

FLAXSEED EXTRACT PROMOTES HUMAN OSTEOBLAST-LIKE CELL PROLIFERATION IN BONE WOUND-HEALING MODEL (IN-VITRO)

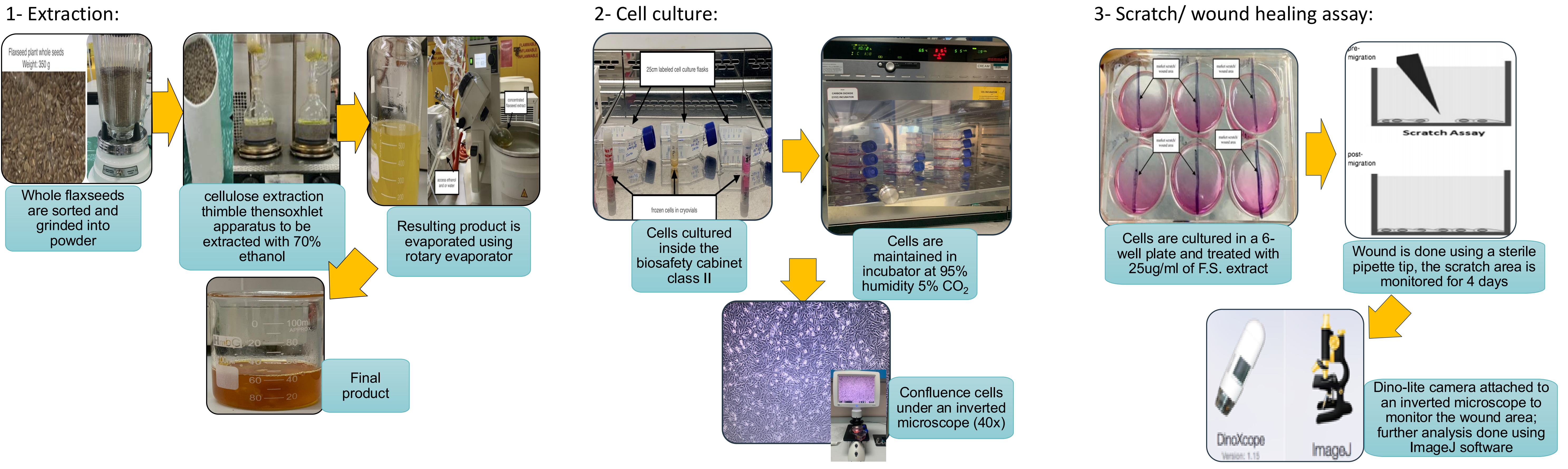
Sama Naziyah Shaban¹, Khairani Idah binti Mokhtar², Basma Ezzat Mustafa Alahmad², Solachuddin Jauhari Arief Ichwan³

¹Faculty of Dentistry, Qaiwan International University, Iraq ²Faculty of Dentistry, International Islamic University Malaysia, Malaysia, ³Institute of Health Sciences, University Brunei Darussalam, Brunei

