Fiscal Year:	FY 2017	**Task Last Updated:**	FY 02/07/2017
PI Name:	Spielmann, Guillaume Ph.D.		
Project Title:	The Impact of Long Duration Spaceflight on the Function of B-cells and Biomarkers of Inflammation		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Biomedical countermeasures		
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		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
PI Email:	Gspielmann@lsu.edu	**Fax:**	FY
PI Organization Type:	UNIVERSITY	**Phone:**	225-578-2926
Organization Name:	Louisiana State University		
PI Address 1:	112 Long Fieldhouse		
PI Address 2:	School of Kinesiology		
PI Web Page:			
City:	Baton Rouge	**State:**	LA
Zip Code:	70803-0001	**Congressional District:**	6
Comments:			
Project Type:	FLIGHT	**Solicitation / Funding Source:**	2015-16 HERO NNJ15ZSA001N-Crew Health (FLAGSHIP, NSBRI, OMNIBUS). Appendix A-Crew Health, Appendix B-NSBRI, Appendix C-Omnibus
Start Date:	11/01/2016	**End Date:**	10/31/2017
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:	Norsk, Peter	**Contact Phone:**	
Contact Email:	Peter.norsk@nasa.gov		
Flight Program:	ISS		
Flight Assignment:	Postflight sample analysis		
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Campbell, John Ph.D. (Louisiana State University and A&M College) Crucian, Brian Ph.D. (NASA Johnson Space Center) Laughlin, Mitzi Ph.D. (University of Houston) Simpson, Richard Ph.D. (University of Houston)		
Grant/Contract No.:	NNX17AB16G		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	Long duration spaceflights have been associated with profound dysregulation of the immune system and latent viral reactivations, which could jeopardize crew safety and mission success. Although the clinical implications of such immune disruption have remained limited to mostly asymptomatic events, extending mission duration would increase crewmember's risk for infection. Furthermore, the dearth of information regarding the impact of long duration spaceflight on humoral immunity and overall B-cell function, raises legitimate concerns on crewmembers' ability to fight infections during a mission. It is therefore critical to extend the current knowledge on spaceflight-induced immune changes of B-cell function in order to evaluate the risks of crew adverse health events for successful implementation of future exploration-class missions. In this regard, recent scientific projects entitled "Salivary Markers" and "Integrated Immune" examined the impact of long duration spaceflight on markers of adaptive and innate immunity, but did not characterize humoral immunity and serological markers of B-cell function. The present project proposes to retrospectively analyze archived plasma and saliva samples from the aforementioned studies in order to evaluate B-cell function during and following long-duration missions. We will address the paucity of spaceflight data on B-cells by characterizing acute and chronic changes in polyclonal Free Light Chains and in Immunoglobulin class switching, indicative of a state of chronic inflammation and overall B-cell function. We will also assess if changes to these sensitive biomarkers are associated with altered risk of viral re-activation and subsequent inflammation. All assays will be performed on plasma and saliva samples previously collected from crewmembers throughout several International Space Station (ISS) missions, which will allow the studies described in this proposal to make a significant contribution to the "Salivary Markers" and "Integrated Immune" studies without the costs associated with classical flight-definition studies. On conclusion to this study we expect to have a better understanding of B-cell function during orbital flights which is essential to identify any clinical risks that may arise due to altered immunity during long-duration spaceflight missions.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2017.
Bibliography Type:	Description: (Last Updated: 02/03/2020)