Fiscal Year:	FY 2011	**Task Last Updated:**	FY 07/15/2011
PI Name:	Rabin, Bernard M. Ph.D.		
Project Title:	Individual Differences in the Neurochemical and Behavioral Response to Exposure to Protons		
Division Name:	Human Research		
Program/Discipline:	HUMAN RESEARCH		
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Radiation health		
Joint Agency Name:	**TechPort:**		No
Human Research Program Elements:	(1) **SR**:Space Radiation		
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:	rabin@umbc.edu	**Fax:**	FY (410) 455-1055
PI Organization Type:	UNIVERSITY	**Phone:**	(410) 952-1761
Organization Name:	University of Maryland, Baltimore County		
PI Address 1:	Department of Psychology		
PI Address 2:	1000 Hilltop Cir		
PI Web Page:			
City:	Baltimore	**State:**	MD
Zip Code:	21250-0001	**Congressional District:**	7
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	2007 Space Radiation NNJ07ZSA001N
Start Date:	05/18/2008	**End Date:**	01/31/2013
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:**	4
No. of Bachelor's Candidates:	3	**Monitoring Center:**	NASA JSC
Contact Monitor:	Cucinott1a, Francis	**Contact Phone:**	281-483-0968
Contact Email:	nspcess@nasa.gov		
Flight Program:			
Flight Assignment:	NOTE: new end date is 1/31/2013 (previoulsy 5/17/2012) per NSSC information (Ed., 12/21/2011) NOTE: new end date is 5/17/2012 per NSSC information (Ed., 5/31/2011)		
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Shukitt-Hale, Barbara (USDA, HNRCA)		
Grant/Contract No.:	NNX08AM66G		
Performance Goal No.:			
Performance Goal Text:			
Task Description:	Long-term exploratory class missions will increase the risk that astronauts will be exposed to significant doses of protons resulting from solar flares. Evaluating these risks requires knowledge of the potential effects of proton irradiation on a variety of endpoints, including central nervous system (CNS) functioning. However, the effects of exposure to protons on CNS function and on behavior have not been the subject of significant amounts of research. Limited research has produced equivocal results about the consequences of exposure to protons on neurochemical and behavioral endpoints, with some data suggesting an effect of exposure to protons on these endpoints and other data indicating no effect following exposure. The objectives of the experiments detailed in this proposal are to describe and evaluate the effects of exposure to protons on CNS function and behavior and to characterize the role of individual differences, such as gender and age, in modulating the effects of exposure on neurocognitive endpoints.		
Rationale for HRP Directed Research:			
Research Impact/Earth Benefits:			
Task Progress:	The key findings are: 1. Age may be a risk factor for the behavioral effects of exposure to heavy particles and the effects are not necessarily linear. However it is possible that exposure to low LET particles such as 16O, in contrast to high LET 56Fe particles, may not produce an age-dependent performance decrement. 2. Exposure to gamma rays, 137Cs, does not produce significant changes in cognitive performance. 3. Exposure to 16O particles disrupts autophagy, the process by which the nervous system remove toxic proteins. It is possible that the disruption of this process contributes to the development of deficits in cognitive performance.		
Bibliography Type:	Description: (Last Updated: 10/16/2023)		
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