

# Application of Photothermal Therapy for the Treatment of Melanoma in Immunodeficient and Immunocompetent Mice

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Melanoma is the most aggressive type of skin cancer and a major health problem. Even with a low incidence, it has a high mortality rate when not diagnosed at local stage. The standard treatment is surgery and for advanced stages, treatments such as chemotherapy, radiotherapy and immunotherapy are only palliative. There is a need, therefore, to develop new therapeutic options. In the case of cutaneous melanoma, therapies that use light in the wavelength of visible light show a poor response due to the limitation of light penetration into the tumor caused by melanin.

In this study, the effect of an indocyanine green nanoemulsion (Nano-dICG) was evaluated in immunodeficient and immunocompetent mice for the treatment of *cutaneous melanoma*. Photothermal therapy (PTT) was performed with irradiation at 808 nm and irradiance 0.5 W/cm<sup>2</sup>. Photoacoustic and fluorescence imaging were the techniques used to find the best time of accumulation of the molecule intravenously (IV) administrated. PTT was performed for light only, 1 and 6 h after Nano-dICG IV injection. Each 3 days after treatment bioluminescence imaging was acquire for a total period of 30 days. For immunodeficient mice, all animals for the light only group showed regrowth of tumor, but the survival was increased. For 1 and 6 h, the response to treatment was similar with 50 and 66% of survival after 30 days, respectively. The response for the immunocompetent for the light only group showed 66