

Fiscal Year:	FY 2019	Task Last Updated:	FY 06/25/2019
PI Name:	Zhang, Quan Ph.D.		
Project Title:	Characterizing the Baselines of Sleep Quality, Cognitive / Operational Performance, Immune Function, and Intracranial Fluids for Deep Space Expeditions		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline-- Element/Subdiscipline:			
Joint Agency Name:		TechPort:	No
Human Research Program Elements:	(1) HFBP :Human Factors & Behavioral Performance (IRP Rev H)		
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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Zip Code:	02129-2020	Congressional District:	7
Comments:			
Project Type:	FLIGHT	Solicitation / Funding Source:	2017-2018 HERO 80JSC017N0001-BPBA Topics in Biological, Physiological, and Behavioral Adaptations to Spaceflight. Appendix C
Start Date:	04/22/2019	End Date:	05/31/2026
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:	NASA JSC
Contact Monitor:	Williams, Thomas	Contact Phone:	281-483-8773
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Flight Program:			
Flight Assignment:	NOTE: End date changed to 05/31/2026 per NSSC information (Ed., 2/3/2020) NOTE: End date changed to 9/30/2020 per NSSC information (Ed., 2/3/2020)		
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Kimberly, William M.D., Ph.D. (Massachusetts General Hospital) Vujovic, Nina Ph.D. (Brigham And Women's Hospital, Inc.) Spielmann, Guillaume Ph.D. (Louisiana State University and A&M College)		
Grant/Contract No.:	80NSSC19K0925		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	Sleep is central physiological regulator of cognitive / behavioral, neurophysiological, and immune functions. Therefore, study of sleep quality and duration on orbit may yield important insights into etiology and mechanisms of adverse cognitive/behavioral, Spaceflight Associated Neuro-ocular Syndrome (SANS), and immunological responses during long duration deep space exploration missions. We therefore propose to use an integrated approach combining assessments of (1) sleep quality and duration, (2) intracranial fluids distribution, (3) cognitive performance, (4) immunological response, and (5) changes in these physiological measures relative to sleep quality and duration. We propose to collect data on crewmembers participating in integrated one-year mission project (iYMP) aboard the International Space Station (ISS), and demographically matched control subjects in Human Exploration Research Analog (HERA) for missions of similar durations. We will achieve the proposed goals through these specific aims: Aim 1) Characterize cognitive task performance changes during the integrated 1 Year Mission Project on the ISS; Aim 2) Characterize brain and systemic physiology changes during 1YMP on the ISS; Aim 3) Characterize the effects of sleep duration and quality on cerebral hemodynamics on ISS and in HERA; and Aim 4) Quantify the effects of sleep duration and quality on immune response. The outcomes of the study will contribute to quantification of crew health and performance risks associated with human spaceflight, and aid in development of technologies for monitoring and mitigating crew health and performance.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2019.
Bibliography Type:	Description: (Last Updated: 04/12/2022)