which aspects of patient satisfaction are affected by the complications of implants, using regression analysis to determine the influencing factors.

Expected Results and Conclusion

Under Ethical Consideration

Supported by Dental Research Fund, Dental Research Project 3200502#2/2023, Faculty of Dentistry, Chulalongkorn University

PP-03

Low temperature irrigation and pain reduction after impacted lower third molar removal

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Objective Our research aims to study the reduction of pain after lower jaw wisdom tooth extraction using saline at normal temperature and room temperature, by comparing data from the VAS assessment and questionnaires.

Our research aims to compare the severity of pain in two groups of patients who underwent wisdom tooth extraction using low-temperature saline for irrigation. The severity values will be obtained from patients filling out a pain assessment form using the VAS criteria, with the goal of developing a wisdom tooth extraction method that results in reduced postoperative pain in the future.

Materials and methods This experiment consisted of 12 patients, who were randomly divided into 2 groups. The sample size was determined by G*Power program based on VAS scores from previous study (3). The calculation was based on hypothesis of two dependent means, with a 0.05 type I error and 0.05 type II error. A total sample size of n=10 is a minimum required sample size. Considering 20% compensation for loss to follow-up, a total sample size of n=12 is required.

Twelve patients were randomly ordered to get the third molar impaction surgery with different temperature of normal saline irrigation (10°C and normal temperature). The randomization of order was generated by computer (calculator.net). Bilateral impacted third molars (a total of 24 teeth) were removed from each patient at 2 different operation times. In each patient, one impacted third molar was determined as the test group (10 °C saline irrigation) and the other impacted third molar as the control group (normal temperature of normal saline irrigation). Patients were blinded to the temperature of normal saline irrigation.

The VAS measurement scale had been used in this research in order to collect data of postoperative pain from patients in 6 hours, 12 hours and 1 day after the operation. The VAS measurement scale was explained to all patients before the surgery and VAS measurement scale paper form was given to all of them. All patients were asked to fill in the information in the VAS measurement scale paper form at home in the time of 6 hours, 12 hours and 1 day after the operation.

Expected Results and Conclusion

Under Ethical Consideration

Supported by Dental Research Fund, Dental Research Project 3200502#3/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

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Density of iNOS-positive M1 and CD206-positive M2 macrophages in medication-related Osteonecrosis of the jaw (MRONJ)

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Objective This study aimed to evaluate the density and spatial distribution of M1 (iNOS-positive) and M2 (CD206-positive) macrophages in the MRONJ tissue sections to explore their roles in disease pathogenesis.

Materials and methods Tissue sections from 12 patients diagnosed with medication-related osteonecrosis of the jaw (MRONJ) were subjected to immunohistochemical staining. M1 macrophages were identified using inducible nitric oxide synthase (iNOS) as a marker, while CD206 served as the marker for M2 macrophages. Three regions of interest (ROIs) were randomly selected from each sample, focusing on inflammatory tissue. Positive cells for iNOS and CD206 were quantified using QuPath software for precise analysis. Statistical comparisons of macrophage densities revealed insights into the inflammatory dynamics of MRONJ.

Results This study examined tissue sections from 12 patients diagnosed with MRONJ, with a mean age of 75.8 years and predominantly females (93.33%). A significant majority of these patients had a history of Alendronate use, a bisphosphonate drug administered for over three years in either oral or intravenous forms.

Immunohistochemical analysis provided key insights into macrophage distribution in the MRONJ tissue sections. M1 macrophages (iNOS-positive cells), associated with pro-inflammatory responses, constituted 9.23% of the analyzed cells within inflammatory tissues, contributing to the chronic inflammation characteristic of MRONJ. In contrast, M2 macrophages (CD206-positive cells), linked to anti-inflammatory and tissue repair processes, comprised 5.14% of cells in granulation tissue and adjacent soft tissues.

Conclusion This study highlights the potential role of macrophage polarization in the pathogenesis of MRONJ. The observed imbalance between pro-inflammatory M1 and anti-inflammatory M2 macrophages may contribute to chronic inflammation and impaired healing. These findings indicate that therapeutic strategies targeting macrophage activity could be explored as a means to support tissue repair.

Ethical protocol (HREC-DCU 2024-103)

Supported by Dental Research Fund, Dental Research Project 3200502#4/2023, Faculty of Dentistry, Chulalongkorn University

PP-05

Comparing local anesthetics efficacy between lidocaine and mepivacaine in healthy young adults: A Double-blind clinical pilot study

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Introduction Clinical comparisons between lidocaine and mepivacaine have yielded inconsistent results. While some studies report no significant differences in their analgesic efficacy, others suggest that mepivacaine may offer distinct advantages in particular clinical settings.

Objective The present study intends to resolve the uncertainties surrounding the comparative efficacy of these two local anesthetics.

Materials and methods This double-blind, randomized clinical pilot study was conducted to evaluate the onset and duration of anesthesia following inferior alveolar nerve blocks (IANB) administered with either 2% lidocaine with 1:100,000 epinephrine or 2% mepivacaine with 1:100,000 epinephrine in a cohort of healthy young adults. A total of 62 participants, selected from 80 fourth-year dental students at the Faculty of Dentistry, Chulalongkorn University, Thailand, met the inclusion criteria. The study cohort comprised 18 males (29%) and 44 females (71%).

Results A total 62 out of 80 participants fulfilled the inclusion and exclusion criteria which was selected from 80 fourth-year dental students at the Faculty of Dentistry, Chulalongkorn University, Thailand. The participants were randomly assigned into two groups: Group A (n = 28), which received 2% lidocaine (9 males, 19 females), and Group B (n = 34), which received 2% mepivacaine (9 males, 25 females). The results of this study were calculated using IBM SPSS statistics version 29.0.0, employing a two-tailed Independent T-test to compare mean of onset time and duration of action between both anesthetics and Chi-Square test to present descriptive statistics. The mean onset time for mepivacaine was 5.52 minutes, while for lidocaine it was 5.17 minutes, with no statistically significant difference between the two anesthetics (P = 0.435). Regarding duration of action, the mean duration for mepivacaine was 234.32 minutes, while lidocaine had a mean duration of 214.25 minutes, and no significant difference was found (P = 0.073). There was no statistically difference in the mean onset time and duration of action between males and females for either lidocaine (onset; P = 0.820, duration of action; P = 0.053) or mepivacaine (onset; P = 0.943, duration of action; P = 0.823). The complication was found in just one case which refers to having a temporary headache in mepivacaine group. Therefore, the incidence of no adverse effect was 97.1% for mepivacaine and 100% for lidocaine, with no statistically significant difference (P = 1.00). Additionally, the success rate was 91.2% for mepivacaine and 78.6% for lidocaine, with no statistically significant difference between the two anesthetics (P = 0.277).

Conclusion This double-blind, randomized clinical trial demonstrated no statistically significant differences in the onset time, duration of action, or overall effectiveness between 2% lidocaine with 1:100,000 epinephrine and 2% mepivacaine with 1:100,000 epinephrine for inferior alveolar nerve blocks in healthy young adults. These findings suggest clinical equivalence between the two anesthetics. Given the comparable clinical outcomes and the generally lower cost of lidocaine, it may represent a more cost-effective option for dental anesthesia.

Ethical protocol (HREC-DCU-P 2024-001)

Supported by Dental Research Fund, Dental Research Project 3200502#5/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

37th
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PP-06

Analyzing color, surface roughness, and microhardness on the unpolished and polished surfaces of occlusal splint materials from conventional and CAD-CAM fabrication methods

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Objective To evaluate the color, surface roughness, and microhardness of occlusal splints fabricated using conventional and CAD-CAM techniques and to compare the properties of the unpolished and polished surfaces.

Materials and methods A total of 114 specimens ($10 \times 10 \times 5 \text{ mm}^3$) were prepared, including one group each of self-cured (SC) and heat-cured (HC) occlusal splints, along with two groups each of milled (ML-A and ML-B) and 3D-printed (3D-A and 3D-B) splints. One side of each specimen was polished using a sequence of 600-, 800-, and 1000-grit sandpaper, followed by pumice and tallow. The specimens were then tested for color parameters (L^* , a^* , b^*), surface roughness (Ra), and Vickers microhardness (HV). Statistical analysis was performed using SPSS version 29.0.

