

Abstract Submitted  
for the NWS08 Meeting of  
The American Physical Society

**Studying Light Propagation in Bone for Treatment of Bone Cancers with Photodynamic Therapy** VINCENT ROSSI, OSU Department of Physics, SCOTT GUSTAFSON, VCA Raleigh Hills Animal Hospital, STEVEN JACQUES, OHSU Biomedical Engineering Department — Photodynamic therapy makes use of light, photosensitizing agents, and oxygen as a selective means of treating cancer. The work presented is aimed at applying photodynamic therapy towards treatment of osteosarcoma in small animal clinics. To best facilitate clinical treatments, we must first understand how light propagates and how best to deliver adequate light to achieve phototoxic effects within bone. This work aims at characterizing how light propagates through bone and then applying that knowledge towards predicting light distributions in bone. Reflectance spectroscopy using an optical fiber source-collector pair is used to determine the scattering properties of bone tissues, and the absorption due to water and oxygenated and deoxygenated hemoglobin—native absorbers at visible and near-IR wavelengths. Resulting optical characterizations are then applied to a cylindrically symmetric Monte Carlo model in order to predict and guide the delivery of light within bone in order to achieve the desired phototoxic effect.

Vincent Rossi  
OSU Department of Physics

Date submitted: 18 Apr 2008

Electronic form version 1.4