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PRESCRIPTION

Latest news and updates from the Faculty of Pharmacy

COGNITIVE FRAILTY AND THE AGING GUT

**LONG TERM RESEARCH GRANT SCHEME (LRGS)
MINISTRY OF HIGHER EDUCATION (MOHE)**

BY: PROFESSOR DATO' DR. ABU BAKAR ABDUL MAJEED, PROFESSOR DR. KALAVATHY RAMASAMY & AP DR LIM SIONG MENG

The Faculty of Pharmacy, UiTM is proud to be part of the Transforming Cognitive Frailty into Later-Life Self-Sufficiency (AGELESS) research program that was funded by the Ministry of Higher Education under the LRGS (2019-2025). The entire AGELESS research programme led by Professor Dr. Tan Maw Pin from the University of Malaya (UM) comprised of 5 key projects and involved 50 co-investigators from seven universities (public and private) in Malaysia. Professor Dato' Dr. Abu Bakar Abdul Majeed had the privilege to lead Project 3 which featured "Decoding Phenome to Unravel the Mechanisms of Cognitive Frailty".

DIETARY & SUPPLEMENTARY INTERVENTIONS



MICROORGANISM



EXERCISE & FASTING



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The rationale of Project 3 was based on the fact that Malaysia is set to become an aged nation sooner than anticipated, with projections indicating that over 17% of its population will be 60 years or older by 2040. The increase in older populations coincides with a rise in unhealthy ageing and age-related illnesses. A critical marker of unhealthy ageing is cognitive frailty (CF), a syndrome with simultaneous presence of cognitive impairment and physical frailty. These two domains may worsen each other's effects on the overall health and functioning. Unlike irreversible conditions such as dementia, CF represents a potentially reversible state when identified and addressed early. It is postulated that ageing is characterised by a frail gut with presentations of low-grade chronic inflammation, immunosenescence, and dysbiosis, all of which may damage brain function, predisposing to CF. As such the first study aimed at elucidating the changes of gut microbiota and short-chain fatty acid (SCFA) in CF, mild cognitive impairment (MCI), physical frailty (FRAIL), and robust (ROBUST) subjects. The second study evaluated the impact of non-pharmacological interventions in CF subjects. Our findings indicated that the gut microbial diversity was significantly ($P < 0.05$) reduced in cognitive decline groups (MCI and CF) but preserved in the physical frailty group. Distinct gut microbiota shifts and depletion of faecal short-chain fatty acids (SCFA) were confined to cognitive impairment subjects. It appears that microbiota alterations and their metabolic outputs are more closely tied to cognitive decline than to musculoskeletal deterioration. The non-pharmacological interventions yielded significant ($P < 0.05$) positive impact on physical and cognitive performances as well as anthropometric parameters of CF subjects. Gut microbiota composition, faecal SCFA and plasma inflammatory markers were found to be improved in the intervention group when compared to the control counterpart. Owing to the adaptive and plastic nature of gut microbiota, our results suggest the potential of non-pharmacological interventions in promoting healthy ageing, highlighting the gut-muscle-brain axis as a key pathway that mediates health benefits.

Part of our published study (Archives of Gerontology and Geriatrics, Volume 128, 2025) was featured in the Memorable World Life YouTube Channel





‘PRINCIPLE’ INVESTIGATOR (UITM)
Professor Dato’ Dr. Abu Bakar Abdul Majeed

CO-RESEARCHERS