Results Significant variations were observed in color, surface roughness, and microhardness across the six materials ($p < 0.05$). The highest and lowest values were observed in ML-B and SC for L^* , SC and 3D-B for a^* , and HC and SC for b^* . The two with the lowest Ra were ML-A and ML-B. The highest HV values were found in ML-B and HC. Polishing significantly altered the properties, with differences in $L^* > a^* > b^*$, reduced Ra across all groups, and decreased the HV in HC and 3D-B groups.

Conclusion Occlusal splint materials fabricated using different techniques had significant differences in color parameters, surface roughness, and microhardness. Polishing significantly influenced these properties. Material selection and polishing are essential considerations for optimizing splint performance in dental patients with various oral conditions.

Not applicable for Ethics

Supported by Dental Research Fund, Dental Research Project 3200502#6/2023, Faculty of Dentistry, Chulalongkorn University

Comparative evaluation of sodium ascorbate and ascorbic acid on the shear bond strength of resin composite attachments following enamel bleaching: *In vitro* study

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Objective This study aims to evaluate the effects of various antioxidants, at different concentrations and application times, on the shear bond strength (SBS) of resin composite attachments to bleached enamel, and examine the distribution of composite remnants (Composite Remnant Index) between groups.

Materials and methods A total of 105 extracted human premolars were used in this study. A negative control (Group 1) (no bleaching, no antioxidant) and a positive control (Group 2) (no antioxidant) were assigned with 15 teeth in each group. The remaining 75 teeth were equally divided into 5 groups, based on different antioxidant solution used at varying concentration and application times as follows: Group 3 (10% sodium ascorbate, 10 min), Group 4 (10% vitamin C from Watsons Vitamin C 1000 - bio™, 10 min), Group 5 (50% vitamin C from Watsons Vitamin C 1000 - bio™, 3 min), Group 6 (10% vitamin C from Blackmores Bio C 1000™, 10 min), Group 7 (50% vitamin C from Blackmores Bio C 1000™, 3 min). All groups except the negative control group received bleaching treatment of 35% hydrogen peroxide gel. After bonding with composite on buccal surface, SBS of specimens were tested with a universal testing machine after being stored in artificial saliva for 24 hours. Tukey's HSD test was used for homogeneous variances and Dunnett's T3 test for heterogeneous variances. Composite Remnant Index was compared using Chi-square test.

Results The shear bond strength (SBS) of the negative control group (n = 4) exhibited a mean maximum stress of 18.3156 MPa (±5.9011 MPa).

Conclusion Preliminary findings confirm the baseline SBS values between enamel and composite without bleaching or antioxidant treatment. Data collection for the positive control group and experimental groups is ongoing. Further experimentation with antioxidants is necessary to determine their efficacy in restoring SBS.

Under Ethical Consideration

Supported by Dental Research Fund, Dental Research Project 3200502#7/2023, Faculty of Dentistry, Chulalongkorn University

PP-08

Accuracy assessment of 3D facial swelling measurement with novel technique using rigid reference

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Objective This study aimed to compare the volume assessed from Meshmixer processed by our novel measurement method using rigid references in 3D facial scans to the exact volume measured by a densitometer. Intended to develop new methods of assessing postoperative swelling after third molar impaction surgery, in order to benefit future research.

Materials and methods This experimental study comprised of 9 boluses of silicone putty (3 boluses of each 5 ml, 15 ml, and 50 ml) representing artificial swellings. The exact volume of each artificial swelling was first calculated using a densitometer and eureka method. Each artificial swelling was then attached to the mannequin, biting our rigid reference and was scanned respectively by H3 Lumino 3D Face Scanner. The STL files were imported into Meshmixer software to generate the volume difference between preoperative and postoperative swellings. For statistics, the SPSS version 26.0 software was used to perform one sample t-test to evaluate the significance of variations between the outcomes of the novel measurement and the exact volume attached to the mannequin's cheek.

Results According to the one sample t-test, the volumes obtained from novel measurement and the exact volumes measured by densitometer in 5 ml, 15 ml, and 50 ml specimens show no significant difference ($p < 0.05$).

Conclusion The volume measurement obtained by our novel method using rigid references in 3D facial scans processed through Meshmixer is valid to assess postoperative swelling following third molar impaction surgery in the range of 5 to 50 ml. However, further studies experimented in vivo are suggested for a stronger affirmation.

Not applicable for Ethics

Supported by Dental Research Fund, Dental Research Project 3200502#8/2023, Faculty of Dentistry, Chulalongkorn University

PP-09

Magnetic bioprinting of salivary gland mucoepidermoid cancer organoids for precision oncology

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Objective 1) To generate viable ductal-like and sphere-like salivary gland (SG) mucoepidermoid carcinoma (MEC) organoids via magnetic 3D bioprinting; 2) To determine the phenotypic properties of bio-printed ductal-like MEC organoids and sphere-like MEC.

Materials and methods The A253 MEC cell line was cultured in DMEM/F12 with 10% FBS, L-glutamine, and antibiotics, and expanded up to 70-80% confluency. Cells were then dissociated, assessed for viability with Trypan Blue, and seeded in a 96-well plate at density of 1×10^5 and 2×10^5 cells/well. For 3D culture, magnetic 3D bioprinting (M3DB) was used to create MEC spheroids with dot magnetic drives and ductal-like organoids with ring magnet drives in ultra-low attachment plates. Morphology and lumen formation were analyzed using phase contrast microscopy and ImageJ version 2 software package (NIH). Viability was assessed with an ATP luciferase assay, and immunostaining for epithelial and cancer markers was performed. Statistical analysis was done using GraphPad Prism software with a significance set at 5%.

Results Spheroid morphology was observed on day 1, 3, 5, 7, and 9. Significant increases in diameter were noted by day 3, 5, 7, and 9 ($p < 0.0001$), with diameter ranging from 300 to 350 μm . The ATP production significantly increased and peaked on culture day 3 until day 5. Sphere-like organoids highly expressed E-cadherin, Ki67 and Cytokeratin (K) 14 (K14), and possessed low levels of K18. This indicates the presence of proliferative basal progenitor cells and luminal ductal differentiation in these organoids. Ductal organoids were observed in 2 densities, 1×10^5 and 2×10^5 cells/well, for five days. Stable ductal-shape organoid sizes were observed by day 2. The higher cell density showed a 2-fold larger inner lumen diameter and greater lumen-forming efficiency. Histology evaluation revealed cellular organization and tumor-like architecture, confirming the successful biofabrication of ductal-like MEC organoids. Fluorescence staining showed evenly distributed Calcein AM and high K5 expression but less abundant K18-positive cells. Limited late apoptotic markers (propidium iodide staining) were found mainly between the luminal and basal layers.

Conclusion Besides sphere-like MEC organoids, M3DB successfully generates viable ductal-like organoids showing a lumenized architecture and epithelial cancer markers found in native human MEC biopsies. This new protocol and MEC organoid platform can aid in the drug development and screening for suppressing cancer in MEC patients.

Not applicable for Ethics

Supported by Dental Research Fund, Dental Research Project 3200502#9/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

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PP-10

The use of AI chatbots among students and staff of the Faculty of Dentistry, Chulalongkorn University

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Objective This study investigates the prevalence of AI chatbots usage and explores perceptions of their use among students and staff of the Faculty of Dentistry, Chulalongkorn University.

Materials and methods An explanatory sequential mixed-methods study was employed. Quantitative data were collected by online questionnaires distributed to students and staff of the Faculty of Dentistry, Chulalongkorn University. Qualitative data were obtained via interviews from voluntary informants who responded to the questionnaire and the representative of the faculty policy makers. Data were collected between September and November 2024. Quantitative analysis involved descriptive statistics, while thematic analysis was used for qualitative data.

Results Of the 370 participants, 244 (65.9%) had used AI chatbots, with students (90.3%) being the primary users compared to professors (86.7%) and staff (25.4%). ChatGPT was the most popular platform (99.6%), primarily utilized for searching information (83.6%), summarizing content (77%), and grammar correction (60.2%). Students primarily used AI chatbots for homework and research writing, whereas professors and staff employed them for research and administrative purposes. Key benefits were time-saving (95.1%) and improved efficiency (91.8%), but concerns included unreliable sources (74%), incorrect data (73%), and plagiarism risks (66.3%). Despite limited guideline awareness, satisfaction was high, with 98.8% planning to continue using chatbots. The qualitative analysis highlighted a cautious optimism, with participants emphasizing the potential for AI chatbots to enhance efficiency and innovation when integrated responsibly. The suggestion revealed the importance of targeted training and ethical guidelines to maximize the benefits of AI chatbots in dental education and practice.

