

Fiscal Year:	FY 2020	Task Last Updated: FY 10/22/2020	
PI Name:	Sekyi, Maria Ph.D.		
Project Title:	Microgravity and Partial Gravity Effects on Hepatic Organoid Steatosis and Function		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:	TRISH--TRISH		
Joint Agency Name:		TechPort:	No
Human Research Program Elements:	None		
Human Research Program Risks:	None		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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City:	San Francisco	State:	CA
Zip Code:	94143-2205	Congressional District:	12
Comments:			
Project Type:	Ground	Solicitation / Funding Source:	2020 TRISH-RFA-2001-PD: Translational Research Institute for Space Health (TRISH) Postdoctoral Fellowships
Start Date:	08/01/2020	End Date:	09/30/2021
No. of Post Docs:	1	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:	TRISH
Contact Monitor:		Contact Phone:	
Contact Email:			
Flight Program:			
Flight Assignment:	NOTE: End date changed to 9/30/2021 per TRISH (Ed., 11/3/21) NOTE: End date changed to 7/31/2022 (originally 7/31/2021) per TRISH (Ed., 11/2/20)		
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Chang, Tammy M.D., Ph.D. (MENTOR: University of California, San Francisco)		
Grant/Contract No.:	NNX16AO69A-P0505		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	<p>POSTDOCTORAL FELLOWSHIP</p> <p>Increasing evidence suggests that microgravity may induce detrimental effects on liver function, a serious risk for humans undertaking space exploration. To investigate this possibility, we propose the assessment of liver organoid response to microgravity and partial gravity conditions. Liver organoids are three-dimensional aggregates of hepatocyte, endothelial, and mesenchymal stem cells commonly used as a model for liver function and organogenesis. Through the use of histology to investigate cellular morphology, enzyme-linked immunosorbent assays for quantification of secreted proteins, and RNA-sequencing to evaluate changes in gene expression, we will quantify organoid response to up to 15 days of culture under altered gravitational conditions. Other readouts will include stress response to glucose or acetaminophen overdose. The proposed research is significant to the Translational Research Institute for Space Health (TRISH) and NASA's interests in establishing a sustained human presence on the Moon and Mars because it will define the hepatic health risks associated with microgravity during space exploration. As maintaining liver health is integral to maintaining human health, characterization of the effect of the gravitational perturbation on liver function and metabolism is crucial to the progression of these endeavors.</p>
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2020.
Bibliography Type:	Description: (Last Updated: 02/04/2022)