



**International
Seminar of
Science and
Applied Technology**

POLBAN 2025 POSTER EXHIBITION

POSTER GUIDELINES

<https://issat.polban.ac.id/2025/>

“Green Technology and AI-Driven Innovations in Sustainability Development and Environmental Conservation”

15 October 2025, Politeknik Negeri Bandung

Poster Submission Deadline

1 October 2025

<https://bit.ly/issat-poster-2025>



Poster Contents Requirements

INTRODUCTION

Research background and benefit

METHODS

Data and Process

RESULT AND DISCUSSION

Show the products, advantages, and constrains research.

CONCLUSION

Research conclusion and potential for next research.

ACKNOWLEDGEMENT

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REFERENCE





Poster Requirements

SIZE

Posters are made in A1 size

FILE FORMAT

Files are uploaded in pdf format

LANGUAGE


Poster content is in English

LAYOUT AND DESIGN

Portrait layout with a neat and attractive design

LOGO

Include the ISSAT logo on the poster, can be downloaded at
<https://bit.ly/logo-issat>



Poster Example

Enhancing hand hygiene practice in the Post Anaesthetic Care Unit (PACU) 2018

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³Post Anaesthetic Care Unit, Fiona Stanley Hospital

Fiona Stanley Hospital

Progressive Attitudes & Commitment in Understanding the importance of hand hygiene in PACU

For all the lives we touch, hand hygiene is at the heart of care

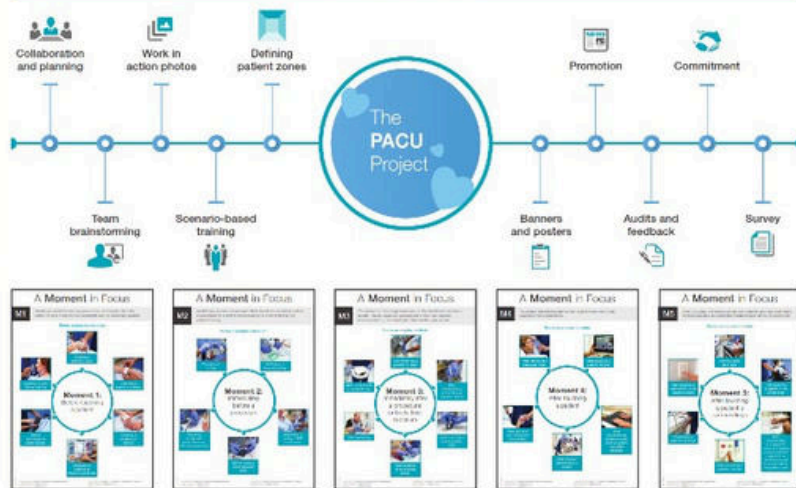
Introduction

- Post Anaesthetic Care Unit (PACU) clinical audits showed compliance with the '4 Moments' of Moments for Hand Hygiene' was at 59% in period 3, 2017
- The National benchmark for hand hygiene compliance is 80%
- The low compliance rate signified potential risks of cross-contamination and exposure of pathogens between patients, staff and clinical environment
- A collaborative approach to improve compliance formed between Education and Infection Prevention and Management

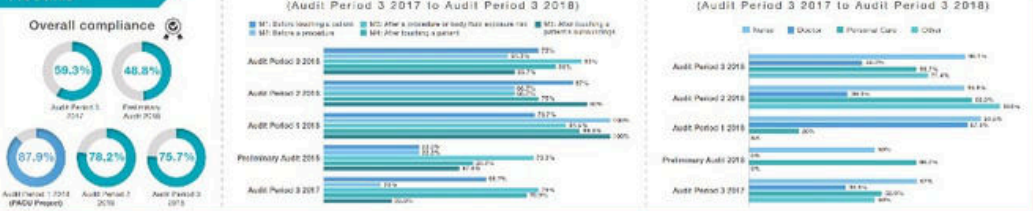
Objectives

- Understand the barriers in PACU
- Share knowledge and facilitate multidisciplinary discussions
- Identify motivations and strategies for improvement
- Motivate staff to pursue excellence
- Establish a simulated learning environment
- Create a collaborative respectful space
- Seek commitment from staff to sustain practice