Conclusion AI chatbots have significant potential to improve efficiency in education and the workplace while addressing challenges related to data reliability, validity and ethical considerations. These findings will help guide strategy development for integrating AI chatbots responsibly, contributing to curriculum development and improved education and work.

Ethical protocol (HREC-DCU 2024-057)

Supported by Dental Research Fund, Dental Research Project 3200502#12/2023, Faculty of Dentistry, Chulalongkorn University

Factors influencing the sufficient dental waste management practice among dental personnel in dental clinics across Bangkok

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Background Dental waste management is crucial for public health and environmental sustainability. It is not only a legal obligation by The Ministry of Public Health of Thailand (MoPH) but also a responsibility because this process affects the health and safety of other individuals and the environment. This study aims to evaluate the factors influencing proper dental waste management and provide information on dental waste separation to encourage responsible waste management contributing to a more eco-friendly dental industry.

Materials and methods This study was conducted using an online questionnaire completed by dental personnel of dental clinics in Bangkok, Thailand. The data consisted of the demographic characteristics and groups of questions designed to determine dental personnel's knowledge, attitude, and practices. The collected data were analyzed using SPSS.

Results Most participants in the study were female, aged between 20–29 years, with a bachelor's degree. Most were dentists, over 5 years of work experience, 3–6 units per dental clinic, 55.7% were responsible for disposing of dental waste, and 84% received waste segregation training. The participants with adequate practice and knowledge scores were 57.72% and 59.06%, respectively. The participants with 3–5 years of work experience were likely to have adequate practice scores while participants aged 30-39 years old and who had a good attitude in topics of eco-centric concerns, interventionist policies, and environmental threats tended to have adequate knowledge scores significantly.

Conclusion The study highlights gaps in dental waste management knowledge and practices among dental personnel, potentially leading to health and environmental risks. Key factors influencing proper practices include 3–5 years of work experience, while adequate knowledge is associated with being aged 30–39 years and having positive attitudes toward environmental issues. By addressing these factors and raising awareness, sustainable waste management practices in the dental industry can be significantly improved.

Ethical protocol (HRDC-DCU 2024-056)

Supported by Dental Research Fund, Dental Research Project 3200502#9/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

37th
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Research
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PP-12

Oral health survey of knowledge, attitude, belief, and behavior among undergraduate students of Chulalongkorn University

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Objective This study aims to compare oral health knowledge, attitudes, beliefs, and behaviors among students at Chulalongkorn University.

Materials and methods Oral health-related data on knowledge, attitudes, beliefs, and behaviors were collected using an online questionnaire via Google Forms. Participants were categorized into three groups: Dentistry (D), Health Sciences (HS), and Non-Health Sciences (N-HS). The questionnaire, which covered topics such as dental caries, gingivitis, and oral health care, consisted of five sections with a total of 40 questions: knowledge (15), attitude (6), belief (4), self-efficacy (4), and behavior (11). Descriptive statistics, Chi-square tests, and one-way ANOVA were performed using SPSS version 29.0.1.

Results A total of 297 students participated in the study, with 99 from each group. The participants' ages ranged from 18 to 32 years, with an average age of 21.15 (SD = 2.00). Of the participants, 64% were female. The results indicated significant differences in average total knowledge scores among the groups, with Dentistry scoring 13.46 (SD = 0.99), Health Sciences scoring 10.31 (SD = 1.94), and Non-Health Sciences scoring 9.24 (SD = 2.30) out of 15. The Dentistry group had the highest average score for every question, followed by the Health Sciences group and then the Non-Health Sciences group. All groups maintained positive attitudes toward dental caries, gingivitis, and oral health care, which align with current theoretical data. Dental students exhibited the highest positive attitudes and beliefs, followed by health science students and non-health science students. Additionally, self-efficacy and behavior concerning oral health care indicated that all groups felt confident in their abilities and demonstrated appropriate oral health care behaviors. However, despite the trend being similar across groups, the results were statistically significantly different.

Conclusion Students in health-related disciplines often demonstrate a deeper understanding of oral health related practices compared to their peers in non-health-related fields.

Ethical protocol (HREC-DCU 2024-083)

Supported by Dental Research Fund, Dental Research Project 3200502#15/2023, Faculty of Dentistry, Chulalongkorn University

Effectiveness of oral pathology mobile application in undergraduate preclinical dental education

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Objective This study evaluates the impact of a mobile application, PathoPal, on preclinical dental students' diagnostic skills, their perceptions of technology-enhanced education, challenges in integrating the application, and academic outcomes compared to traditional methods.

Materials and methods Ninety third-year dental students from Chulalongkorn University participated in the 2024 academic year course Abnormalities and Diseases of the Craniofacial Complex. Data were collected using three questionnaires developed on Google Forms. Two of the questionnaires collect participants' grade point average (GPAX) and diagnostic skills on 10 unknown cases. Participants earned a score of 1 if a correct definitive diagnosis was included in their differential diagnosis. Scores with and without the intervention were compared. The third questionnaire collected qualitative feedback on the application's usability and effectiveness. Statistical analysis was performed using SPSS at a 5% significance level, with the Kolmogorov-Smirnov test for normality and the Mann-Whitney U test for mean score differences.

Results Participants' GPAX ranged from 2.00 to 4.00, indicating academic homogeneity. A significant improvement in diagnostic scores was observed with the application (mean \pm SD: 6.46 \pm 1.96 vs. 4.85 \pm 1.91 without the app, $p < 0.05$). However, diagnostic time increased significantly with application use (22:36 vs. 18:38, $p < 0.05$). Qualitative feedback indicated the application helped reduce diagnostic confusion, especially for less experienced users, although some expressed concerns about its reliability. Suggestions included adding real clinical images, patient histories, and advanced tools like image recognition.

Conclusion PathoPal significantly enhances diagnostic accuracy but increases the time required; therefore, providing guidance to less experienced users is beneficial. The application's reliance on foundational knowledge and limited features highlight areas for improvement. Further development is essential to maximize its potential as a diagnostic tool.

Ethical protocol (HRDC-2024-029)

Supported by Dental Research Fund, Dental Research Project 3200502#17/2023, Faculty of Dentistry, Chulalongkorn University

PP-14

Red cabbage extract as a plaque pH indicator

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Objective This study aimed to develop a plaque-disclosing agent that indicates pH through color changes from anthocyanin, a compound found in red cabbage.

Materials and Methods Anthocyanin solutions were prepared by dissolving the powder in deionized water (DIW) and then were diluted in buffers to cover a pH from 3 to 10. The color between pH 4 and 6 was indistinguishable to the naked eye, so absorbance measurements were used instead. The absorbance at 533 nm of each solution was measured and plotted against its pH. The plaque pH was calculated using the standard curve. To evaluate anthocyanin's application in measuring plaque pH, twenty-eight participants aged 8-23 were recruited. They refrained from toothbrushing for 48 hours and from eating, drinking, or chewing gum for 2 hours before the experiment. After a 1-minute rinse with 10% sucrose solution, a plaque sample was collected, suspended in DIW, and centrifuged. The supernatant was mixed with an anthocyanin solution. The absorbance of the mixture was measured, and the plaque pH was calculated from the standard curve. The pH of the same supernatant was also measured using a pH meter. The precision of the pH from anthocyanin application was evaluated using ICCs (95% confidence intervals), compared with the values obtained from a pH meter.

Results The ICCs (95% confidence intervals) were 0.766 (0.203-0.948) for pH values below 4.5, 0.711 (0.229-0.913) for pH values between 4.5-5.0, and -0.825 (-0.958-0.403) for pH values above 5.0. The precision was categorized as good for pH values below 4.5, moderate for pH values 4.5-5.0, and poor for pH values 5.0.

Conclusion Anthocyanin exhibited potential as a pH indicator, but its color change is most noticeable below pH 4.5, while the common typical plaque pH ranges from 4 to 7. Further research is needed to optimize this indicator for this range.

