Elias Perli
Campus: CHI-St Joseph's Health, Bryan, TX
Research Area: Neurosurgical management for self-inflicted gun head injury
Mentor: Jason Hoover MD, Gloria M. Conover PhD, Steve Maxwell PhD and Ashok Shetty, PhD

Elias Perli, a member of the Class of 2025 in the School of Medicine, is writing a review article on the neurosurgical management of a patient with a self-inflicted gunshot wound to the head, as part of his MEID 820 course directed by course directed by Gloria M. Conover, Ph.D. and Steve Maxwell Ph.D. faculty in the Texas A&M Department of Medical Education, under the mentorship of Jason Hoover M.D., Neurosurgeon at Texas Brain and Spine Institute and CHI St. Joseph Hospital in College Station, TX and collaboration with Ashok K. Shetty, Ph.D., Department of Cell Biology and Genetics at Texas A&M University. Gunshot wounds to the head (GSWH) are one of the worst outcomes from civilian firearm injuries and a major public health concern in the United States in need of further systematization of treatment and advancement in research. Neurosurgical management of GSWH is critical given the increased morbidity and mortality associated with the craniocerebral injuries from ballistic trauma. Likewise, understanding the pathophysiology of traumatic brain injuries (TBIs) and GSWH can help shed light for new treatment options. Some of the major etiologies for GSWH thus far include, but are not exclusive: gliosis (nonspecific, reactive inflammatory response from insult to the brain), meningitis (infection from bullet, shrapnel, and direct communication with outside environment), and CSF leakage (skull fracture from gunshot wound). Astrocytes are specialized and homeostatic glial cells that expand the entire central nervous system (CNS) and exert essential complex functions in the healthy CNS. Astrocytes also contribute to brain defense either when cell-autonomous changes drive a pathologic progression (e.g. senile dementia, neurodegeneration) or when astrocytes respond to lesions or to various pathological changes in the nervous tissue (e.g. TBI, infection). Microglia are other type of glial cells also involved in the pathophysiology of TBI as part of the innate immunity after insults to the brain. Different aspects and mechanisms of microglia are also under study to understand their role in TBI, such as microglia inflammasome activation. As a medical student, Perli is interested in exploring the pathophysiology behind TBIs to better comprehend the mechanism behind these traumatic neurological pathologies and help in the advancement of neurosurgical treatment of GSWH.