Fiscal Year:	FY 2023	**Task Last Updated:**	FY 06/13/2023
PI Name:	Allaway, Heather Ph.D.		
Project Title:	Insights Into the Impacts of Continuous, Low Dose-Rate Neutron Radiation Exposure on Maternal and Fetal Skeletal Physiology		
Division Name:	Space Biology		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:			
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	None		
Human Research Program Risks:	None		
Space Biology Element:	(1) Animal Biology: Vertebrate		
Space Biology Cross-Element Discipline:	(1) Musculoskeletal Biology		
Space Biology Special Category:	None		
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Zip Code:	70803-0001	**Congressional District:**	6
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	2021 Space Biology NNH21ZDA001N-SBAS E.11: Animal Studies
Start Date:	06/01/2023	**End Date:**	05/31/2024
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 ARC
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Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Lau, Anthony Ph.D. (College of New Jersey)		
Grant/Contract No.:	80NSSC23K0784		
Performance Goal No.:			
Performance Goal Text:			
Task Description:	The combined effects of space environmental stressors induce pathologies in multiple organ systems. Specifically, losses to the musculoskeletal system may be very dangerous for the health and performance of astronauts on extended duration missions on the Moon or arriving on Mars. A critical need remains to better understand the impact of radiation exposure, one of the key environmental stressors of deep space, on human and animal physiology to enable extended duration missions beyond low Earth orbit or setting up settlements on the Moon or Mars. There is a critical gap in knowledge surrounding the impact of the space radiation environment on skeletal health and on the progress of fetal skeletal development during pregnancy. The objective of the current proposal is to capitalize on a unique tissue-sharing opportunity to examine the combined effects of continuous radiation exposure and pregnancy on maternal and fetal skeletal physiology. We propose to assess maternal and fetal skeletal physiology through measurements of mineral and		

	material properties, as well as assess changes in cellular dynamics of the maternal bone under the microscope. This study will be critical in assessing how a very harmful component of the space radiation environment impacts multiple aspects of skeletal health, including sex-specific differences and individual variation in the impact of the space environment on the functioning of the body.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2023.
Bibliography Type:	Description: (Last Updated: 05/15/2024)