Methodology



Results



Conclusion

- Enhanced communication and collegial support has created an environment where staff are comfortable to advocate for their patients, share their knowledge and promote patient and staff safety. Continued scenario-based training will ensure sustainability of the Hand Hygiene Project
- Using a range of evidence-based knowledge translation techniques engages staff and achieves practice change

Recommendations

- Create a video to show hand hygiene in practice in open-planned areas
- Create a template of this activity to enable ease of replication in other areas
- Continue scenario-based hand hygiene education
- Develop collaborative projects around workflow and clinical workflow
- Don't be shy to use creativity and humour in presentation of subject matter to establish engagement and participation

Locally Inhibition Of Orthodontic Relapse by Injection Of Carbonate Apatite-advanced Platelet-rich Fibrin In Rabbit

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Introduction

Relapse is considered a significant failure after orthodontic treatment. Stimulation of bone formation and inhibition of resorption is believed could effectively prevent the relapse [1]. In response to relapse, receptor activator of nuclear factor- κ B ligand (RANKL) expressions will increase, while osteoprotegerin (OPG) will decrease [2]. Carbonated hydroxyapatite (CHA) is an ideal processing candidate for enhancing bone remodeling, since it potential to raise the concentration of Ca²⁺ & PO₄³⁻ ions [3]. Meanwhile, advanced platelet-rich fibrin (aPRF) contains high levels of growth factors that play a central role in bone remodeling and expected to have the ability to prevent relapse [4]. This research was intended to investigate the effect of hydrogel CHA-aPRF in preventing orthodontics relapse.

Experimental

Preparation of hydrogel CHA-aPRF. The functional group formation of CHA were determined by FTIR (Thermo Scientific Nicolet S10, USA). To observe the degradation profile, the hydrogel supernatant was analyzed by UV-Vis spectrophotometer (Shimadzu, Japan). PRF was prepared briefly from 10 ml of rabbit blood. Then, the protocols were done in two methods, immediately centrifuged with a 1500 rpm, 14 min for aPRF and 2700 rpm, 12 min for sPRF. Clot was then pressed with a PRF processing box for 10 min to squeeze the fibrin out. The releasate with highest platelets were then loaded into CHA, by dropping 200 μ l PRF releasate onto 10 mg of CHA, and incubated for 1 h at 37°C (Fig. 1).



FIGURE 1. Material preparation: (a) hydrogel CHA preparation using physically cross-linked technique. (b) Relasate from surgical site of the rabbit's ear using needle. (c) 25 pieces of CHA-aPRF. (d) CHA-aPRF components were produced where the intermediate fraction composed of dense fibrin network, plasma layer and red blood corpuscle layer at the bottom using sterile tweezers. (e) CHA-aPRF, then pressed with a PRF processing box. (f) CHA-aPRF incorporation.

Animal experiments. 45 New Zealand rabbits lower incisors were moved distally with an orthodontic force of 50 cN (Fig. 2). The subjects were grouped into Group A (control), Group B (CHA), and Group C (CHA-aPRF). After 1 weeks, the distance was maintained. CHA and CHA-aPRF were then given every 7 days (Fig. 2a). The brackets were then debonded. GCE was taken every 7 days (Fig. 2b). The RANKL and OPG expressions were measured by ELISA methods (Fig. 2c). Relapse stages followed by CHA and CHA-aPRF intraoral injection on the mesial (compressive side of relapse movement) and distal (tension side).

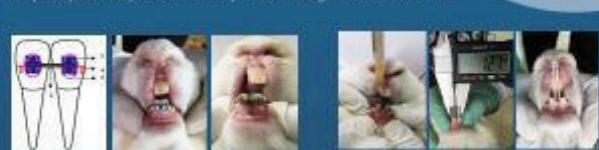


FIGURE 2. Design of the experimental tooth movement model: (a) Design of the experimental tooth movement model. (b) Design of the experimental tooth movement model. (c) Design of the experimental tooth movement model.

