

AbstractID: 1563 Title: In vivo measurement of motexafin lutetium fluorescence in mice

Fluorescence spectroscopy has been used to characterize the distribution and kinetics of photosensitizers used in photodynamic therapy (PDT). We present a method to rapidly characterize the concentration and distribution of the photosensitizer Motexafin Lutetium (MLu) *in vivo* using fluorescence spectroscopy in RIF tumors grown in CH3 mice. Fluorescence spectra were obtained using a single fiber inserted interstitially into the center of each tumor. The use of a single fiber for delivery of excitation light and collection of emitted fluorescence minimizes the effects of changes in tissue optical properties and confines the region of tissue interrogated by the measurement to a very small volume. The fiber is automatically advanced along a clear catheter by a computer-controlled step motor, allowing the acquisition of a spectrally resolved fluorescence distribution. This set of fluorescence spectra are then fit using a linear fitting algorithm to determine the distribution of MLu within the tissue. The amplitude of MLu varies by as much as a factor of two over the length of a single tumor, with the highest signal occurring at the tumor periphery and the lowest toward the tumor interior. We demonstrate that our measurements of each tumor's mean MLu concentration are quantitatively accurate by comparison with an established *ex vivo* assay.