Fiscal Year:	FY 2019	**Task Last Updated:**	FY 10/03/2019
PI Name:	Jimenez, Miguel Ph.D.		
Project Title:	In Situ Expression Analysis of Therapeutic Microbes with Gastrointestinal Devices		
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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Zip Code:	02142-1019	**Congressional District:**	7
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	2019 TRISH RFA-1901-PD Translational Research Institute for Space Health (TRISH) Postdoctoral Fellowships
Start Date:	08/01/2019	**End Date:**	07/31/2021
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:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Langer, Robert Sc.D. (Mentor: Massachusetts Institute of Technology)		
Grant/Contract No.:	NNX16AO69A-P0401		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	POSTDOCTORAL FELLOWSHIP Genetically engineered therapeutic microbes (synthetic microbes) represent a promising approach to modulating the gut microbiome and enhancing human health. In particular, this new therapeutic modality has the potential to mitigate several risks defined by the Human Research Program, such as restricted pharmacy resources, altered astronaut immune response, inadequate nutrition, host-microorganism interactions, and adverse cognitive disorders. Ingested synthetic microbes provide the opportunity to carry out therapeutic and prophylactic functions on-demand, directly in the gut while minimizing personnel, equipment, and space requirements beyond those for food supply. However, there are two major challenges to implementing synthetic microbes in humans: stable, long-term delivery or administration, and effective genetic parts that function in the gut. This proposal focuses on overcoming the latter challenge. In this proposed work, we hypothesize that gastrointestinal (GI) polymeric devices can be used to uncover GI location-specific genetic promoters. If successful, this work will generate a reference toolbox of genetic parts that can be used by the field to develop effective interventions based on genetically engineered microbes. The specific aims of this proposal are (1) to develop a device that can stably localize microbes in the GI tract and (2) to deploy this device in swine to profile the set of microbial genes that are expressed and repressed in each GI location.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2019.
Bibliography Type:	Description: (Last Updated: 09/04/2023)