Fiscal Year:	FY 2020	Task Last Updated:	FY 11/15/2019
PI Name:	Ronca, April Elizabeth Ph.D.		
Project Title:	VNSCOR: Oxidative Stress and the Neuroconsequences of Spaceflight Environment		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline Element/Subdiscipline:			
Joint Agency Name:	Те	chPort:	No
Human Research Program Elements:	(1) HFBP:Human Factors & Behavioral Performance	ce (IRP Rev H)	
Human Research Program Risks:	 (1) BMed:Risk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders (2) Sensorimotor:Risk of Altered Sensorimotor/Vestibular Function Impacting Critical Mission Tasks 		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
PI Email:	april.e.ronca-1@nasa.gov	Fax:	FY
PI Organization Type:	NASA CENTER	Phone:	650.400.6019
Organization Name:	NASA Ames Research Center		
PI Address 1:	Space Biosciences Research Branch		
PI Address 2:	MS 261		
PI Web Page:			
City:	Moffett Field	State:	CA
Zip Code:	94035	Congressional District:	18
Comments:	November 2019: PI is located at NASA Ames Rese School of Medicine	arch Center and remains a	affiliated with Wake Forest University
Project Type:	GROUND	Solicitation / Funding Source:	2018 HERO 80JSC018N0001-Crew Health and Performance (FLAGSHIP, OMNIBUS). Appendix A-Flagship, Appendix B-Omnibus
Start Date:	10/01/2019	End Date:	09/30/2023
No. of Post Docs:		No. of PhD Degrees:	
No. of PhD Candidates:	1	No. of Master' Degrees:	
No. of Master's Candidates:		No. of Bachelor's Degrees:	
No. of Bachelor's Candidates:		Monitoring Center:	NASA JSC
Contact Monitor:	Williams, Thomas	Contact Phone:	281-483-8773
Contact Email:	thomas.j.will1@nasa.gov		
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:	Update as per PI: Ruth Globus, Ph.D. and Sharmila (Ed., 5/26/22).	Bhattacharya, Ph.D. left	the project before the investigation began
COI Name (Institution):	Tahimic, Candice Ph.D. (NASA Ames Research Center) Paul, Amber Ph.D. (NASA Ames Research Center) Mhatre, Siddhita Ph.D. (NASA Ames Research Center) Iyer, Janani Ph.D. (NASA Ames Research Center) Guttmann, Linda Ph.D. (NASA Ames Research Center) Globus, Ruth Ph.D. (NASA Ames Research Center) Bhattacharya, Sharmila Ph.D. (NASA Ames Research Center)		
Grant/Contract No.:	Internal Project		
Performance Goal No.:			

Performance Goal Text:

Task Description:	The proposed project will test the hypothesis that Ionizing Radiation (IR), microgravity, and social isolation combine synergistically to trigger an oxidative stress response that alters immune homeostasis, brain structure and function, and neurobehavioral and cognitive performance. Specific Aims for this project are: (1) Determine dose-responses in crew age-matched adult male and female mice; (2) Determine effects of acute 'Five-Ion GCR Simulation' exposure singly and in combination with simulated microgravity and social isolation, on immune, brain, and performance responses in crew age-matched male and female mice minicking deep space missions; and (3) Determine efficacy of the dietary antioxidant, Nicotinamide Mononucleotide (NMN), a key intermediate in nicotinamide adenine dinucleotide (NAD+) biosynthesis. The project relies on established and highly translatable ground-based mouse models and assays with IR exposures to be performed at the NASA Space Radiation Laboratory (NSRL). The experimental approach will provide definitive data on the timing and mechanisms involved in the oxidative stress response, immune, and brain changes, and ensuing functional (behavioral/cognitive) impairments expected during human transit to Mars. This project will identify potential immune biomarkers for, and mechanisms underlying, structural and functional changes in the immune and nervous systems leading to behavioral/cognitive performance deficits, and its potential application to develop effective countermeasures to mitigate negative health affects of long duration space habitation. This projecal addresses NASA's efforts to rapidly advance the characterization of risks and identifying appropriate countermeasures. Further, despite historically low numbers of females astronauts, the two most recent NASA Astronaut Corps class selections, compired of 50% and 40% women as compared to men, signal the need to understand how sex and gender differences affect physiological adaptation and health in the space environment. This integrat
Rationale for HRP Directed Research	:
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2020.
Bibliography Type:	Description: (Last Updated: 09/08/2023)