Ethical protocol (HRDC-2024-049)

Supported by Dental Research Fund, Dental Research Project 3200502#18/2023, Faculty of Dentistry, Chulalongkorn University

The impact of prosthodontic treatment on nutritional status, food diversity and depression in older adults: A cohort study

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Objective The purpose of this study is to gain insight into whether prosthodontics treatment have an impact on the nutritional status and dietary choices of patients and understand the correlation between depression in older adults and prosthodontics treatment allows for effective patient management and dietary advice, contributing to an improved quality of life for the patients.

Materials and methods A total of 43 participants aged 60 years and above were recruited for this study. Participants were also required to be patients at the Prosthodontics Department of the Faculty of Dentistry at Chulalongkorn University. Data collection was performed using a structured questionnaire designed to assess nutritional status, dietary diversity, and depression levels in older adults. The data collection was divided into three phases: T0– prior to receiving prosthetic dental treatment, T1– 45 days following prosthetic dental treatment, and T2 – 90 days (about 3 months) after receiving prosthetic dental treatment, along with 45 days of dietary counseling. Data analysis will be conducted using appropriate statistical tests, Friedman test or One-way repeated ANOVA, to evaluate differences in nutritional status, dietary diversity, and depression levels in older adults before and after receiving prosthodontic treatment.

Expected results The study could show a significant increase in the intake of essential nutrients, such as protein, vitamins, and minerals, following prosthodontic treatment. This may be particularly notable at T1 (45 days post-treatment), as participants begin to adjust to their new prosthetics, with further improvements at T2 (90 days) as they settle into regular eating habits. There might be a measurable increase in the variety of foods consumed, with participants reporting a broader spectrum of food choices (e.g., more fruits, vegetables, whole grains, and proteins). This increase in dietary diversity would likely be noticeable at both T1 and T2 as participants gain confidence in eating and experience less discomfort. Since the participants' depression levels are relatively low at the onset of the study, there may be limited room for further improvement. As a result, any changes in depression scores are likely to be subtle and may not be statistically significant. This is because the participants are already in a positive mental state, and the prosthodontic treatment may not induce a marked improvement in their emotional well-being, which is already within a relatively favorable range.

Expected Conclusion In conclusion, this study aims to assess the impact of prosthodontic treatment on the nutritional status, dietary diversity, and depression levels in older adults. By collecting data at three distinct phases—before treatment (T0), 45 days after treatment (T1), and 90 days after treatment with dietary counseling (T2)— Based on the data analysis, we expect to observe significant improvements in nutritional status and dietary diversity following prosthodontic treatment, particularly as patients regain the ability to chew a wider variety of foods. Additionally, it is anticipated that these improvements will correlate with a reduction in depressive symptoms, reflecting the positive psychological effects of enhanced oral health. The findings of this study will contribute to a deeper understanding of how prosthodontic treatment can improve the overall well-being of older adults, not only by addressing physical health concerns but also by positively influencing mental health. Future research should explore long-term outcomes and the effectiveness of dietary counseling as part of holistic care for elderly patients.

Ethical protocol (HREC-DCU 2024 - 088)

Supported by Dental Research Fund, Dental Research Project 3200502#20/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

37th
Annual
Research
Day

Home repair fractured acrylic denture using nitrocellulose and cyanoacrylate adhesives in comparison to conventional method

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Objective This study aimed to compare bond strength of repaired acrylic denture by using cyanoacrylate, nitrocellulose and conventional method.

Materials and methods A total of 48 specimens of rectangular shape heat-polymerized acrylic resin with 60 × 10 × 3.3 mm dimension were fabricated and polished with #400 silicon carbide sandpaper disc. 24 specimens were divided into 3 groups 8 samples each. Group 1 specimens, used as control group, are bonded by autopolymerizing acrylic with 2 mm gap between specimens. Group 2 specimens are bonded by cyanoacrylate (superglue). Group 3 specimens are bonded by nitrocellulose. The other 24 specimens undergo similar test except they are tested after thermocycling 5000 cycles in water with temperature ranging between 5 °C and 55 °C to reproduce the oral environment. Bond strength of each group will be tested by a Universal Testing Machine, SHIMADZU. The results will be compared by One-way ANOVA.

Results Flexural strength of cyanoacrylate has no difference compared to conventional method, while nitrocellulose has significant difference compared to conventional method and cyanoacrylate at 0.05 significance level. After 5000 cycle thermocycling, flexural strength of cyanoacrylate has no difference compared to conventional method, while nitrocellulose has significant difference compared to conventional method and cyanoacrylate at 0.05 significance level.

Conclusion Cyanoacrylate is a favorable choice for temporary home repaired denture due to its bond strength which has no significant

Not applicable for Ethics

Supported by Dental Research Fund, Dental Research Project 3200502#21/2023, Faculty of Dentistry, Chulalongkorn University

A retrospective study of mucous extravasation phenomenon in Thais (2014-2023)Thithithamcharoen K*, Rattanakhlaew N*, Songkroh P*, Chantarangsu S¹¹Department of Oral Pathology, Faculty of Dentistry, Chulalongkorn University

Objective To determine the prevalence, demographic, and concordance between clinical diagnosis and histopathological diagnosis of mucous extravasation phenomenon observed in a 10-year period (January 2014 to December 2023) at the Department of Oral Pathology, Faculty of Dentistry, Chulalongkorn University.

Materials and methods The study was approved by Human Research Ethics, Faculty of Dentistry Chulalongkorn University (Study Code: HREC-DCU 2024-059). Biopsy records over a 10-year period (2014–2023) were reviewed from the Department of Oral Pathology, Faculty of Dentistry, Chulalongkorn University. Oral and maxillofacial lesions diagnosed as mucous extravasation phenomenon, mucocele, ranula and mucus escape reaction were reviewed and clinical characteristics including age, sex, location, history, symptom, dimension of the lesion, clinical diagnosis, histopathological diagnosis and history of recurrence were collected. The data were analysed using IBM SPSS Statistics for Windows, Version 29.0.

Results Oral mucoceles were identified in patients with a mean age of 23.51 ± 14.88 years (range: 1-82), with female predominance (52%; F:M ratio: 1.08:1). The mean lesion dimension was 8.84 ± 4.69 mm (range: 2-45 mm). The lower labial mucosa was the most frequently affected site (70.3%), followed by the ventral tongue surface (12.6%), floor of mouth (8.3%), and buccal mucosa (6.6%). Most lesions were asymptomatic (93.7%), with a history of trauma (33.7%) and recurrence (40.6%). Clinical diagnoses matched histopathological findings in 90.9% of cases. Alternative clinical diagnoses included irritation fibroma (42.6%), mucous retention cyst (8.5%), lipoma (6.4%), pyogenic granuloma (6.4%), and squamous papilloma (6.4%).

Conclusion Oral mucoceles predominantly manifest in young populations and in the lower labial mucosa with a significant recurrence rate of approximately 40%. The lesion is consistently recognized by clinicians through clinical examination.

Ethical protocol (HREC-DCU 2024 - 059)

Supported by Dental Research Fund, Dental Research Project 3200502#22/2023, Faculty of Dentistry, Chulalongkorn University

Stability and bactericidal activity of chemical disinfectantsThoedsiriphat P*, Uawithya E*, Ampornaramveth R¹, Thotsaporn K²¹Department of Microbiology, ²Department of Biochemistry, Faculty of Dentistry, Chulalongkorn University

Purpose Understanding the shelf life of disinfectants is essential for their effective and safe usage in practices. Disinfectants that contain oxidizing agents are often recommended to be prepared fresh daily for optimal effectiveness. This study aims to evaluate the stability and bactericidal activity of chemical disinfectants, including oxidizing and non-oxidizing agents when stored in appropriate containers for 4 weeks.

Materials and methods Chlorhexidine (Chx), Povidone-iodine (Iodine), and Sodium hypochlorite (NaOCl) were prepared by diluting the disinfectants to achieve final concentrations of 0.5% NaOCl, 0.5% Iodine, and 0.12% Chx and stored in amber PET bottles at 25 °C. The efficacy of these disinfectants was evaluated at various storage times, including 0, 1, 2, and 4 weeks, by exposing cultures of *S. aureus*, *S. typhi*, and *P. aeruginosa* to the chemical disinfectants for 10 minutes before determining the remaining bacterial using serial dilution and plate count methods. The stability of Chx and Iodine was analyzed by measuring absorbance at specific wavelengths with a spectrophotometer, while the stability of NaOCl was assessed through iodometric titration. Statistical analysis was conducted using the Shapiro-Wilk and Kruskal-Wallis H test.

