

BRIDGING ACADEMIA
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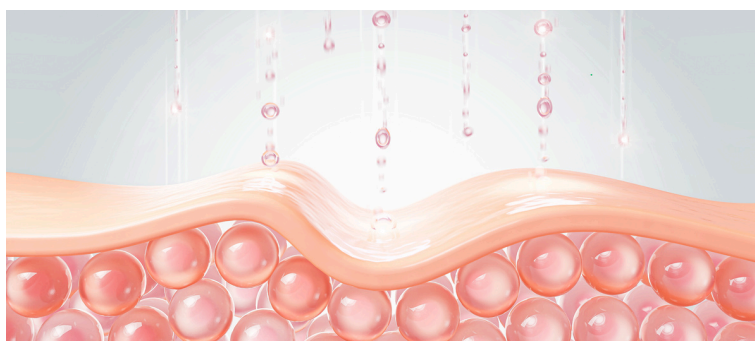
PIONEERING THE NEXT GENERATION OF ANTI-AGING SERUMS

By Assoc. Prof. Dr. Meor Mohd Redzuan B Meor Mohd Affandi

Astaxanthin, a naturally occurring carotenoid synthesized by the microalgae *Haematococcus pluvialis*, exhibits potent antioxidant capacity. In dermatological applications, it functions as a biological photoprotectant, mitigating UV-induced damage, reducing wrinkle formation, and enhancing skin elasticity. Comparative analyses demonstrate that its antioxidant efficacy surpasses that of β -carotene and vitamin E by 40-fold and 1,000-fold, respectively. However, the clinical translation of natural astaxanthin faces significant pharmacokinetic limitations. Its highly lipophilic structure restricts oral bioavailability and limits transdermal permeation. Additionally, the high cost of natural astaxanthin extraction has led to a market saturated with synthetic alternatives, which lack the requisite safety and efficacy profiles for human topical use.



"Formulating natural astaxanthin into an emulsion with nanosized globules can significantly enhance dermal absorption by up to 100%."



Overcoming Formulation Barriers

To address these delivery challenges, our research team at the Department of Pharmaceutical Technology, Faculty of Pharmacy, UiTM Puncak Alam, developed an optimised topical delivery system. By employing lipid- and surfactant-based nanoemulsions, we successfully stabilized astaxanthin within droplets ranging from 20 to 400 nm. The integration of specific emulsifiers effectively lowers the interfacial tension of astaxanthin, thereby maximizing its surface area and enhancing percutaneous absorption without inducing dermal toxicity.

A Decade-Long Translational Research Partnership: UiTM x MBH Cosmeceutical

The development of the Living Jungle Astaxanthin Serum marks a significant milestone in an ongoing, 10-year collaboration between UiTM and MBH Cosmeceutical Sdn. Bhd. This partnership successfully bridges the gap between academic research and commercial manufacturing capabilities. Over the past decade, our joint efforts have focused on extensive product development and rigorous quality control (QC) protocols. By integrating UiTM's expertise in pharmaceutical formulation with MBH's industrial manufacturing standards, we have established a reproducible pipeline for translating laboratory prototypes into safe, clinical-grade skincare therapeutics.

Supported by the Industry Matching Grant Program (IMaP) under the Ministry of Higher Education (KPT) and MBH Cosmeceutical Sdn. Bhd., this project facilitated the industrial scale-up of our nanoemulsion prototype. Subsequent 4-week biophysical evaluations yielded statistically significant outcomes. The formulated serum substantially reduced transepidermal water loss (TEWL) and increased stratum corneum hydration, indicating improved skin barrier function. Furthermore, Cutometer assessments confirmed a measurable increase in skin elasticity, validating its anti-aging efficacy.

Socioeconomic and Industrial Impact

The outcomes of this research extend beyond academic metrics. Clinically, it provides consumers with a safe, validated, and naturally derived intervention against photoaging, addressing the gap left by unverified synthetic products. Industrially, this project de-risks the R&D process for the local cosmetic sector, enabling the production of a high-value, scientifically backed formulation capable of competing in the global market. For UiTM, it underscores the faculty's capacity for translational research and intellectual property generation. Ultimately, this academic-industry alignment fulfils the core objectives of the IMaP grant, contributing directly to Malaysia's transition towards a Knowledge-Based Economy (K-Economy).

Regulatory Approval and Commercialisation

The final formulation has secured regulatory notification from the National Pharmaceutical Regulatory Agency (NPRA), and intellectual property protection is underway via a Utility Innovation filing. Having demonstrated sustained microbiological and physicochemical stability over a rigorous 2-year testing period, the *Living Jungle Astaxanthin Serum* is scheduled for commercial launch in September 2026.

ABOUT THE AUTHORS

Dr Meor is an Associate Professor and Project Leader at the Faculty of Pharmacy, Universiti Teknologi MARA (UiTM), Puncak Alam Campus. He holds a PhD in Pharmaceutical Technology, with primary research interests in drug development and delivery systems, materials science, nanotechnology, and advanced cosmetic formulations. With an extensive record of peer-reviewed publications, Dr. Meor actively translates academic research into industrial applications. He currently serves as the Principal Investigator for the Ministry of Higher Education-funded IMaP grant, focusing on the development of novel topical anti-aging formulations.



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MR FOO CHIT SEONG

Mr Foo is the Operations Director and owner of MBH Cosmeceutical Sdn. Bhd., bringing over 20 years of operational and technical expertise to the cosmetic and pharmaceutical industry. He holds an MSc in Pharmaceutical Technology from King's College London and a BSc (Hons) in Pharmacy from the University of Sunderland. As a registered pharmacist in both Malaysia and Great Britain, Mr Foo's extensive career spans Good Manufacturing Practice (GMP) compliance, industrial formulation scale-up, and global regulatory affairs. Under his leadership, MBH Cosmeceutical has successfully partnered with academic institutions like UiTM to translate advanced scientific research into premium, commercially viable skincare solutions.