

**DEVELOPMENT OF POTENTIAL MICROBIAL  
PHOTOSENSITISERS IN THE APPLICATION OF  
PHOTODYNAMIC THERAPY (PDT) FOR THE  
TREATMENT OF CANCER AND OTHER DISEASES**

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## 1.0 ABSTRACT

Photodynamic therapy (PDT) involves the administration of a nontoxic drug known as a photosensitiser, either systemically, locally, or topically to a patient bearing a lesion (frequently but not always cancer), followed by the illumination of the lesion with visible light (usually long wavelength red light), which, in the presence of oxygen, leads to the generation of cytotoxic species and consequently to cell death and tissue destruction. To date, few photosensitisers, such as Photofrin<sup>®</sup>, Levulan<sup>®</sup> and Foscan<sup>®</sup>, have been approved for PDT, but an ideal photosensitiser with regards to chemical purity, tumour selectivity, chemical and physically stability as well as rapid body elimination has not been found. Actinomycetes isolated from Sabah tropical forests soils, which could conceal potential therapeutic properties, were cultured aerobically for their secondary metabolites to screen for photocytotoxicity against human leukemic cell line HL60 using an MTT-based cell viability assay. 293 actinomycetes strains were tested in the assay, but none of them showed to possess photocytotoxicity properties. Of these, 14 strains, namely H11003, H11831, H11902, H7125, H7300, H7458, H7998, H8565, H8667, H8689, H8693, H8694, KA1016 and KA1022, showed marginal cytotoxic at a concentration of 100  $\mu\text{g mL}^{-1}$ , and were further assayed at a concentration of 20  $\mu\text{g mL}^{-1}$ . 3 crude extracts, namely H11003, H7998 and H8565 showed cytotoxic activity and were subjected to purification for pure compound.