Results No significant changes were observed in the absorbance of active molecules from either non-oxidizing, Chx, or oxidizing groups, Iodine, and NaOCl, over the various storage times, up to 4 weeks. NaOCl and Iodine demonstrated excellent bactericidal activity with a 100 percent reduction against all species tested. Chlorhexidine exhibited lower and variable bactericidal activity. However, there were no statistically significant differences in bactericidal effects among the various storage time points.

Conclusion The stability and bactericidal activity of the disinfectants tested showed no significant differences within one month when stored in a closed amber PET bottle. Diluted Chx, Iodine, and NaOCl can be stored for up to one month without altering efficacy.

Not applicable for Ethics

Supported by Dental Research Fund, Dental Research Project 3200502#23/2023, Faculty of Dentistry, Chulalongkorn University

PP-19

Evaluating the effectiveness of the oral health literacy learning program for health professionals in enhancing oral health knowledge among Thai patients

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Background Oral health literacy (OHL) is a key indicator of oral health, serving as the foundation for acquiring accurate and reliable information about oral care. To ensure patients achieve a high level of OHL, healthcare professionals must thoroughly understand OHL and be capable of explaining it systematically. This study aims to 1) assess whether dental assistants can effectively use an OHL learning program to educate Thai patients accurately and 2) dental assistants can enhance their own oral health knowledge through the OHL process.

Materials and methods A training program involving 30 dental assistants from 8 clinics was designed to improve OH and patient-centered care (PCC). Participants will undergo three assessments: a pre-training test (Pre-test), an immediate post-training test (1st Post-test), and a post-teaching test (2nd Post-test). These assessments will utilize questionnaires and video analysis. Each dental assistant will conduct patient education sessions lasting 15–30 minutes per session, with a minimum of 15 sessions per month. Patient consent for video recording will be obtained. Videos of the sessions will be analyzed by specialists using predefined checklists to ensure adherence to teaching standards.

Expected Results and Conclusion

Under ethical consideration

Supported by Dental Research Fund, Dental Research Project 3200502#24/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

37th
Annual
Research
Day

The effect of brushing simulation on the mechanical properties of restorative materials

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Objective The purpose of this study was to evaluate the effect of brushing on the mechanical properties of restorative materials.

Materials and methods The specimens were divided into four groups ($n = 10$): conventional glass ionomer cement (F9), resin-modified glass ionomer cement (F2), conventional resin composite (CC), and bulk-fill resin composite (BF). All specimens underwent a brushing procedure for 5,000 and 10,000 cycles. Surface roughness and volume loss were subsequently measured using a contact profilometer. The data were analyzed using a two-way mixed ANOVA with LSD post hoc analysis.

Results The number of brushing cycles significantly impacted surface roughness ($p < 0.001$), whereas the type of restorative materials did not affect the surface roughness ($p = 0.563$). After 10,000 brushing cycles, the surface roughness of CC, F9, and F2 significantly increased ($p < 0.001$). The type of restorative materials significantly influenced volume loss ($p = 0.007$). Specifically, the volume loss of F2 was substantially greater than that of CC and BF after both 5,000 and 10,000 brushing cycles ($p < 0.005$) and was also significantly higher than F9 after brushing 10,000 cycles ($p = 0.025$).

Conclusion The brushing had a significant impact on the surface roughness of CC, F9, and F2. Additionally, F2 demonstrated a higher susceptibility to volume loss compared to CC, BF, and F9, indicating that F2 might possess lower wear resistance when subjected to repeated brushing cycles.

Not applicable for Ethics

Supported by Dental Research Fund, Dental Research Project 3200502#25/2023, Faculty of Dentistry, Chulalongkorn University

Identifying essential life skills from the perspective of Dental students at Chulalongkorn University: A qualitative research

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Objective This study aims to analyze and identify the key components of life skills, explore variations in their perception among dental students, and determine the most valued life skill components to understand their priorities and perspectives.

Materials and methods Eight participants, comprising four undergraduate and four graduate dental students from Chulalongkorn University, were purposefully sampled based on their academic excellence. A focus group interview using semi-structured questions was conducted, and the data were analyzed through content analysis.

Results The analysis identified nine key components of life skills as perceived by dental students: cognitive, problem-solving, leadership, observation, communication, adaptability, self-management, empathy, and lifelong learning. Among these, the ranking of life skill components was as follows: cognitive skills were ranked 1st, communication skills 2nd, self-awareness skills 3rd, self-management skills 4th, and adaptability skills 5th.

Conclusion Cognitive, communication, self-awareness, self-management, and adaptability skills are considered the most important life skill components by dental students for their professional and personal development in the dental field.

Ethical protocol (HREC-DCU 2024-075)

Supported by Dental Research Fund, Dental Research Project 3200502#26/2023, Faculty of Dentistry, Chulalongkorn University

Effect of similarity to root anatomy design in dental implant of mandibular first molar on stress distribution using finite element analysis

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Objective This research aims to compare the stress distribution at bone-implant interface and the bone surface between customized implant designs which resembles the shape of the alveolar bone socket (2 roots) and a modified conventional dental implant for mandibular first molar teeth under the same amount of occlusal load.

Materials and methods A CBCT dataset of a left mandibular region containing the first molar was selected from a patient with informed consent DICOM images file were reconstructed into a 3D multi-component model using Ansys SpaceClaim. The model consisted of structures of original tooth, root analogue dental implant with 2 roots, 1 root, and surrounding bone. Stress analysis in terms of the von Mises stress and principal stress were analyzed using finite element analysis in Ansys Workbench.

Expected Results and Conclusion

Ethical protocol (HREC-DCU 2024-048)

Supported by Dental Research Fund, Dental Research Project 3200502#28/2023, Faculty of Dentistry, Chulalongkorn University

Evaluating the effectiveness of the dentist voice-controlled assistant web application vs dental assistants in periodontal charting

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Objective The study aims to compare the effectiveness of the Dentist Voice-Controlled Assistant Web Application with a dental assistant in recording periodontal charts.

Materials and methods The study recruited 10 postgraduate students (4 males and 6 females) in the Periodontology program. Periodontal charting was conducted using a half-mouth randomization method: one half of the mouth was charted using the voice-controlled application, while the other half was charted by a dental assistant. Accuracy was assessed by comparing the errors recorded by the application to those recorded by the assistant. User satisfaction was assessed using a questionnaire.

Results The dental assistant's mean error rate (2.44 ± 1.54 %) was significantly lower than the application's (15.07 ± 10.53 %) ($p=0.004$). Among females, the assistant's error rate was also significantly lower ($p=0.01$). However, among males, no significant difference was observed ($p=0.148$). The mean charting time for the application was 16.09 ± 7.20 minutes, compared to 11.40 ± 2.34 minutes for the dental assistant. However, no significant difference was detected ($p=0.051$). Moreover, no differences in charting time were observed by gender ($p=0.451$ for males, 0.08 for females). Half of the participants were very satisfied with the program, while 40% were moderately satisfied. Half of the participants were most likely or very likely to recommend the application to others, while 40% were moderately likely.

Conclusion The voice-controlled application exhibited higher error rates in voice capture, particularly for female voices. Nevertheless, its ease of learning and ability to generate charts immediately after examinations indicate potential for improvement.

Ethical protocol (HREC-DCU 2023-65)

Supported by Dental Research Fund, Dental Research Project 3200502#29/2023, Faculty of Dentistry, Chulalongkorn University

**Comparative analysis of maximum bite force on conventional versus milling occlusal splints:
A pilot study**

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Objective The purpose of the pilot study was to compare the maximum bite force on occlusal splint fabricated using two different techniques: the conventional method and the milling method.

Materials and methods A total of four female participants, aged 20–25 years, with permanent dentition, fully erupted first and second molars in all quadrants, no pathology of the teeth or periodontium, a need for occlusal splint treatment, an overjet and overbite of 2 ± 1 mm, and a midline shift of less than 1 mm were included in the study. Each participant performed three clenching attempts on the occlusal surfaces of the right and left mandibular first molars using occlusal splints fabricated in conventional and milling methods. The mean maximum bite force was then calculated for both sides of the occlusion.