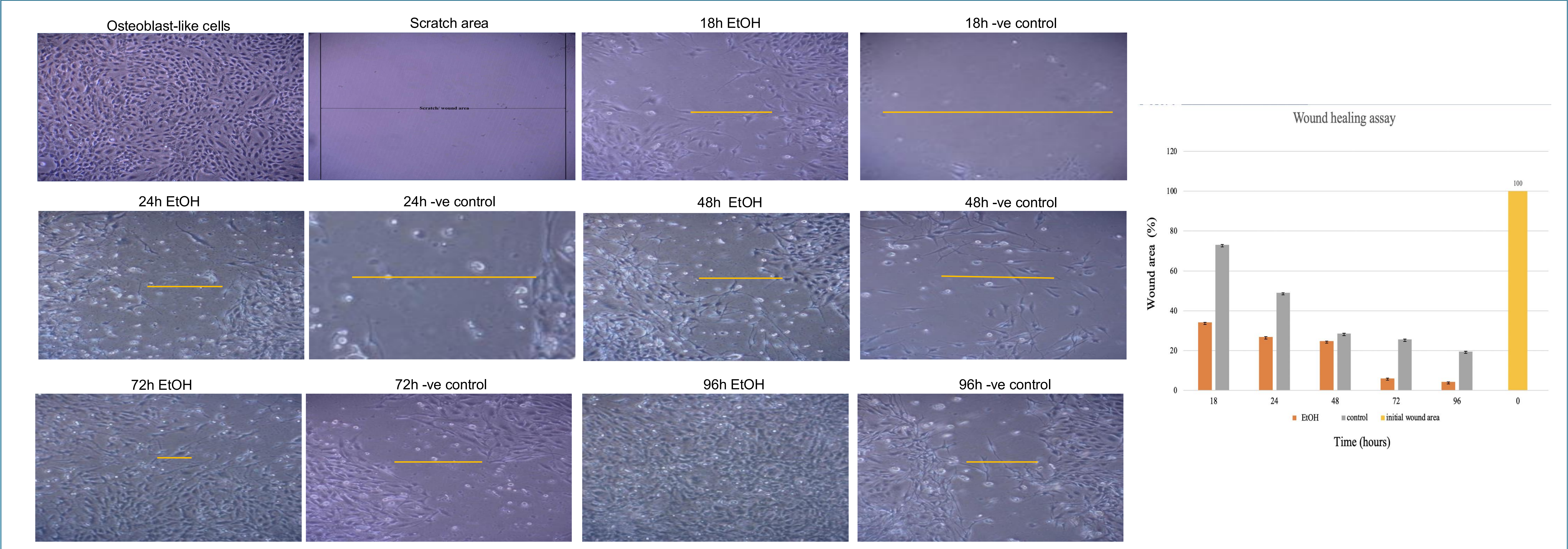
Introduction

Flaxseed (*linum usitatissimum*); is a plant with many health promoting properties such as anti-cancer, anti-fungal, and anti-microbial, hence, recognized as a “super food”. As for wound healing properties, flaxseed is proven to promote the healing of skin wounds in both *in-vitro* and *in-vivo* study models. Osteoblast-like cell line which has been widely utilized in studies focusing on bone cell development including bone wound-healing. Flaxseed’s impact on bone wound healing is less studied. This research investigates the effect of ethanolic flaxseed extract on osteoblast-like cells in an in-vitro bone wound-healing model.

Materials & Methods



Results



Discussion

Flaxseed (*Linum usitatissimum*) was extracted using the Soxhlet method, which efficiently isolates key bioactive compounds like fatty acids and sesquiterpenoids—both known to support flaxseed’s healing properties (Shaban et al., 2020). Flaxseed extract have induced cell viability when tested on few cell lines like stem cells and human oral fibroblast cell lines (Nur Sazwi et al., 2018; Shaban et al., 2020). The wound healing assay showed that flaxseed extract effectively promoted healing in osteoblast-like cells, with noticeable improvement as early as 18 hours after treatment. By 72 hours, the treated cells fully closed the wound area, unlike the untreated control, where the wound remained uncovered even after 96 hours. These findings highlight the significant healing potential of flaxseed extract, especially when compared to natural healing without treatment, suggesting its ability to accelerate bone healing in vitro (Hussein et al., 2019). Flaxseed has been shown to enhance bone density when used as a supplement for treating osteoporosis (Shubhashree et al., 2018), which supports its potential role in promoting bone healing.

Conclusion

Linum usitatissimum extract exhibits wound-healing effects on human osteoblast-like cells, indicating its strong potential for treating deep wounds, particularly those involving bone tissue.

Acknowledgment

This research was funded with special grant (ID: SP17-026- 0288), and Research Management Center IIUM grant (ID: RMCG20-060-0060).

References

Shaban, S. N., Mokhtar, K. I., Ichwan, S. J. A., Ashour, A. E. A., & Alahmad, B. E. M. (2020). Flaxseed (*Linum usitatissimum*) Extract Activity on Human Oral Fibroblasts (HOF) Cell Line. *Annals of Dentistry University of Malaya*, 27, 50-54.

Nur Sazwi Nordin, Khairani Idah Mokhtar, Muhammad Lokman Md Isa, Syed Zahir Idid, Widya Lestari, Basma Ezzat Mustafa, Solachuddin Jauhari Arief Ichwan, Deny Susanti Darnis, Azlina Ahmad, Thirumulu Ponnuraj Kannan (2018). *Journal of International Dental and Medical Research*, 11(2), 643-649.

Hussein, K. H., Abdelhamid, H. N., Zou, X., & Woo, H. M. (2019). Ultrasonicated graphene oxide enhances bone and skin wound regeneration. *Materials Science and Engineering: C*, 94, 484-492.

Shubhashree, M. N., Naik, R., Doddamani, S. H., & Bhat, S. (2018). An updated review of single herbal drugs in the management of osteoporosis. *Int J Complement Altern Med*, 11, 82-86.