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Molecular biological determination of PKC inhibitory effects of 1,2,3-propanetriolmonoacetate produced from marine sponge associated bacteria

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Selective inhibition of protein kinase is an extremely challenging goal in the area of drug discovery. An exciting “marine pipeline” of new anticancer clinical and preclinical agents has emerged from intense efforts over the past decade to more effectively explore the rich chemical diversity offered by marine life. 1,2,3-Propanetriolmonoacetate was produced by the modified medium of Galdeano et al, 2007 with glycerol as carbon source from the marine sponge associated bacteria. Substrate concentration was optimized for the production of maximum biomass, which revealed 5% glycerol would be the optimum concentration. Preparative TLC was performed to purify the compound. RF value of the compound was found to be 0.773. GC/MS and NMR result proved the structure of 1,2,3-Propanetriol monoacetate. The compound of present study was previously used as a precursor for the production of triacetin (an antifungal agent). But it was produced by synthetic means. The present study revealed the capability of the sponge associated marine bacteria *Rhodopseudomonas palustris* MSB 55 to produce the compound naturally. There was no evidence of such compound to dock on to PKC but the present study proved that PKC can serve as a better target for 1,2,3-Propanetriolmonoacetate. There were no studies done with this compound to determine the cytotoxicity towards a breast cancer cell lines (MCF7) but the present study proved the activity of the compound against MCF7. RT-PCR result also revealed that there was a modification in the structure of PKC epsilon gene in terms of molecular weight in the cells treated with 1000 µg/ml, whereas the cells treated with 1500 µg/ml of the compound failed to express the PKC epsilon gene. Hence the compound 1,2,3-Propanetriol can be used as a therapeutic agent not only to produce triacetin but it may also serve as a prodrug cum vehicle for anticancer agents. Additive effect of this compound may facilitate the recovery of cancer with other anticancer agents.

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