Results The average maximum bite force from both sides of the occlusion was calculated and evaluated for each participant. The results showed no statistically significant difference between the two methods ($P = 1.000$).

Conclusion It was concluded that the average maximum bite force was not different between conventional and milling occlusal splints.

Ethical protocol (HREC-DCU-P 2024-003)

Supported by Dental Research Fund, Dental Research Project 3200502#31/2023, Faculty of Dentistry, Chulalongkorn University

Surface characterization of different areas of cementum in human third molars

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Objective The aim of this study was to investigate surface morphology and characteristics of cementum in human third molars.

Materials and method Six extracted third molar teeth were collected and cleaned. Each specimen was divided into three regions of interest (cervical, middle, and apical thirds), and then micro-CT images were randomly captured using micro-CT SkyScan 1272. for the morphology and characteristics of the cementum surface such as object volume and porosity were analyzed using CTA software. Statistical analysis was performed on the obtained data.

Results Micro-CT analysis revealed. The apex region exhibited the highest object volume (73.9%) and lowest total porosity (26.0%), followed by the cervical (71.3% volume, 28.7% porosity) and middle regions (70.6% volume, 29.4% porosity). Open porosity values ranging from 25.7% to 29.2% with minimal closed porosity ranging from 0.25% to 0.4%. Structure thickness (0.015-0.02 mm) and separation (0.007-0.008 mm) measurements remained consistent throughout all regions. However, Kruskal-Wallis test revealed no statistically significant differences between regions for all measured parameters (p=0.368).

Conclusion There is no statistically significant differences in all parameters among the regions.

Ethical protocol (HREC-DCU 2024-082)

Supported by Dental Research Fund, Dental Research Project 3200502#32/2023, Faculty of Dentistry, Chulalongkorn University

PP-26

Efficacy of disclosing tablets with water soluble food coloring agents on dental plaque staining

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Objective To compare the plaque staining ability and level of nonspecific staining to soft tissue, skin, and wash basin of food coloring disclosing tablets with clinical-use erythrosine dye and evaluate the effectiveness of plaque disclosing agent in facilitating plaque removal.

Materials and Methods The study assessed three disclosing tablets: A) Erythrosine, B) D&C Red No. 33, and C) a mixture of D&C Red No. 33 and green powder. Eleven participants chewed the tablets before and after brushing, with images of their anterior teeth captured to measure color intensity using the ImageJ program and plaque scores. A questionnaire evaluated plaque visibility and nonspecific staining on teeth, lips, tongue, oral mucosa, and sink immediately after and one hour post-oral care.

Results There was no significant difference in color intensity and plaque scores between the groups before and after brushing. However, plaque scores significantly decreased post-brushing in all groups. questionnaire responses showed significant VAS score differences between groups.

Conclusion Both erythrosine and other food coloring disclosing tablets effectively stain plaque and improve oral care.

Ethical protocol (HRDC-2024-051)

Supported by Dental Research Fund, Dental Research Project 3200502#26/2023, Faculty of Dentistry, Chulalongkorn University

Sex determination of mandibular ramus using lateral cephalogram: Thai populational studySopavanusnitikul P, Atchararужи P, Pittayapat P¹¹Department of Radiology, Faculty of Dentistry, Chulalongkorn University

Objective To evaluate the efficacy of mandibular ramus parameters using lateral cephalograms in sex determination on Thai individuals.

Materials and methods 160 lateral cephalograms of Thai patients, age 20-40 years old, at the Department of Radiology, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand, were retrospectively collected. Linear measurements of 4 mandibular ramus parameters, condylar height (ConH), coronoid height (CoH), ramus height (RH) and ramus width (RW), were done on Infinitt software. Twenty percent of the samples were re-examined after 4 weeks to evaluate intra-observer agreement. Difference between male and female subjects was evaluated using an independent t-test. Significant level was set at $p < 0.05$. Sex determination was analyzed using univariate and multivariate (forward stepwise techniques) binary logistic regression. Logistic response function was assessed on separated group of samples. Intraclass correlation coefficients (ICC) were used to evaluate intra-observer agreement.

Results Intra-observer reliability resulted in the ICC 0.996 (95% CI 0.995-0.997). Statistically significant differences between males and females were found in 3 parameters except RW ($p < 0.001$). Both univariate binary logistic regression and multivariate binary logistic regression revealed that ConH and CoH were the most effective parameters in sex determination. Logistic regression function was generated: $P(\text{Male}) = \frac{e^{\text{Reg}}}{1 + e^{\text{Reg}}}$. Reg was calculated from $\text{Reg} = -16.156 + 0.099(\text{ConH}) + 0.165(\text{CoH})$; e: exponential function. Setting the cut-off point at 0.6, the overall correct sex prediction was reported at 72.5% on tested samples.

Conclusion This study has shown significant differences of condylar height (ConH) and coronoid height (CoH) between Thai males and females. The efficacy of sex determination by using ConH and CoH could be achieved at 72.5%. Although the results are promising, additional parameters should be evaluated to further improve the accuracy of this model.

Ethical protocol (HREC-DCU 2024-074)

Supported by Dental Research Fund, Dental Research Project 3200502#37/2023, Faculty of Dentistry, Chulalongkorn University

Applying highly transparent superhydrophobic coating on glass coverings of rear-surface dental Mouth mirrors

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Introduction Dental practitioners commonly deal with water droplets adherence and foggy vision on mouth mirrors due to the usage of airtors and oral cavity's humidity, resulting in obstructed visibility during indirect view and elevated chair-time.

Objective To fabricate highly transparent superhydrophobic coatings on glass coverings of dental mouth mirrors with thermal stability for long-term use in dental procedures

Materials and methods Superhydrophobic coatings were fabricated using a sol-gel method combined with dip coating on glass slides. The silica sol was prepared through the hydrolysis and condensation of tetraethoxyorthosilicate (TEOS), modified with hexamethyldisilazane (HMDS), and further enhanced with hydrophobic silica nanoparticles (7–40 nm) to improve hydrophobicity. The coatings were evaluated for water contact angle, sliding angle, transmittance (using a spectrophotometer), anti-fog performance, heat tolerance (subjected to 200°C in a hot air oven for 1 hour), and autoclave tolerance under standard sterilization conditions.

Results Coated glasses demonstrated significantly higher transmittance and contact angles compared to bare glasses ($p < 0.05$). Heating up to 200 degrees celcius did not significantly affect contact angle ($p > 0.05$) or sliding angle ($p > 0.01$). The coatings showed enhanced anti-fog properties and thermal stability, though durability under autoclave conditions was limited.

Conclusion The sol-gel method prepared in this study successfully produces a high transparent superhydrophobic coating with high thermal stability and enhanced anti-fog properties. However, the coating's durability under autoclave condition is limited, emphasizing the need for further improvements to ensure its reliability and effectiveness in practical use of mouth mirrors that undergo frequent sterilization and mechanical force.

Not applicable for Ethics

Supported by Dental Research Fund, Dental Research Project 3200502#39/2023, Faculty of Dentistry, Chulalongkorn University

PP-29

Factors influencing the occurrence of oral recurrent aphthous stomatitis in dental students in Faculty of Dentistry, Chulalongkorn University

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Objective To identify the prevalence of recurrent aphthous stomatitis (RAS) and determine the factors that influence the occurrence of RAS in dental students in the Faculty of Dentistry, Chulalongkorn University

Materials and methods The study was approved by Human Research Ethics, Faculty of Dentistry Chulalongkorn University (Study Code: HREC-DCU 2024-097). One hundred seven Thai undergraduate dental students from the Faculty of Dentistry, Chulalongkorn University during the academic year 2024, who agreed to participate by completing the questionnaire, were recruited. The reliability of the questionnaire was analyzed using Cronbach's Alpha, resulting in 1.0, indicating good reliability. The online questionnaire collected demographic data including age, sex, current medications, underlying diseases, manifestation of RAS (major, minor and herpetiform), and factors/behaviors associated with RAS including sleeping habits, smoking, alcohol consumption, exercise and water consumption behaviors. The data were analysed using IBM SPSS statistical software version 29. The p -value <0.05 was considered a statistically significant difference. Differences between participants with RAS and without RAS were done using the chi-square test and Mann-Whitney U test. Multivariate logistic regression was used to identify factors associated with the occurrence of RAS.

