

A CONFOCAL RAMAN MICROSCOPY STUDY OF CELL PENETRATING PEPTIDE UPTAKE IN LIVE MELANOMA CELLS Andrew C. Terentis, Jing Ye, Sara A. Fox, Mare Cudic, Evonne M. Rezler, Janelle L. Lauer, Gregg B. Fields, Department of Chemistry and Biochemistry, Florida Atlantic University, Boca Raton FL 33431

Cell penetrating peptides (CPPs) have attracted widespread interest as potential drug delivery vectors. The mechanism(s) by which CPPs cross the cell membrane is/are yet to be fully characterized, and more specifically the potential role of CPP secondary structure in this process has not yet been determined. Therefore we have performed confocal Raman microscopy experiments on two CPPs, penetratin and transportan, in live melanoma cells in order to gain unprecedented insights into the intracellular structure, microenvironment and fate of these peptides. Both peptides were observed to rapidly accumulate inside the cell at room temperature, although penetratin tended to accumulate largely in the cell nucleus whereas transportan did not. The structures of the peptides in solution were similar to those observed in the cytoplasm but not the nucleus. The data for both peptides indicated a probable non-endocytotic mechanism of uptake under the conditions of study.