The Damon Runyon foundation funds brilliant young scientists proposing high-risk, high-reward projects in cancer research. Dr Tuyu Zheng has been selected for their prestigious Postdoctoral St. Jude Pediatric Cancer Research Fellowship Award, which focuses on breakthrough work in the prevention, diagnosis, or treatment in pediatric cancers. Her project, titled “Functional characterization of tumor neuronal networks that drive ependymoma” is co-supervised by Drs Stephen Mack and Lindsay Schwarz in the Department of Developmental Neurobiology at St. Jude’s.

Dr Zheng earned her PhD from University of Heidelberg in Cancer Biology studying cell-intrinsic signaling in ependymoma, a devastating cancer originating from the cells lining CSF compartments of the brain and spinal cord. Her current work in Cancer Neuroscience builds on that framework and leverages tools she developed during her PhD work to examine signaling between tumor and environment.

This work examines the complex communication between neurons and tumor cells in a native tumor model, or one that is not implanted. This powerful model allows for the study of tumors in the developmental context and can be combined with the powerful mouse genetic toolkit for asking advanced neuroscience questions. In this work, Dr Zheng and mentors will examine how these tumor-environment interactions regulate tumor growth. Approximately 50% of ependymoma patients develop seizures, suggesting crosstalk between tumor and surrounding neurons increases neuronal activity which may subsequently increase tumor growth and progression.

Among key questions in this work, Dr Zhang will examine how neuropeptide Y, a neuromodulator of diverse nervous system functions including cell growth and proliferation, regulates tumorigenesis and remodeling of other cells in the environment. She also plans to map connections between tumor and brain and manipulate activity of connected neurons to determine the role of direct neuronal activity on tumor growth.