Fiscal Year:	FY 2019	**Task Last Updated:**	FY 04/10/2024
PI Name:	Zenhausern, Frederic Ph.D.		
Project Title:	Development of a Vertical Flow Paper-based Platform (VFP) for Monitoring Health Outcomes in Inflight Condition		
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		
PI Email:	fzenhaus@email.arizona.edu	**Fax:**	FY
PI Organization Type:	UNIVERSITY	**Phone:**	
Organization Name:	University of Arizona College of Medicine		
PI Address 1:	Center for Applied NanoBioscience and Medicine		
PI Address 2:	475 N 5th Street		
PI Web Page:			
City:	Phoeniz	**State:**	AZ
Zip Code:	85004	**Congressional District:**	7
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	TRISH--Synergy
Start Date:	05/01/2018	**End Date:**	04/30/2019
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:**	TRISH
Contact Monitor:		**Contact Phone:**	
Contact Email:			
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Porada, Christopher Ph.D. (Wake Forest University School of Medicine)		
Grant/Contract No.:	NNX16AO69A-SYN0003		
Performance Goal No.:			
Performance Goal Text:			
Task Description:	Synergy Project This project will design and characterize a novel Vertical Flow Paper-based Platform (VFP) built within a miniaturized “syringe-like” cartridge that will perform multiplexed detection of bio-agents and up to hundreds of biomarkers in small or large volumes of bodily fluids suitable for diagnosis in long space travel condition. This project will study bacterial agents (e.g., gut bacteria or other environmental exposure on the International Space Station-ISS), and also nucleic acid detection in order to develop a hybrid platform able to multiplex different types of biomarkers for enabling the diagnosis of multiple conditions. This is a synergy project with TRISH-funded Wake Forest University's project ("Novel Microfluidic Biomarker Detection Platforms to Monitor In Vivo Effects of Solar Particle Events and Galactic Cosmic Rays Radiation, Using Mice with Human Hematopoietic Systems ") by Principal Investigator (PI) Christopher Porada, Ph.D.		

Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	This project developed a platform able to measure the expression level of several genes at the same time. Interestingly, this platform, using vertical flow-based technology, provides new insights towards the development of a new point-of care technology to measure, simultaneously, expression of multiple biomarkers using an automated portable device integrating sample preparation, detection, and data analysis. Because of the miniaturization and potential automation, the platform will be suitable for the space environment: it limits weight and size into the space vehicle and provides a user-friendly interface for the crew without requiring any time-consuming training. With the exception of the use of small membranes, this platform does not contain solid single-use consumables and will be fully reusable in order to minimize supplies and waste in space. Our detection platform will use very small volumes of whole blood, but could also be ultimately used to quantify biomarkers in any types of biofluids such as urine, saliva, or sweat.
Bibliography Type:	Description: (Last Updated: 04/10/2024)
Awards	Zenhausern F. "Special Prize Recipient, Funds Carlo of the Philanthropia Foundation, Geneva (Switzerland), for work on development of in vitro methods." Dec-2018