Results The average age of the participants in this study was 21.8 ± 3.4 years. Most of them were female (60.7%). The prevalence of RAS (minor, major and herpetiform types) in this group of dental students was 14%, 1.9%, and 0.9%, respectively. Alcohol consumption at least one day per week was associated with the occurrence of minor RAS ($p=0.042$). The occurrence of minor RAS was higher in alcohol drinkers (28%) than non-drinkers (9.8%). Multivariate logistic regression adjusted by age and sex indicated that the occurrence of RAS increased 3.9 times in participants with alcohol consumption at least one day per week (OR: 3.928; 95% CI: 1.189-12.974; $p=0.025$). The other factors showed no statistically significantly associated with the occurrence of RAS ($p>0.05$).

Conclusion The prevalence of RAS in this group of dental students was 14%. There was an association between alcohol consumption with the occurrence of RAS.

Ethical protocol (HREC-DCU 2024-097)

Supported by Dental Research Fund, Dental Research Project 3200502#40/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

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**A comparison between London Atlas, Demirjian and Cameriere age estimation methods
in Thai children and adolescents**

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This study aims to compare dental ages estimated by three methods—the London Atlas, Demirjian et al., and Cameriere et al.—to the chronological age to assess their accuracy and suitability for use in Thai children and adolescents. Additionally, the study sought to identify which method was the most accurate. Panoramic radiographs from 420 Thai individuals (179 males and 241 females) aged between 7 and 20 years were selected for the examination. Each radiograph was analyzed using all three methods, focusing on teeth from the left side of the jaws. The London Atlas method compares the subject's dentition to a dental development and eruption chart. Demirjian et al. method categorizes teeth into eight developmental stages, from crown formation to root closure, which are converted into scores to estimate age. Cameriere et al. method, on the other hand, applies root apex width, tooth length, and the number of teeth with closed apices to a formula to calculate age. The pooled results indicate that Cameriere et al. method provides the most accurate estimates for ages 8 to 11 and 13 years, while Demirjian et al. is the most accurate for ages 12 to 16 years, and the London Atlas is the most reliable for ages 17 to 18 years. Similar trends were observed in separated male and female samples. These findings may be explained by the limitations of Demirjian et al. and Cameriere et al. methods, which give the maximum age estimates of 16 and 14 years (14.51 for male and 14.23 for female), respectively. In summary, each method shows varying accuracy across the age range. Therefore, selecting the most suitable method depends on the assumed age group and purpose of the dental age estimation.

Ethical protocol (HREC-DCU 2024-063)

Supported by Dental Research Fund, Dental Research Project 3200502#41/2023, Faculty of Dentistry, Chulalongkorn University

Fluoride release-recharge ability and lactic acid neutralizing ability of fluoride-absorbed mesoporous silica in surface coating agents for provisional prostheses

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Objective This study aimed to compare the fluoride release-recharge abilities and lactic acid neutralization of surface coating agents that are filled with different fluoride-absorbed silica fillers synthesized from rice husk ash.

Materials and methods Two types of silica fillers were synthesized from rice husk ash with different techniques: calcination and chemical process. The silica particles were fluoridated in saturated sodium fluoride (NaF) solution. Surface coating material was incorporated with 1%, 2%, 3%, and 4% w/w for each type of silica filler. The coating agents filled with fluoride-absorbed mesoporous silica (FAMS) were applied to 3D-printed cylindrical resin specimens according to the instruction provided by the manufacturer (n=10 for each group). The resin cylinders glazed with the unfilled coating agent served as a control group. For fluoride-releasing ability, specimens were submerged in deionized water, and the fluoride concentration was evaluated every 72 hours for a total of 28 days. On day 9 and 18, 1.23% acidulated phosphate fluoride (APF) gel was applied to the specimens for fluoride recharging. For lactic acid neutralizing ability, the specimens were immersed in 0.0002M lactic acid and evaluated for pH changes after 24 hours. Pore volume and specific surface of the silica fillers were assessed with the multipoint Brunauer-Emmett-Teller technique (BET). The surface morphology of the fillers was inspected under a scanning electron microscope (SEM).

Results The fluoride release of the groups with higher filler loads (4% w/w) is likely to be higher than those of the group with lower filler loads. The groups filled with chemically synthesized silica filler may release higher amounts of fluoride ion due to higher porosity in comparison to those filled with calcined silica filler. All the groups except for the control group are expected to show acid neutralization ability.

Conclusion The porous silica particles synthesized from rice hull ash by chemical process and calcination may be considered as potential fillers for surface coating materials of provisional fixed restoration, as the particles demonstrated fluoride release-recharge ability and lactic acid neutralization.

Not applicable for Ethics

Supported by Dental Research Fund, Dental Research Project 3200502#42/2023, Faculty of Dentistry, Chulalongkorn University

Evaluating the accuracy of Large Language Models in the interpretation and analysis of periodontal chart

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Objective Large Language Models (LLMs) have demonstrated the capability to perform various tasks, including addressing dental queries. Nevertheless, to date, the utilisation of LLMs in interpreting dental records is yet limited. This investigation aims to evaluate and compare the precision of various LLMs in interpreting standard periodontal charts, utilising both pre-prompts and the absence thereof.

Materials and methods Five standard periodontal charts were created using an online tool (<https://www.periodontalchart-online.com/uk/>) and exported as JPG files. Each chart included key parameters such as probing depth, bleeding, and plaque score. Twenty clinical questions were designed to assess the models' ability to interpret the charts. Three LLMs—Claude Sonnet 3.5, ChatGPT 4.0, and Gemini Pro 1.5—were tested in five independent runs per question using two prompt strategies: a pre-prompt as a periodontal specialist and without a pre-prompt. Statistical analysis, including Kruskal-Wallis tests, was conducted using IBM SPSS version 29.0.2, with $p < 0.05$ as the threshold for significance.

Results Claude Sonnet 3.5 demonstrated the highest accuracy, achieving (70% with a pre-prompt, 65% without), followed by GPT-4o (48% and 45%) and Gemini Pro 1.5 (40% and 35%). Statistical analysis confirmed significant differences in performance between the models ($p < 0.05$). The inclusion of pre-prompts did not consistently enhance model performance.

Conclusion Claude Sonnet 3.5 achieves the highest accuracy in interpreting periodontal charts. However, the inconsistent impact of pre-prompts emphasises the need to improve LLMs for better application in clinical dental settings.

Not applicable for Ethics

Supported by Dental Research Fund, Dental Research Project 3200502#43//2023, Faculty of Dentistry, Chulalongkorn University

Chatbot for improving oral hygiene during orthodontic treatment: A pilot study

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Objective To develop and evaluate a chatbot for improving oral hygiene knowledge and self-care practices among orthodontic patients.

Materials and methods This study is a two-phase research project. Phase 1, currently underway, involves the development of a chatbot using AI algorithms and Gemini integrated with a Line Official Account (Line OA). The chatbot delivers interactive modules on brushing techniques, flossing, dietary recommendations, and problem-solving for common orthodontic issues. It also provides personalized feedback and appointment reminders. Phase 2 will consist of a randomized controlled pilot trial at the Orthodontic Clinic, Faculty of Dentistry, Chulalongkorn University. Participants will be randomized to either the chatbot intervention group or a control group receiving standard verbal instructions. The outcome will be the change in oral hygiene knowledge assessed by a questionnaire, patient satisfaction with the chatbot and plaque index scores.

Results As the chatbot is currently under development, results from the clinical trial are not yet available. A functional chatbot linked to Line OA has been created. This chatbot can provide information on oral hygiene topics relevant to orthodontic patients, such as brushing and flossing techniques, dietary advice, and managing common orthodontic. Formal evaluation of its efficacy will be conducted during the clinical trial phase. We anticipate that the chatbot group will demonstrate a statistically significant improvement in oral hygiene knowledge compared to the control group. We also expect high patient satisfaction scores with the chatbot's usability and content.

Conclusion This pilot study will develop chatbot which designed to provide personalized oral hygiene education and investigate the effectiveness of a chatbot-based intervention in enhancing oral hygiene knowledge and self-care practices among orthodontic patients. The findings will inform future development and implementation of chatbot technology in orthodontic care.

