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The cancer chemo-preventive potential of novel *Streptomyces* strains derived from mangrove forest in Malaysia

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The global burden of cancer continues to surge, mainly due to aging and growth of the world population, on top of cancer-causing lifestyle behaviors including smoking, obesity and lack of exercise. The financial and economic impacts of cancer on health care, patients and society have urged the search for more effective and potent drug to combat and prevent its occurrence. Microorganisms have been an important source of bioactive natural compounds as they provide a sustainable production of bioactive metabolites with a reasonable cost. Members of family Actinobacteria, especially the genus *Streptomyces* have demonstrated exemplary performance in synthesizing bioactive metabolites. In fact, several chemotherapy drugs in use, e.g. Doxorubicin and Actinomycin were discovered from *Streptomyces*. Thus, it is important to continue the search for novel streptomycetes-derived bioactive compounds against cancer cells. Four novel *Streptomyces* species were identified from the poorly explored mangrove sediment (East Coast, Peninsular Malaysia) using polyphasic approach. These strains (designated as MUSC 26^T, MUSC 136^T, MUSC 149^T and MUSC 164^T) have demonstrated significant antioxidant activity and screened for cytotoxic activity against several human cancer cell lines (DU145, CaSki, A549, MCF-7, HT-29, HCT-116, Caco2 and SW480). Among the four strains, MUSC 136^T displayed highest cytotoxic activity against colon cancer cell line HCT-116, killing more than half of them at 400 µg/mL, which probably mediated through altering p53 protein and intracellular glutathione levels. Meanwhile, MUSC 164T demonstrated similar cytotoxic effect against HCT-116 with lowest cell survival recorded at 58.2±5.1% after treated with 400 µg/mL of the extract. A deeper investigation into the genome of these streptomycetes revealed potential production of interesting bioactive compounds, which include siderophore deferoxamine. Altogether, these findings suggested that the exploration of new taxa from underexplored area is a good strategy to discover useful bioactive compounds.

Biography

Learn-Han Lee is a PhD in Molecular Biology and a Senior Lecturer of Molecular Biology, PI of Novel Bacteria and Drug Discovery Research Group, School of Pharmacy, Monash University, Malaysia. He was awarded the prestigious title of Chartered Biologist (CBiol) from the Royal Society of Biology, UK in 2017. Currently, his researches focus on the study of novel bacteria discovery and bio-prospecting of secondary metabolites with anticancer properties. He is the Lifetime Member of Bergey's International Society for Microbial Systematics (BISMiS) and a Member of Royal Society of Biology (MRSB, UK). Furthermore, he is an Associate Editor for *Frontiers in Microbiology* and *Frontiers in Pharmacology*. He has 2 patents and published 2 academic books, 3 book chapters and 75 international articles, with a total citation of 877 and H-index of 17 and has received 19 awards from various reputable institutions.

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