Abstract

Abstract Title: Photodynamic Therapy of cervical cancer by eradication of cervical cancer cells and cervical cancer stem cells

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Abstract

The heterogeneous nature of cancer puts cancer stem cells (CSCs) at the beating heart of the tumour. Because of their inherent characteristics of stemness, CSCs evade putative cancer therapies, resulting in treatment resistance or tumour recurrence after a seemingly successful treatment. To prevent treatment resistance and cancer recurrence, targeting the cervical CSCs inherent to the tumour is of utmost importance. This study therefore, sought to determine the effect of Photodynamic Therapy (PDT) in eradicating cervical cancer and cervical CSCs. Photodynamic therapy utilizes a photochemotherapeutic compound, a photosensitizer (PS) which is activated by a specific wavelength of light to induce the formation of singlet oxygen molecules which targets the cancer cells and induce cell death through different mechanisms. Cervical CSCs were isolated from a cervical adenocarcinoma cell line, HeLa cells, and grown in liquid medium incubated at 37 °C, 5% CO2 and 85% humidity. Increasing doses of AlPcSmix PS were administered to both the total cell population and the isolated CSCs, and irradiated using 673.2 nm diode laser. Post-irradiation cellular changes were observed using biochemical assays and microscopy to determine the response of both the total cell population and the CSCs. Results showed a dose-dependent response of both cell populations to treatment, by demonstration of significant morphologic changes, increased cytotoxicity, and decreased cell viability and proliferation. The study suggested that PDT using AlPcSmix is a very effective treatment method for the eradication of cervical cancer cells and cervical CSCs, *in vitro.*

Keywords— *Cancer stem cells, Cervical cancer, Photodynamic therapy, Photosensitizer*

Professional Biography (100-150 words)

Heidi Abrahamse PhD Wits, (Biochemistry, Molecular Biology), is currently the Director of the Laser Research Centre, University of Johannesburg and Department of Science and Technology / National Research Foundation SARChI Chair for Laser Applications in Health. Her research interests include, photobiology and photochemistry with specific reference to photodynamic cancer therapy, stem cell differentiation and wound healing. She has supervised 40 masters; 15 doctorates and 12 post-doctorate fellows and has published over 150 peer reviewed accredited journal publications, 42 accredited full paper proceedings and 11 chapters. She serves on the editorial boards of 8 peer-reviewed internationally accredited journals while acting as reviewer for over 30 journals. She is also the Co-Editor in Chief of the international accredited journal Photomedicine and Laser Surgery.



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Any Comments: I kindly request consideration for a plenary or keynote presentation.