



For Immediate Release

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CU NEUROSURGERY LAUNCHES CUTTING EDGE BIOMARKER RESEARCH WITH ULTRA EARLY STROKE PATIENTS

(AURORA, CO). April 12, 2021. The Department of Neurosurgery is excited to announce our participation in a collaborative research study with the UHealth Mobile Stroke Unit. Principal Investigator, Robert Kowalski, MD, MS and Co-Investigator Michael Graner, PhD (both from the Neurosurgery Department) will be collecting blood samples from patients who are seen by the Mobile Stroke Unit (MSU) to characterize ultra-early biomarkers in acute ischemic stroke. In conjunction with William Jones, MD from the Neurology Department, the group will be evaluating cellular (exosomes), molecular (proteins, neuroinflammatory factors, microRNA) and metabolomic biomarkers obtained in the minutes after stroke symptom onset, and their association with stroke diagnosis, intracranial hemorrhage, and neuroinflammation.

“Although similar ultra-early biomarkers are being obtained for ongoing research in Berlin, we are not aware of anyone else in this country collecting these ultra-early samples,” states Dr. Kowalski. The research will be applying a novel approach by obtaining blood samples in the field on a Mobile Stroke Unit with an onboard CT scanner for concurrent brain imaging and validating these findings in a broader multi-center sample. UHealth is only one of a handful of stroke centers who have these Mobile Stroke Units in the country.

The research will be applying a novel method developed in the lab of Michael Graner, PhD, to isolate biomarkers with a CNS source by specific heat shock proteins on the surface of exosomes. Phase 1 (exploration phase) of the study has several aims. It is identifying blood-based ultra-early exosomes, proteins, and neuroinflammatory factors immediately after ischemic stroke onset. This will compare findings with brain imaging and short-term outcome. It is evaluating hyper-acute blood-based exosomes, proteins, and neuroinflammatory factors for hemorrhagic stroke identification. This will compare target blood-based biomarkers with CT brain imaging obtained simultaneously on the mobile stroke unit to rule out intracranial hemorrhage. It also is evaluating association between ultra-early blood-based biomarkers and timing of stroke onset.

Phase 2 will assess blood-based, ultra-early acute stroke exosomes, proteins, and neuroinflammatory factors – based on findings from Phase 1 -- in a demographically and geographically diverse sample of stroke patients treated on mobile stroke units at other U.S. centers, including those in an MSU consortium, the Pre-Hospital Stroke Treatment Organization (PRESTO).

The Department of Neurosurgery is very excited to be a part of such cutting edge research that would not be possible if it weren't for the cooperation and collaboration of UHealth and its Mobile Stroke Unit, under the management of David Ornelas, RN.

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