

Evaluation of photodynamic treatment using aluminum phthalocyanine tetrasulfonate chloride as a photosensitizer: New approach

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Photodynamic therapy (PDT) is a treatment modality that has been used in the successful treatment of a number of diseases and disorders. PDT uses a combination of a selectively localized light-sensitive drug (known as a photosensitizer) and light of an appropriate wavelength used in conjunction with molecular oxygen to elicit cell death. In the current study, T24 cells (bladder cancer cells, ATCC-Nr. HTB-4) were subjected to PDT with aluminum phthalocyanine tetrasulfonate chloride (AlS₄Pc-Cl) and red laser light at 670 nm. Results showed that cytotoxicity of PDT using AlS₄Pc-Cl followed both the concentration of the sensitizer as well as the irradiation energy in a dose dependent manner. Confocal laser scanning microscopy was used to study the intracellular phthalocyanine localization and the morphological changes occurring upon photosensitization. Raman microspectroscopy is considered as one of the newly established methods used for the detection of cytochrome c as an apoptotic marker. Results showed that PDT treated T24 cells seem to undergo apoptosis after irradiation with 3 J cm⁻². Cytochrome c could not be detected from cells incubated with AlS₄Pc-Cl using Raman spectroscopy whereas AlS₄Pc-Cl seems to interfere with the Raman spectrum of cytochrome c.

Biography

Rehab Amin's primary area of research is in the field of Biophotonics. She received her PhD from National Institute of Laser Enhanced Sciences (NILES), Cairo University. She worked initially in photodynamic therapy (PDT) for the treatment of cancer and bacterial cells. Her research interests are now broadly in the area of Bio-nano-photonics. In 2010, she awarded L'Oréal-UNESCO Pan Arab award for Women in Science for her research in the field of photobiology. In 2013, she has been appointed as an assistant professor at NILES, Cairo University. Currently she is in short visit at Wellman Center for Photomedicine, Massachusetts General Hospital, Medical School of Harvard University.

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