Government of Canada / Gouvernement du Canada

Joint Federal Research Funding for Military Personnel and Veterans

Project Report Summary Template

Funding Opportunity
PET Tau Brain Imaging and Blood-Based Molecular Biomarkers of Tauopathy
Brief Overview
This project is investigating advanced brain imaging and blood-based biomarkers to improve the detection and understanding of chronic traumatic encephalopathy (CTE) and related tau-related neurodegenerative changes in blast-exposed military personnel, particularly members of the Canadian Special Operations Forces (CANSOF)
What is this Research About? Repeated blast exposure may increase the risk of developing neurodegenerative conditions, including CTE. Current imaging technologies have limitations in detecting certain forms of tau protein accumulation in the brain. This research aims to improve the identification of tau-related pathology through novel positron emission tomography (PET) imaging techniques and blood-based biomarkers, while also examining how tau accumulation relates to cognitive and neurological symptoms in military populations.
What did the Research Do? Researchers pursued three primary objectives: • Evaluated the use of advanced PET imaging technologies, including[18F]OXD-2314, to identify and quantify 4R-tau accumulation associated with CTE that may not be detected using existing PET tracers. • Investigated novel blood-based molecular biomarkers that may support early diagnosis and risk prediction for tau-related neurodegenerative disease in blast-exposed individuals. • Examined relationships between tau accumulation and clinical outcomes, including cognitive and neurological deficits, to better understand disease progression and monitoring
What did the Research Find? The study arm using[18F]flortaucipir PET imaging in blast-exposed CANSOF members was completed and published. The second study arm evaluating[18F]OXD-2314 remains ongoing, with participant recruitment, imaging, and data analysis continuing. Preliminary OXD imaging data are currently being analyzed and interpreted by the research team. Researchers also reported that conducting an early-stage translational PET imaging study using a novel tau radiotracer proved more complex and time-consuming than anticipated. Challenges included radiochemistry coordination, participant recruitment and scheduling, imaging workflow **optimization,** and development of imaging acquisition and analysis protocols. Additional effort was required to ensure robust quality control and interpretation of emerging imaging findings.

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What does this Research Mean?

This research is advancing the development of new tools for detecting and monitoring tau-related neurodegenerative changes in blast-exposed military personnel. If successful, the novel imaging and biomarker approaches may improve early diagnosis, risk assessment, and monitoring of CTE and related conditions. Continued collaboration with CANSOF and ongoing recruitment and analysis will help ensure scientifically rigorous and operationally relevant findings that may support future clinical care and research for military members and Veterans

Sources

RF-0032-PET Tau JFRFP-Final Report. Joint Federal Research Funding Program for Military Personnel and Veterans Final Report.

Related publication:

- Study arm evaluating **[18F]flortaucipir PET imaging** in blast-exposed CANSOF members published in *Brain Communications*.

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