## Liposomes loaded dual clinical photosensitizers for enhanced photodynamic therapy of cervical cancer

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## Abstract

Photodynamic therapy (PDT) has become a potential anti-cancer strategy owing to its negligible invasiveness, low toxicity and high selectivity. Photosensitizer (PS) plays an indispensable role in PDT. Herein, a new kind of PS (Ce6-MB@Lips) was designed and synthesized. The two kinds of US Food and Drug Administration (FDA) approved organic dyes Methylene blue (MB) and Chlorin e6 (Ce6) were encapsulated by liposomes via the film dispersion method to form Ce6-MB@Lips. The Ce6-MB@Lips showed a spherical nanostructure with an average particle size of 188.4 nm, and excellent water solubility. Then the optical properties of Ce6-MB@Lips were further studied. Ce6-MB@Lips showed absorption peaks at 413 nm/670 nm, and fluorescence peak at 678 nm. Compared with free Ce6 and MB, Ce6-MB@Lips showed better stability and stronger fluorescence intensity. Cell experimental analysis exhibited well cell uptaking ability and low cytoxicity of Ce6-MB@Lips. Especially, compared with free Ce6 and MB, Ce6-MB@Lips has better stability, biocompatibility and phototoxicity. Moreover, Ce6-MB@Lips could generate more reactive oxygen species (ROS) in vitro than free Ce6 and free MB, so as to induce the HeLa cells apoptosis. The Ce6-MB@Lips could be a promising candidate for PDT of cervical cancer.

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