THE INTERACTION OF CHLORIN PHOTOSENSITIZERS WITH POTENTIAL NANOSCALE CARRIES

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Photodynamic therapy (PDT) uses appropriate photosensitizers (PSs) that are activated by red light to form reactive oxygen species viz. singlet oxygen $^1\text{O}_2$ (Type II photochemical mechanism) or various radical forms ($\text{HO}\cdot$, $\text{O}_2\cdot^-$) and H_2O_2 (Type I photochemical mechanism). These species oxidize biomolecules and destroy malignant or microbial cells inducing necrosis or apoptosis [1, 2]. Antimicrobial photodynamic therapy (APDT) can treat localized bacterial or fungal infections, whereas antitumor PDT focuses on treating superficial tumors [2]. In this short communication, we consider the results of our recent studies on the interaction of cationic or anionic chlorin photosensitizers (PSs) of second generation with potential nanoscale carries such as non-ionic surfactant Tween 80 (a) and some polymers viz. polyvinylpyrrolidone (b), ϵ -polylyzine (c), pluronic P123 (d) by the absorption and fluorescence spectroscopy techniques.

Our results indicate that both cationic and anionic macrocycles form stable complexes with potential carrier systems, the PS molecules being located in the periphery of micelles nearby the hydrophilic head groups of the carrier molecules. Other details of this investigation viz. the PS structures, their ability to generate singlet oxygen, to associate and aggregate at therapeutic concentrations etc. will be given in the presentation.

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References

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