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Laser Assisted Cancer Immunotherapy: Optical Dye Distribution in Tumors[1] RYAN SWINDLE, PRADIP BANDYOPADHYAY[2], Hendrix College
— Laser Assisted Cancer Immunotherapy is an experimental modality used to treat superficial tumors implanted on sterile Balb/C mice. The goal of the project is to induce a positive immune response toward a complete eradication of the primary tumor. Optimal necrosis results from depositing the maximum amount of thermal energy into the tumor without damaging the surrounding healthy tissue. In our laboratory, the optical dye, indocyanine green (ICG), is injected into the center of the tumor prior to surface and interstitial laser irradiation. A diode laser operating at a wavelength near 804 nm exerts thermal energy into the tumor via ICG absorption at 790 nm. Maximum immune response should occur with a uniform distribution of ICG throughout the tumor. By mapping the ICG distribution, the spatial homogeneity of the dye can be determined, which, in turn, mimics the tumor temperature profile. After excision, the tumors were cut into samples of approximately 250 microns thick and dissolved in a chemical detergent. Each sample was run through an absorption spectrometer to determine the distribution of ICG throughout the tumor. Results for both radial and depth profiles of ICG tumor distribution will be presented.

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[2]Research Advisor

Ryan Swindle
Hendrix College

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