Fiscal Year:	FY 2019	**Task Last Updated:**	FY 03/29/2019
PI Name:	Bailey, Susan M. Ph.D.		
Project Title:	Telomeres and the One Year Mission Project		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:			
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	(1) **SR**:Space Radiation		
Human Research Program Risks:	(1) **Cardiovascular**:Risk of Cardiovascular Adaptations Contributing to Adverse Mission Performance and Health Outcomes		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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Organization Name:	Colorado State University		
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PI Web Page:			
City:	Fort Collins	**State:**	CO
Zip Code:	80523-1618	**Congressional District:**	2
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:	01/31/2019	**End Date:**	01/30/2026
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:	Simonsen, Lisa	**Contact Phone:**	
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Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Jeevarajan, Antony Ph.D. (NASA Johnson Space Center)		
Grant/Contract No.:	80NSSC19K0434		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	The ultimate goal of the studies proposed here is to establish temporal profiles of human telomere length dynamics and DNA damage responses of importance for maintenance of human health and performance during long-duration deep space missions. We hypothesize that telomere length dynamics (changes over time) represent a particularly relevant and informative biomarker of health for the astronauts, as it reflects the combined experiences and exposures encountered during spaceflight. That is, an astronaut's individual genetic susceptibilities, unique lifestyle stresses encountered (e.g., nutritional, psychological, physical), and particular environmental exposures (e.g., microgravity, galactic cosmic rays) are all integrated and captured as changes in telomere length. Thus, the rate at which telomeres shorten provides a general measure of health that can be linked to aging, as well as to risk of developing degenerative age-related pathologies, ranging from reduced immune function and dementia, to cardiovascular disease and cancer. Importantly, functional telomeres are also essential for maintaining genomic integrity and stability, as they protect chromosomal termini from inappropriate degradation, and prevent these natural DNA ends from being recognized as broken DNA and triggering inappropriate DNA damage responses (DDRs). To identify trends in adaptations to human health and performance during long-duration low-Earth orbit, we propose telomere length and DDR/cytogenetic measures pioneered and validated in the NASA Twins Study/first One Year Mission, across the Integrated One-Year Mission Project onboard the International Space Station and the concurrent ground analog (prolonged isolation) component.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2019.
Bibliography Type:	Description: (Last Updated: 01/29/2024)