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Irradiation of in vitro melanoma cells with low intensity laser in the presence of hypericin and aluminium (III) phthalocyanine chloride tetrasulphonate for use in photodynamic diagnosis

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Abstract content
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Introduction: Irradiation of certain photosensitizers with light leads to emission of a brick-red fluorescence. This principle may be used as a diagnostic procedure termed photodynamic diagnosis (PDD). Increasing incidence of malignant melanoma poses a threat to modern society and economy therefore requires considerable interventions for early diagnosis. The aim of the study was to determine the optimal combination of photosensitizer (Ps) and low intensity laser irradiation (LILI) to be used for PDD of melanoma cells. Materials and Methods: Melanoma cells (A375) were treated with various concentrations of Ps, (Hypericin (Hyp) or aluminium (III) phthalocyanine chloride tetrasulphonate (AlPcS4Cl)), for 1; 2; 4 and 24 h; varying LILI doses by itself or optimal concentrations of Ps combined with different laser light doses of suitable wavelength. Cell viability and cell morphology changes were determined after treatment of cells with either Ps or LILI by itself and when Ps was combined with LILI. Results: Both Hypericin and AlPcS4Cl accumulate in melanoma A375 cell line. No significant loss of cell viability or change in morphology was observed when cells were treated with Ps or LILI alone but when the cells were incubated with Hyp and AlPcS4Cl and irradiated with LILI at 532 nm and 682nm respectively, a time dependant decrease in cell survival was observed. With Hyp, a significant loss of cell survival was observed as early as 1hr after incubating cells with Hyp followed LILI at 532 nm. AlPcS4Cl therefore shows to be an ideal Ps to be used for PDD since it causes minimal photodynamic effects at short incubation periods.

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