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Targeted Destruction of Triple Negative Breast Cancer using Nanoparticles

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Photodynamic therapy (PDT) is a combination of light and photosensitizing drug in which a photosensitizer is injected intravenously and accumulates in the tissue. This tissue is then irradiated by light at an appropriate wavelength and the drug leads to cytotoxicity with a cascade of biochemical responses which affects and inactivates the cancer cells in the tumor tissue.¹ In the cells, PDT generally induces mitochondrial damage and apoptosis which destroy the tissue and induce an antitumor activity upon illumination.²

Benzoporphyrin-derivative verteporfin (BPD) and curcumin are two photosensitizer drugs having the capability in use of PDT. The therapeutic potential of BPD and curcumin as photosensitizers is limited by their low aqueous solubility and applicability. In this study, it is aimed to increase the bioavailability of these drugs to induce antitumor activity in the tumor cells. Liposomes and PLGA-based polymeric nanoparticles (PLGA NPs) are used as the drug carrier nanoparticles which have been considered as perfect carriers for cancer therapeutics and they are remarkably used in cancer therapy.^{3,4} BPD and curcumin-loaded liposomes and PLGA NPs were synthesized and characterized in terms of size, zeta potential, drug encapsulation efficiency and morphology. These nanoparticles were targeted towards breast cancer cell line (MDA-MB-231) *in vitro* MTS cytotoxicity assays and imaging.

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