

Microbiome Research: Molecular characterization, virulence determinants and antibiotic resistance mediation of *Vibrio* species: an emerging trend detected in seafood

About the Research Project:

The project collaborates with US-FDA to investigate foodborne pathogens isolated from seafood in Malaysia. The project will investigate the molecular profiles, virulence determinants and antibiotic resistance mediation of *Vibrio* species detected in seafood.

Project Description:

The intense aquaculture sector has resulted in marine animals to be vulnerable to bacterial infections and often demands the use of antibiotics. Antibiotics are applied to promote growth as well as treat and prevent diseases. As a result, the community wellbeing and food safety is lurked by the emergence of antibiotic resistant bacteria e.g. *Vibrio* sp. The threat of infections by *Vibrio* sp. from seafood that have developed resistance has increased greatly in the recent years. Unfortunately, aquaculture production surrounding, and systems has led to antibiotic residue to build up in the culturing sites and adjacent waters, marine animals, plankton and sediments. Hence, continuous surveillance is needed to control the increasing antibiotic resistance traits in the environment and employ proper management method effectively. Researchers observed seafood such as shrimp, cockles, clams, and fish are the primary route of transmission of antibiotic-resistant bacteria between animal and human. This study aims to detect *Vibrio* sp. in seafood by microbiological method e.g. selective media, investigate the antibiotic resistance profiles, and determine the antibiotic resistance mediation via plasmid profiling, plasmid curing and next generation sequencing. The study's outcome could contribute significantly in the management and surveillance of bacteria in the aquaculture surroundings, as well as to the Malaysia National Key Economic Areas (NKEA) - EPP2 Clinical Research and EPP3 Pharmaceuticals. These two important components of NKEA Healthcare has supported research to improve the quality of Malaysia healthcare system.

Supervisory Team

PhD Main Supervisor: Assoc Prof Dr Lee Learn Han

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PhD Co-Supervisor: Dr Vengadesh Letchumanan

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Eligibility:

Candidates must meet the minimum admission requirements (for academic and English language proficiency) to be offered admission in the PhD degree. For consideration of scholarship, candidates must possess academic standing equivalent to a high distinction

average (H1 or First Class Honours) from a recognised university. Selection for a scholarship will be based on comprehensive ranking of academic achievement, research publications, and research experience or research-related awards as determined by Monash University Malaysia.

Required Skills:

- Experience in molecular biology and microbiology lab skills
- Experience in handling next generation sequencing data
- Hardworking, keen, and willing to learn
- Passionate in scientific investigation
- Ability to work well with team member

Academic Background:

Education in Medical Science, Biomedical Science, Biotechnology, Molecular Biology, Microbiology and Health Sciences

Source of Funding:

US-FDA International Collaboration, National Industry Grant