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Utilizing essential oils for mitigation of AMR

Antibiotics have revolutionized medicine in the treatment against pathogenic microbes. However, their extensive uses in agriculture and aquaculture have resulted in the increase of antibiotic resistant pathogens, posing a threat to public health. It is now imperative to look into alternative antibacterial drugs. Natural products such as essential oils have been previously studied for their potential use as therapeutic agents against multidrug resistant infections. However, essential oils, despite proven to be efficacious against multidrug resistant (MDR) bacteria, have yet to successfully advance into clinical testing due to toxicity issues, mainly caused by their composite mixture of multiple compounds. This study aims to identify novel bactericidal compound(s) from commercially available essential oil against KPC-producing *Klebsiella pneumonia* to better understand the mechanisms involved. Firstly, the minimum inhibitory concentration (MIC) of essential oils will be determined, followed by the determination of fractional inhibitory concentration (FIC). In addition, time-kill assay, outer membrane permeability test, zeta potential value measurement, scanning electron microscopy and proteomic profiling will be carried out to assess the membrane disruptive ability of essential oil. Then, gas chromatography-mass spectrometry will be carried out to identify the compositions of selected essential oil whereby potential compound(s) will be selected based on their respective novelty in clinical usage. Selected compound(s) will be subjected to assays to compare their efficacy as antimicrobials when compared to the whole essential oil. Ultimately, this will help to determine and characterize novel and natural plant-based compounds which can potentially be developed into new therapeutic strategies to mitigate superbug resistance.

Biography

Lim Swee Hua Erin is presently working as an Assistant Professor in the Division of Health Sciences at Abu Dhabi Women's College, Higher Colleges of Technology in Abu Dhabi, United Arab Emirates and affiliated as an Associate Professor at Perdana University-Royal College of Surgeons in Ireland, Selangor, Malaysia. Her main research interests include analysis of carriage and transmission of multidrug resistant bacteria in non-conventional settings, besides an interest in natural products for antimicrobial testing. She also works on the elucidation of mechanisms of reversal of resistance in bacteria via investigating the immunological analyses of diseases, development of vaccination and treatment models in animals.

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