Fiscal Year:	FY 2012	**Task Last Updated:**	FY 12/14/2011
PI Name:	Simpson, Richard Ph.D.		
Project Title:	Effects of Long-Term Exposure to Microgravity on Salivary Markers of Innate Immunity		
Division Name:	Human Research		
Program/Discipline:	HUMAN RESEARCH		
Program/Discipline--Element/Subdiscipline:			
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	(1) **HHC**:Human Health Countermeasures		
Human Research Program Risks:	(1) **Immune**:Risk of Adverse Health Event Due to Altered Immune Response (IRP Rev F)		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
PI Email:	rjsimpson@email.arizona.edu	**Fax:**	FY
PI Organization Type:	UNIVERSITY	**Phone:**	713-397-0121
Organization Name:	University of Arizona		
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PI Web Page:			
City:	Tucson	**State:**	AZ
Zip Code:	85721-0001	**Congressional District:**	3
Comments:	NOTE: Formerly at University of Houston until September 2017 move to University of Arizona.		
Project Type:	GROUND	**Solicitation / Funding Source:**	2010 Crew Health NNJ10ZSA003N
Start Date:	11/03/2011	**End Date:**	11/02/2015
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:	Baumann, David	**Contact Phone:**	
Contact Email:	david.k.baumann@nasa.gov		
Flight Program:	ISS		
Flight Assignment:	ISS Flight Definition phase		
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Clarke, Mark (University of Houston) Crucian, Brian (Wyle Laboratories, Inc.) Lowder, Thomas (University of Houston) O'Connor, Dan (University of Houston) Pierson, Duane (NASA Johnson Space Center)		
Grant/Contract No.:	NNX12AB48G		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	Immune system dysregulation has been documented during and after spaceflight, but it is not known if these changes increase infection susceptibility or pose a significant health risk to crewmembers. Inherent problems with current in-flight research are small sample sizes and the difficulty to control for the many confounding factors that impact on the immune system. As such, it is not known if changes in immunity are due to the microgravity environment per se, or to the stressors associated with landing and re-adaptation to the 1G environment. The present project proposes a Flight Definition investigation, utilizing a longitudinal repeated measures design to determine the effects of long-term exposure to microgravity on a host of salivary antimicrobial proteins (AMPs) associated with innate host immune defense, whilst also considering the impact of other acute stressors such as launch, Soyuz landing and EVA. Saliva samples will be collected from crewmembers selected for ISS mission and ground-based controls at bi-weekly intervals for 6 months prior to flight, during the 6-month period on the ISS and for 1 month on return to Earth. Saliva sampling was selected because it is an excellent biological fluid with which to detect broad-spectrum biomarkers of front-line host immune defense and is suitable for the spaceflight environment. Attempts will also be made to establish relationships between AMPs and other stressors associated with spaceflight (i.e. mood state disturbances, circadian desynchronization, sleep loss/disruption, stress biomarkers) using serial data. Finally, blood samples will be collected before and after the mission to determine the impact of spaceflight on cellular aspects of innate immunity. Given the potential of salivary AMPs to serve as an indicator of weakened immunity during spaceflight, this project will serve as a foundation for future countermeasure developments and technological advances to detect real time changes during subsequent lunar or Mars missions.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	0
Task Progress:	New project for FY2012.
Bibliography Type:	Description: (Last Updated: 08/04/2021)