

I am a Research Assistant Professor in the department of Neurological Surgery, Northwestern University. My research contributions are in the domain of cancer biology and therapeutic targeting of cancer. In my graduate studies, I established a novel role of cytoskeletal protein vimentin in the progression of oral cancers. I identified function of vimentin in promoting tumor cell migration (Dmello et al., IJCB 2016), as well as its role in epithelial mesenchymal transition (Dmello et al., PlosOne 2017) and transformation from premalignancy to malignancy (Dmello et al., Experimental and Molecular Pathology, 2018). I established the efficacy and toxicity profile for the SonoCloud 9 device in preclinical models (Zhang, Dmello et al., CCR, 2020) for its proposed use in humans. This work formed the basis for the SonoCloud 9 phase I clinical trial (NCT04528680) in recurrent glioblastoma (GBM) patients. Further, I developed a novel biomarker to predict which patients will respond to the paclitaxel (PTX) treatment using in vitro CRISPR screening technology (Dmello et al., CCR, 2022). Given this discovery (US Patent App. 63/202,761), one of the primary outcomes of Phase II clinical trial NCT04528680) was to determine relationship between the biomarker and overall survival of the treated patients. Alongside, I discovered a druggable kinase called as Checkpoint kinase 2 (Chek2) that renders gliomas (high-grade brain tumors) responsive to immunotherapy (US Patent App. 16/951,638) using in vivo CRISPR technology (Dmello et al., Nature Communications, 2023). In this R01 proposal, I seek full independence as a scientist to begin the scientific journey of my laboratory that focuses on identification and targeting of glioma intrinsic immunosuppressive candidates. This R01 application will elucidate the novel mechanism/s by which Chek2 facilitates escape from CD8 T cell recognition and lay foundation to study such non-canonical functions of immune-modulatory candidates that prevent response to immunotherapy in gliomas.