

Polymeric Micelles as a Strategy to Optimize the Properties of Phenazine Photosensitizers †

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Abstract: In the search for ideal photosensitizers (PSs), interest arose in phenazine compounds, such as Neutral Red (NR) and its halogenated derivative (NRBr). Although they have shown very good results in the inactivation of *Staphylococcus aureus* in its free form in an aqueous solution, they have some undesirable properties that could be overcome by drug delivery systems. In this work, the use of polymeric micelles was proposed for developing nanophotosensitizers from Pluronic P-123 and F-108. The micellar systems developed had a size close to 30-40 nm and allowed obtaining of seven nanophotosensitizers. All of them increased the chemical stability of NRBr in a buffer solution of pH=7.4 and did not affect the stability of NR, which was already stable in this medium. Furthermore, the Pluronic micelles markedly decreased the aggregation of PSs and increased their photochemical reactivity. The nanophotosensitizers prepared from Pluronic P-123 micelles (5% w/v) showed the best results. Therefore, it is concluded that these polymeric micelles are a successful alternative for the vehiculation of NR and NRBr since they allow optimizing the properties of these compounds. The new nanophotosensitizers are excellent candidates for their application in the inactivation of Gram-positive bacteria.

Keywords: neutral red; mono brominated neutral red; Pluronic P-123; Pluronic F-108.

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Conflicts of Interest

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