Novel Biophotonic Approaches to Traumatic Brain Injury

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This presentation will delve into innovative biophotonic techniques that leverage light as a photophysical mechanism for the study of cellular dynamics. Focusing on traumatic brain injury, which contributes to approximately 30% of all injury related deaths in the United States [1], we will outline our recent findings on the under-explored cellular mechanisms involved. Our research sheds light on the role of astrocytes in injury response and repair [2], demonstrating how photonic tools can not only aid in understanding but also serve as diagnostic tools [3]. By integrating these methods, we aim to enhance our comprehension of the pathology of traumatic brain injuries and introduce new therapeutic avenues through the application of light's unique capabilities.

References

[1] CDC website $https://www.cdc.gov/traumatic-brain-injury/data-research/facts-stats/$ (2019)

[2] P Pouladian, T Yamauchi, N M Wakida, V Gomez-Godinez, M W Berns and D Preece, Biomed. Opt. Express **12**, 4020 (2021), DOI: 10.1364/BOE.427693; PMID: 34457396; PMCID: PMC8367238

[3] P Pouladian, J Ho, N Perez, N M Wakida, V Gomez-Godinez and D Preece, bioRxiv: 2023.11.29.569124 (2023)