

## عنوان مقاله:

An In-Vitro Study on Photochemical Internalization of Methylene Blue with Gold Nanoparticles Coated By Thio-Glucose

## محل انتشار:

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## خلاصه مقاله:

**Introduction:** Photochemical internalization is a novel PDT-based technology for the intracellular delivery of hydrophilic macromolecular therapeutic agents and other drugs limited in penetration into cellular membranes with intracellular targets. In this regard, one of the approaches is to use nanoparticles along with photosensitizing agents. In this study, the presence of thioglucose-coated gold nanoparticles in the efficiency of the photodynamic effect of methylene blue (MB) caused by the photochemical internalization phenomenon was investigated. **Material and Methods:** First, Glu-GNPs was synthesized, and then the toxicity of Glu-GNPs and MB were determined to achieve their optimal concentrations. Afterward, the photodynamic effects of Glu-GNPs combined with MB by Luma-Care source light were evaluated at different doses using MTT assay and colony assay (۱۲ days after treatment). **Results:** According to the MTT assay, the photodynamic effect in the Glu-GNPs group revealed no significant efficacy, whereas the colony-formation capability in all groups with an optical dose of  $۱۵.۶ \text{ J / cm}^2$  decreased, compared to the similar group without light exposure ( $P < ۰.۰۵$ ). **Conclusion:** The photodynamic efficiency of MB with the Glu-GNPs group was reduced at  $۱۵.۶ \text{ J/cm}^2$ , compared to the free MB group. The decreased efficiency can have various reasons such as the photochemical bleaching of the free MB because of ROS and  $^{1}O_2$  produced by the plasmonic photodynamic phenomenon of Glu-GNPs or changing the optophysical properties of surface plasmon resonance of final product (MB+ Glu-GNPs) due to the possible electrostatic bonding of the drug with the nanoparticles

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