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Modified GSH embedded in gelatin elucidates the penetration depth of COST-Jet generated reactive species. PIETRO RANIERI, DUNCAN TROSAN, KATHARINA STAPELMANN, North Carolina State University — Treatment of biological tissues for cancer treatment and wound healing using non-thermal plasma are limited when considering practical implementation due to the proper 'dose' for the application. The correct 'dose' is application and plasma source dependent, however the metrics for the proper 'dose' are efficacious treatment and limited damage to the tissue. Two major questions required to define the 'dose' are: 1) what is the physical penetration depth of plasma-generated species, and 2) what is the penetration depth of the plasma-induced effects? It is established that while plasma species may only penetrate through a fraction of a millimeter, the biological effects are observed up to centimeters into the tissue [1-2]. Several agarose, gelatin, cellular scaffold and spheroid models were developed to answer these questions [3]. In this study, we use a 40% gelatin matrix (for a 60% water content comparable to skin) embedded with glutathione to track the physical penetration of reactive species generated by the COST-Jet. Using 3-D Raman spectroscopy, we observe glutathione modifications in depth as a representation of the physical penetration of reactive species. The COST-Jet was operated under different admixtures to analyze the depth of penetration of different unique chemistries. The resulting Raman spectra will presented. [1] P.Ranieri et al, Plasma Med. 7, 283–297 (2017) [2] A. Lin et al., Oncoimmunology 7.9 (2018) [3] X. Lu et al., Materials Science and Engineering: R: Reports 138, 36-59 (2019)

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