Fiscal Year:	FY 2012	**Task Last Updated:**	FY 10/26/2011
PI Name:	Davis, Catherine M. Ph.D.		
Project Title:	Mitigating Neurobehavioral Vulnerabilities to Space Radiation		
Division Name:	Human Research		
Program/Discipline:	NSBRI		
Program/Discipline--Element/Subdiscipline:	NSBRI--Neurobehavioral and Psychosocial Factors Team		
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	(1) **BHP**:Behavioral Health & Performance (archival in 2017)		
Human Research Program Risks:	(1) **BMed**:Risk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
PI Email:	catherine.davis-takacs@usuhs.edu	**Fax:**	FY 301-400-4023
PI Organization Type:	NON-PROFIT	**Phone:**	301-295-5826
Organization Name:	Henry M. Jackson Foundation		
PI Address 1:	6720-A Rockledge Dr.		
PI Address 2:			
PI Web Page:			
City:	Bethesda	**State:**	MD
Zip Code:	20817-1891	**Congressional District:**	8
Comments:	Campus address (Jan 2022): Department of Pharmacology and Molecular Therapeutics, Uniformed Services University of the Health Sciences, 4301 Jones Bridge Road, Bethesda, MD 20814. NOTE: PI formerly at Johns Hopkins University; moved to Henry M. Jackson Foundation for the Advancement of Military Medicine in fall 2020.		
Project Type:	GROUND	**Solicitation / Funding Source:**	2011 NSBRI-RFA-11-01 Postdoctoral Fellowships
Start Date:	11/01/2011	**End Date:**	10/31/2013
No. of Post Docs:	1	**No. of PhD Degrees:**	
No. of PhD Candidates:		**No. of Master' Degrees:**	
No. of Master's Candidates:		**No. of Bachelor's Degrees:**	
No. of Bachelor's Candidates:		**Monitoring Center:**	NSBRI
Contact Monitor:		**Contact Phone:**	
Contact Email:			
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Hienz, Robert (MENTOR/ Johns Hopkins University)		
Grant/Contract No.:	NCC 9-58-PF02602		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	POSTDOCTORAL FELLOWSHIP Assessing the biological consequences of living in the space radiation environment represents one of the highest priority areas of NASA research. Of critical importance is the need for an assessment of the vulnerabilities of the central nervous system (CNS) leading to functional neurobehavioral changes during long-term space missions, and the development of effective countermeasures to such risks. The present proposal addresses this need via the application of an animal model to determine: 1) The long-term effects of radiation exposure on cognitive neurobehavioral function and the dopamine neurotransmitter system; and 2) The effectiveness of flaxseed dietary supplementation to mitigate the neurobehavioral and neurochemical effects of radiation exposure. To assess the likelihood of space radiation producing long-term functional changes in the CNS, neurobehavioral functions will be measured in rodents via an animal test analogous to 'vigilance' tests in humans. Cognitive neurobehavioral functions relevant to astronaut mission performance effectiveness will be assessed with a rodent analog of the Psychomotor Vigilance Test (PVT) currently used in space analog environments and by astronauts aboard the International Space Station. Neurobehavioral functions to be examined include assessments of general motor function and speed, vigilance, memory, inhibitory control ('impulsivity'), timing, motivation and basic sensory function. Groups of animals with inherent differences in dopamine system function will be trained on the rodent version of the PVT, following which they will be exposed to radiation and then re-tested periodically for up to five months post-exposure to assess potential performance deficits. Separate groups of animals will be given an experimental diet supplemented with flaxseed and will undergo the same behavioral testing using the rPVT. Likely mechanisms of damage to the CNS following radiation exposure and flaxseed treatment will be examined using Western blotting of proteins relevant to neurotransmitter function and inflammation.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2012.
Bibliography Type:	Description: (Last Updated: 10/27/2023)