DVBIC-TBICoE 15-Year Studies Research Findings: Blood-Based Biomarkers of TBI

Traumatic Brain Injury Center of Excellence

WHAT ARE BLOOD-BASED BIOMARKERS?

Blood-based biomarkers are small-molecule indicators of biological and pathological processes detected in the blood.

WHERE DO BIOMARKERS OF TBI COME FROM?

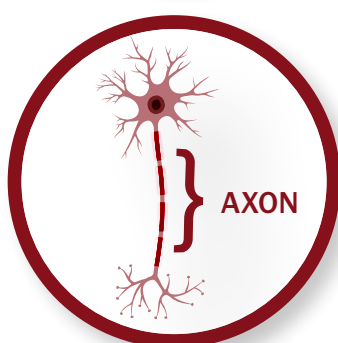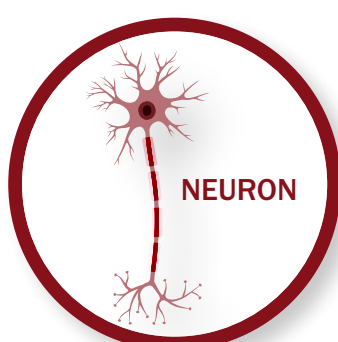Biomarkers are released from damaged and disrupted cells (e.g., astrocytes and neurons) following TBI.

WHAT CAN BLOOD-BASED BIOMARKERS DO?

- Detect injury occurrence (diagnostic)
- Predict patient outcomes (prognostic)
- Inform treatment development

WHAT TBI BIOMARKERS WERE STUDIED?

LOCATION	BIOMARKER
NEURON	UCH-L1 (Ubiquitin C-Terminal Hydrolase L1)
ASTROGLIA	GFAP (Glial Fibrillary Acidic Protein)
AXON	NFL (Neurofilament Light Chain), Tau Protein

WHAT HAVE WE LEARNED SO FAR?

DIAGNOSIS

- NFL and GFAP were useful at identifying service members and veterans with moderate or severe TBI during the first year of recovery.

PROGNOSIS

- Blood-based biomarkers detected during the first year of recovery were shown to predict future cognitive decline within three or more years following a TBI of any severity.
- Elevated blood-based biomarkers (i.e., tau, NFL, GFAP, and UCH-L1) within the first 12 months of injury were indicative of worse future neurobehavioral symptoms following TBI, regardless of severity.

CLINICAL IMPACT

- A biomarker blood panel test administered to assess tau, NFL, GFAP, and UCH-L1 within the first few days to 12 months of injury may serve as a useful tool to determine TBI severity, as well as predict risk for future cognitive decline and neurobehavioral outcomes.

CURRENTLY, NO BLOOD-BASED BIOMARKERS CAN RELIABLY BE USED AS A STANDALONE METHOD TO DIAGNOSE TBI

HAVE SPECIFIC QUESTIONS? CONTACT US!

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