FIGURE 3. (a) Intraoral injection of CHA-aPRF (0.5 ml) into the tissue could accept without reaction. (b) The distance between the lower incisors was measured from the mesial tip of left and right lower incisor by using an electronic digital caliper during the relapse movement for 0, 3, 7, 14, and 21 days after debonding. (c) Intraoral injection of CHA-aPRF intraoral injection on the mesial (compressive side of relapse movement) and distal (tension side).

FIGURE 4. (a) Mean percentage (standard deviation) relapse among 3 groups tested. Significant differences are noted by *p < 0.05. (b) Clinical appearance of relapse movement between 3 groups tested, immediately after debonding (upper) and 21 days following debonding (lower).

FIGURE 5. Comparison of RANKL and OPG expression among 3 groups tested. Significant differences are noted by *p < 0.05.

FIGURE 6. Comparison of RANKL and OPG expression among 3 groups tested. Significant differences are noted by *p < 0.05.

FIGURE 7. (a) Mean percentage (standard deviation) relapse among 3 groups tested. Significant differences are noted by *p < 0.05. (b) Clinical appearance of relapse movement between 3 groups tested, immediately after debonding (upper) and 21 days following debonding (lower).

FIGURE 8. Comparison of RANKL and OPG expression among 3 groups tested. Significant differences are noted by *p < 0.05.

FIGURE 9. Comparison of RANKL and OPG expression among 3 groups tested. Significant differences are noted by *p < 0.05.

FIGURE 10. Comparison of RANKL and OPG expression among 3 groups tested. Significant differences are noted by *p < 0.05.

FIGURE 11. Comparison of RANKL and OPG expression among 3 groups tested. Significant differences are noted by *p < 0.05.

Results

The FT-IR analysis showed that CHA was successfully synthesized and developed, indicated by absorption at 1451, 1456 cm⁻¹ from ν_3 vibration, and also 875 cm⁻¹ from ν_2 vibration of ion CO₃²⁻ (Fig. 4). It was also known, degradation profile of 30-CHA was considered total compared to others (Fig. 5a). The platelet count showed that aPRF has highest platelet counts (4.78-fold than whole blood) compared to others (Fig. 5b). It has been found that expressions of RANKL were significantly lowest (p < 0.05) in groups C on day 0, 3, and 7, while OPG expressions showed significantly highest (p < 0.05) in groups C on day 14 and 21 (Fig. 6). They also showed a trend toward an increase in relapse distance, while group C showed lowest percentage of relapse distance (29.95 \pm 3.91%) compared to others. (Fig. 7)

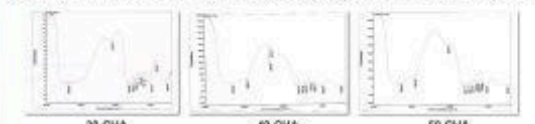


FIGURE 4. The FT-IR spectra of the microphases used in this study. Higher transmission of PO42- and CO32- was confirmed in 30-CHA group.



FIGURE 5. (a) Degradation profile of gelatin-CHA. (b) Platelet count of three groups tested: advanced-PRF, standard PRF, and whole blood.

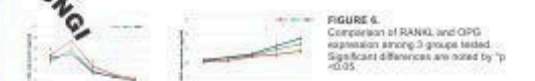


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FIGURE 29. Comparison of RANKL and OPG expression among 3 groups tested. Significant differences are noted by *p < 0.05.

FIGURE 30. Comparison of RANKL and OPG expression among 3 groups tested. Significant differences are noted by *p < 0.05.

Smart Agriculture Framework and Its Implementation to Open-field Tropical Horticulture Production*

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Smart Agriculture Framework and Its Implementation to Open-field Tropical Horticulture Production*

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INTRODUCTION

Open-field tropical horticulture production is highly affected by the uncontrollable environmental condition. To deal with it, farmers manage their farm so as to adapt the environment. The farming management, such as crops selection, planting schedule, and plant maintenance, generally decided by farmers according to their personal knowledge, gained from the experience of farming in the preceding years.

