Fiscal Year:	FY 2008	**Task Last Updated:**	FY 06/02/2008
PI Name:	Hienz, Robert D. Ph.D.		
Project Title:	Detection & Prevention of Neurobehavioral Vulnerability 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		
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City:	Baltimore	**State:**	MD
Zip Code:	21224-6823	**Congressional District:**	7
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	2007 Crew Health NNJ07ZSA002N
Start Date:	05/01/2008	**End Date:**	04/30/2012
No. of Post Docs:		**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):	Weed, Michael (Johns Hopkins University)		
Grant/Contract No.:	NCC 9-58-NBPF01604		
Performance Goal No.:			
Performance Goal Text:			

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.
This project addresses this need via the application of a comprehensive animal model to determine the effects of radiation exposure on a range of neurobehavioral functions and the likely mechanisms of damage to the CNS following radiation exposure (e.g., radiation-induced changes in neurotransmitter system function).

Specific Aims

1) To assess the likelihood of space radiation producing immediate and/or long-term functional changes in the CNS, neurobehavioral functions will be measured in rodents via animal tests analogous to the human Cambridge

Task Description:	Neuropsychological Test Automated Battery (CANTAB); 2) To cover a range of human neurobehavioral functions relevant to astronaut mission performance effectiveness, performance measures will include assessments of general motor function and speed, fine motor control, discrimination accuracy, inhibitory control (impulsivity), timing, short-term memory, spatial working memory, motivation, and basic sensory function. Groups of animals will be separately trained on each of these tasks, following which they will be exposed to radiation and then immediately re-tested as well as re-tested periodically for up to 18 months post-exposure to assess potential long-term performance deficits; and 3) To determine likely mechanisms of damage to the CNS following radiation exposure, pre-radiation and post-radiation pharmacologic assessments of the integrity of the relevant neurotransmitter systems will be conducted, as well as autoradiographic analyses of the integrity of different neurotransmitter systems.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2008.
Bibliography Type:	Description: (Last Updated: 01/12/2021)