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Curcumin an emerging natural photosensitiser for lung cancer photodynamic therapy

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G Kah, R Chandran and H Abrahamse

Laser Research Centre, Faculty of Health Sciences, University of Johannesburg, P.O. Box 17011, Doornfontein 2028, South Africa.

Email: rahulc@uj.ac.za

Abstract. Worldwide, lung cancer remains the main cause of malignant tumours and it contributes to a high mortality rate in cancer cases. Conventional therapeutic approaches for lung cancer are characterised as ineffective since resistance to therapy and toxic after-effects do occur in patients. Photodynamic therapy (PDT) is a promising therapeutic approach that requires a specific light source for the activation of a photosensitiser to induce cytotoxic cell death via the generation of reactive oxygen species. Curcumin is a natural compound from *Curcuma longa* that has been confirmed as a photosensitiser. This study aims to investigate the in vitro effects of curcumin-mediated PDT of lung cancer. Lung cancer cell lines (A549) were grown in complete media in an incubator maintained at 85% humidity, 5% CO₂, and a temperature of 37°C. Treatment of cells was achieved by exploring different concentrations of curcumin, and the cells were irradiated with a 470 nm diode laser at 5 J/cm² fluency. Post-PDT tests including microscopic evaluation of treated cells and biochemical analysis were performed to determine the cellular response of cells treated. The results revealed morphological alterations and decreased viability in treated cells, which signifies cytotoxic damage. Thus, the increased cytotoxic effect established in this study suggests that curcumin can be an effective natural photosensitiser over synthetic ones for mediating lung cancer PDT. Further in vivo studies may be needed to evaluate how curcumin can be utilized for lung cancer PDT in clinical settings.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

PhD

Primary author: KAH, Glory (University of Johannesburg)

Co-authors: Prof. ABRAHAMSE, Heide (University of Johannesburg); Dr CHANDRAN, Rahul (University of Johannesburg)

Presenter: KAH, Glory (University of Johannesburg)

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