PROTEOMIC ASSESSMENT OF FLUID SHIFTS AND ASSOCIATION WITH VISUAL IMPAIRMENTS AND INTRACRANIAL PRESSURE IN TWIN ASTRONAUTS

Specific Aims
To explore proteomic and genomic biomarkers underlying space flight-induced fluid shifts and visual impairment & intracranial pressure (VIIP) symptoms.

The proteome is the set of proteins produced by the genome at a given time. Proteomics captures the state of molecular and cellular processes at a specific time point.

Implications of the Research for Space & Earth

Space: Discovery of molecular pathways involved in the evolution of spaceflight adaptations related to fluid redistribution in-flight and the etiology of visual acuity and ocular changes in-flight and post-flight.

Earth: This project has broader impact on Earth-based clinical areas such as traumatic brain injury-induced elevations of intracranial pressure, hydrocephalus, and glaucoma.

In-flight Operations
Blood Plasma collection
Ultrasound measures of fluid shifts
Intracranial Pressure
Intraocular Pressure
Ocular Structure
Blood Pressure
Heart Rate
Vascular Resistance

Pre- and Post-flight Testing
All in-flight operations and:
Tissue hydration
MRI

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