



Contribution ID: 97

Type: **Poster Presentation**

Photodynamic Efficacy of a Chlorophyll based Photosensitizer Pheophorbide a against Resistant Breast Cancer Cells

Abstract: Effectiveness of anticancer therapies like chemotherapy and radiotherapy is primarily limited by development of multidrug resistant cancer cells, leading to enhanced progression, invasiveness and tumour metastasis with poor clinical outcome. Clinical findings suggest that employing mechanistically distinct therapies can overcome the resistance induced by another treatment. Photodynamic Therapy (PDT), a photochemical based anticancer treatment modality is a promising strategy to kill chemotherapeutic drug resistant cancer cells. Mechanistically PDT makes use of a light sensitive drug, photosensitizer (PS) which when excited with light of appropriate wavelength generates Reactive Oxygen Species leading to the destruction of tumour mass. Several plant-based PSs have been used for their phototoxic efficacy as well as being natural compounds they induce minimum side effects. In this study, Pheophorbide a, a chlorophyll derivative is being used as a potential PS to induce cell death in P-glycoprotein over-expressing Doxorubicin (DOX) resistant breast cancer MCF-7 cells. DOX resistant cancer cells were treated with different concentrations of Pheophorbide a followed by irradiation with 660 nm red laser at a light dose of 10 J/cm². The Pheophorbide a induced phototoxicity was evaluated by 3-(4,5-dimethyl-2-thiazyl)-2,5-diphenyl-2H-tetrazolium bromide (MTT) proliferation assay and by analysing cellular morphological changes, live dead assay and cell death assay. All experiments were performed thrice (n=3) and results obtained were analysed for statistical significance. Results showed that the pheophorbide a can induce photodynamic cell death in resistant cancer cells. Thus, the obtained results suggest the utilization of chlorophyll-based PS as a rational therapeutic intervention for the eradication of chemodrug-resistant cancer.

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

No

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

N/A

Primary author: Dr SARBADHIKARY, Paromita (Laser research Centre, Faculty of Health Sciences, University of Johannesburg)

Co-authors: Prof. GEORGE, Blassan (Laser research Centre, Faculty of Health Sciences, University of Johannesburg); Prof. ABRAHAMSE, Heidi (Laser research Centre, Faculty of Health Sciences, University of Johannesburg)

Presenter: Dr SARBADHIKARY, Paromita (Laser research Centre, Faculty of Health Sciences, University of Johannesburg)

Session Classification: Photonics

Track Classification: Track C - Photonics