Nowadays, climate change intensifies unpredictable weather and unstable distribution. Consequently, the farming management considering the climate change should be taken into account.

The objective of this study was to introduce a **smart agriculture framework**, implementing a **cloud technology**, **data science**, and **precision agriculture approach** to improving conventional farming management in open-field tropical horticulture production.

SYSTEM DESCRIPTION

Environmental Monitoring

Environmental monitoring is the foundation of modern agriculture. Fig. 1 shows the system architecture of developed remote environmental monitoring and control framework (Nugroho, 2016).

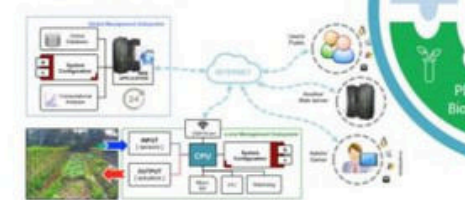


Fig. 1. System architecture of remote environmental monitoring and control framework



Fig. 2. Web interface for node management and environmental monitoring

CONCLUDING REMARKS

- Implementation of Precision Agriculture (PA) in open-field tropical horticulture requires big effort to realize. A monitoring/control framework having flexibility and robust performance is necessary.
- The use of cloud computing technology could provide a reliable access and flexible computation of collected environmental data.
- Knowledge and understanding about evapotranspiration might bring a better farming management and wise selection of appropriate application. Environmental control can be applied wisely according to the scenarios.
- Plant monitoring and assessment based on computer vision, adopted Optical Flow method as leaf motion tracking, could be used to quantify the circadian rhythm of mature plant foliage.

Environmental Assessment

Reference evapotranspiration (E_{tr}) is the evapotranspiration from reference surface that has used to estimate water loss from an open-field cultivation surface. The real-time E_{tr} monitoring and automatic detection of extreme E_{tr} have been developed for rapid environmental assessment.

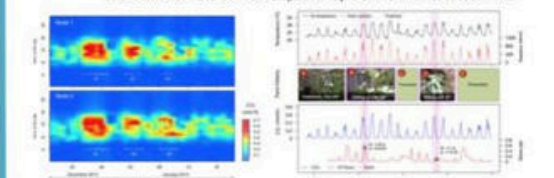


Fig. 3. Distribution of E_{tr} (Left), Air temperature and solar radiation (R_{top}), recorded activity (R_{mid}), real-time E_{tr} monitoring and its automatic change point detection.

Environmental Control

Irrigation control is one of the applications that can be improved by the utilization of environmental monitoring and assessment. Both automatic and scheduling irrigation can be performed in a precision manner by setting the set point target and irrigation scenario.

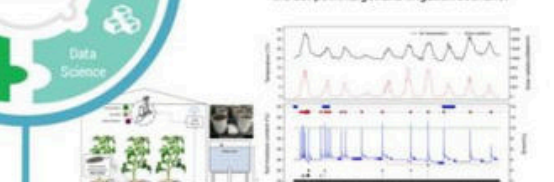


Fig. 4. Experiment setup of irrigation control (Left), Environmental monitoring data (Right, top), and performance of soil moisture content control with minimum set point.

Plant Monitoring & Assessment

A plant monitoring and assessment module based on computer vision techniques have developed. Plant motion and direction angle have been used to quantify the circadian rhythm and its relation to the environment.

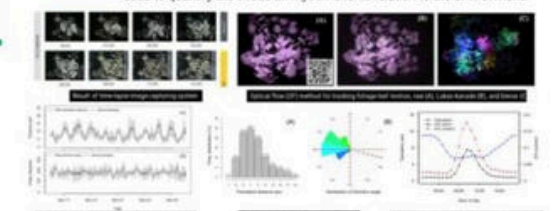


Fig. 5. Plant monitoring and assessment module based on computer vision techniques.

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Timeline



Submission
18/08/2025 - 1/10/2025



Review
22/09/2025 - 6/10/2025



Announcement
7/10/2025



Exhibition
15/10/2025