Injury Models

Blast Exposure Causes Phosphorylation of Tau at Serine 396: A Potential Predisposition to Alzheimer's-Like Neuropathology

Blast-induced TBI is associated with acute and chronic neuropathological and neurobehavioral deficits. Tau protein, phosphorylated at serine 396, is rich in paired helical filaments that form neurofibrillary tangles (NFT) observed in the brains of patients with Alzheimer's disease. The number of NFTs is tightly linked to the degree of dementia, indicating that the formation of NFTs may underlie and contribute to neuronal dysfunction. Researchers at WRAIR evaluated brains of rats after exposure to single and closely coupled repeated blast overpressure and detected that phosphorylation of tau protein occurs preferentially at serine 396 in a severity-dependent, regionally selective manner. These results indicate that acute tau protein phosphorylation at serine 396 and chronic accumulation of amyloid precursor protein in the brain after blast exposure may predispose to Alzheimer's-like neuropathology.