Response to the Treatment of Non-Melanoma Skin Cancer with Photodynamic Therapy in Diabetic Mice

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Cancer treatment continues to be an enormous challenge in global health and considering the limitations of traditional techniques such as chemotherapy, the research on photodynamic therapy (PDT) indicates its benefit of reducing side effects and localized treatment of tumor cells. Among cancer types, non-melanoma skin cancer is one of the most common in the general population and its treatment with PDT is well recorded in scientific literature. However, there is a deficit in the understanding on how patients with metabolic diseases like diabetes respond to the therapy. As such, our project proposes the investigation of the effects of topical PDT using ALA-based cream and microneedling with SCC. Balb/c Nude mice are injected with streptozocin to develop diabetes and tumors are induced intradermically using A431 cells in Geltrex. Tumor volume is checked with a digital caliper until it reaches 15 to 25 mm^3, where PDT is conducted with PpIX precursor, ALA. The tumoral region is irradiated using a locally-made illumination tip, LINCE, with 40 mW/cm^2 for 10 minutes. Biopsies are excised from the euthanized animal for analyses using histological slides, mitochondrial respirometry and immunohistochemistry.