Ethical protocol (HRDC-DCU-P 2024-002)

Supported by Dental Research Fund, Dental Research Project 3200502#44/2024, Faculty of Dentistry, Chulalongkorn University

19th February 2024

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Development of GO/Ag-Cu NPs surface coating on NiTi alloy for biomedical applicationsKittikun R*, Srimaneepong V¹¹Department of Prosthodontics, Faculty of Dentistry, Chulalongkorn University

Objective To develop GO/Ag-CuNPs surface modification on NiTi alloys by electrophoretic deposition.

Materials and methods The preparation of Graphene Oxide (GO) solution, NiTi substrates, and the coating procedure followed the methodology described in the previous study.^[1] Three different concentrations of copper nitrate (0.05 M, 0.1 M, and 0.2 M) were combined with a GO solution, silver nitrate (AgNO₃), and trisodium citrate (Na₃C₆H₅O₇) as a stabilizing agent. Medical-grade NiTi alloy plates were polished to a uniform surface roughness using silicon carbide paper, followed by sequential ultrasonic cleaning in acetone, ethanol, and deionized water. Electrophoretic deposition (EPD) was performed, with the NiTi plates acting as the anode and platinum as the cathode, using a constant voltage. After deposition, the samples were dried, and the resulting coatings were characterized by Scanning Electron Microscopy (SEM), Raman spectroscopy, and Energy Dispersive X-ray Spectroscopy (EDS) to examine the microstructure and elemental composition.

Results Raman spectroscopy analysis revealed different deposition patterns based on the Cu(NO₃)₂ concentration. When using 0.05 M Cu(NO₃)₂, neither silver nor copper was detected on the surfaces. However, both silver and copper deposits were found on samples treated with 0.1 M and 0.2 M Cu(NO₃)₂, with the 0.2 M sample showing a higher copper weight percentage than the 0.1 M sample.

Conclusion For successful silver/copper deposition on NiTi alloy surfaces using this electrophoretic deposition, at least 0.1 M of copper nitrate concentration is required. Concentration below this threshold failed to produce copper deposits on the alloy surface.

Not applicable for Ethics

Supported by Dental Research Fund, Dental Research Project 3200502#45/2024, Faculty of Dentistry, Chulalongkorn University

An investigation into the usability testing of artificial intelligence-assisted assessment in evaluating the difficulty level of impacted mandibular third molar extractions

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Objective To evaluate the accuracy of three-phase computer-aided visualization–based DL system (AI algorithm) in determining the difficulty level of impacted lower third molar extractions by compare its performance with three groups of human evaluators include undergraduate dental students, post-graduate dental students, and oral and maxillofacial specialists.

Materials and methods The study involved 15 human participants divided into three groups (n=5 per group): undergraduate dental students, postgraduate dental students, and oral and maxillofacial specialists. Each clinician will independently assess and label the panoramic image of each third molar as each characteristics including angulation, depth, ramus relationship, and level of difficulty. Survey questionnaire based on the Pederson difficulty index. AI models trained on annotated panoramic radiographs use ResNet for classification, RetinaNet for localization, and ViT for difficulty assessment of impacted LM3s. This study will compare the accuracy in assessing the difficulty of third molar extraction across groups of undergraduate (UG), postgraduate (PG), and board-certified oral and maxillofacial surgery specialists (Spec). Additionally, assess the accuracy in assessing the difficulty of third molar extraction of UG in comparison to AI, PG in comparison to AI, and Spec in comparison to AI. Finally, evaluate the accuracy in assessing the difficulty of third molar extraction of AI-enabled UG in relation to PG and in relation to Spec.

Results The AI system is expected to demonstrate comparable accuracy to the oral and maxillofacial specialists, with both outperforming undergraduate and postgraduate dental students. AI is anticipated to significantly enhance the diagnostic accuracy of UG, bringing it closer to Spec levels, and enhance decision confidence for Spec, showcasing its potential as an educational and decision-support tool.

Conclusion AI-assisted evaluation offers a reliable and consistent method for determining the difficulty level of impacted mandibular third molar extractions, performing on par with oral and maxillofacial specialists. The integration of AI significantly boosts the accuracy of UG, allowing them to perform comparably to Spec. These findings highlight the potential of AI as a supplementary tool to support clinical decision-making and education in dental practice. Further research with larger sample sizes is recommended to validate these results.

Under Ethical Consideration

Supported by Dental Research Fund, Dental Research Project 3200502#46/2023, Faculty of Dentistry, Chulalongkorn University

19th February 2024

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An exploratory analysis of artificial intelligence-based evaluation systems for assessing the difficulty level of impacted lower third molar extractions

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Background The extraction of impacted mandibular third molars is a common surgical procedure that can present varying levels of difficulty. Accurate preoperative assessment of the difficulty associated with these extractions is essential for optimal treatment planning. Recent advancements in artificial intelligence (AI), particularly deep learning models like YOLO (You Only Look Once), have shown promise in automating the detection and classification of dental features from radiographic images. This study aims to utilize YOLOv10 to detect and classify the difficulty of impacted mandibular third molar extraction using panoramic radiographs.

Materials and methods A dataset comprising 1,000 panoramic radiographs was curated and labeled by three oral and maxillofacial surgery (OMFS) specialists, focusing on various indicators of extraction difficulty from the Oral and Maxillofacial Surgery department of the Faculty of Dentistry at Chulalongkorn University. The YOLOv10 model was trained on this labeled dataset, employing techniques such as data augmentation to enhance model robustness. Performance metrics, including accuracy, AUC curve, and F1 score, were computed to evaluate the model's effectiveness in detecting and classifying the extraction difficulty.

Expected Results and Conclusion The expected result and conclusion is that the newly developed model can detect and classify the difficulty level of the impacted lower third molar extraction from patient's panoramic radiograph with high accuracy and could surpass the previously developed model.

Ethical protocol (HREC-DCU 2022-116)

Supported by Dental Research Fund, Dental Research Project 3200502#47/2023, Faculty of Dentistry, Chulalongkorn University

PP-37

Effect of eugenol-based material and surface treatment on microtensile bond strength of universal adhesive to deep dentin under simulated pulpal pressure

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Objective This study evaluated the effects of ethanol surface treatment and adhesive modes on the microtensile bond strength (μ TBS) of universal adhesive to zinc oxide eugenol (ZOE)-contaminated deep dentin under simulated pulpal pressure.

Materials and methods Sixty-four extracted human molars were divided into eight experimental groups based on ZOE restorations, ethanol surface treatments (with: Et1 and without: Et0), and adhesive modes (etch-and-rinse:ER and self-etch:SR). The contamination with ZOE (IRM, Dentsply Sirona.) was created by placing ZOE on the dentin surface and stored in 37°C distilled water for 72 hours. For group Et1, 70% ethanol was agitated on the surface for 30 seconds before adhesive procedures. A universal adhesive system (Tetric N Bond Universal, Ivoclar, Liechtenstein) was applied categorizing into two modes following the manufacturer instructions under simulated pulpal pressure and restored with bulk-fill resin composite (Ivoclar Vivadent Tetric N Ceram Bulk Fill, Liechtenstein). The immediate μ TBS test was performed. Failure modes were evaluated under a scanning electron microscope at 5000x magnification. The data were compared by using one-way ANOVA and Tukey's post hoc test. Three-way ANOVA was used to analyze the effect of ethanol, IRM restoration, and adhesive modes. P-value less than 0.05 was considered statistically significant.

Results ZOE significantly lowered the μ TBS only in the SE groups ($p < 0.001$), whereas, after ZOE restoration in SE mode, ethanol surface treatment greatly improved the bond strength ($p < 0.001$). In contrast, the bond strength values were comparable in ER groups with and without ethanol after IRM restoration ($p > 0.05$). However, there was no significant difference between the two adhesive modes within the same surface treatments except using ethanol after ZOE restoration ($p < 0.05$).

Conclusion Ethanol surface treatment after ZOE restoration significantly improves the μ TBS of universal adhesive in self-etch mode to deep dentin under simulated pulpal pressure, while etch-and-rinse mode was not affected by ZOE contamination.

Ethical Protocol (HRDC-DCU 2024-071)

Supported by Dental Research Fund, Dental Research Project 3200502#27/2023, Faculty of Dentistry, Chulalongkorn University

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