Fiscal Year:	FY 2012	**Task Last Updated:**	FY 07/18/2012
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		
PI Email:	bhienz@jhmi.edu	**Fax:**	FY 410-550-2780
PI Organization Type:	UNIVERSITY	**Phone:**	410-550-2788
Organization Name:	The Johns Hopkins University School of Medicine		
PI Address 1:	Department of Psychiatry & Behavioral Sciences		
PI Address 2:	5510 Nathan Shock Drive		
PI Web Page:			
City:	Baltimore	**State:**	MD
Zip Code:	21224-6823	**Congressional District:**	7
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	2011 Crew Health NNJ11ZSA002NA
Start Date:	06/01/2012	**End Date:**	05/31/2015
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:	NOTE: End date change to 5/31/2015 per NSBRI (Ed., 8/23/2012)		
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Roma, Peter (Institutes for Behavior Resources, Inc.)		
Grant/Contract No.:	NCC 9-58-NBPF02802		
Performance Goal No.:			
Performance Goal Text:			
Task Description:	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 innovative animal model to determine 1) the long-term effects of radiation exposure on cognitive neurobehavioral function; and 2) the likely mechanisms of damage to the CNS following radiation exposure (e.g., radiation-induced changes in neurotransmitter system function). To assess the likelihood of space radiation producing long-term functional changes in the CNS, neurobehavioral functions will be measured in rodents via animal tests analogous to human '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 ISS. Neurobehavioral functions to be examined include assessments of general motor function and speed, vigilance, inhibitory control ('impulsivity'), timing, motivation, and basic sensory function. Groups of animals 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 18 months post-exposure to assess potential long-term performance deficits. Likely mechanisms of damage to the CNS following radiation exposure will be examined via pre-radiation behavioral pharmacology studies as well as post-radiation behavioral pharmacology studies and neurochemical assessments (Western blots) 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: 01/12/2021)