Fiscal Year:	FY 2006	**Task Last Updated:**	FY 04/25/2007
PI Name:	Stowe, Raymond Ph.D.		
Project Title:	Space Flight-Induced Reactivation of Latent Epstein-Barr Virus		
Division Name:	Human Research		
Program/Discipline:	HUMAN RESEARCH		
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Operational and clinical research		
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:	rpstowe@microgenlabs.com, brian.crucian-1@nasa.gov	**Fax:**	FY 409-935-6705
PI Organization Type:	INDUSTRY	**Phone:**	409-935-6700
Organization Name:	Microgen		
PI Address 1:	903 Texas Avenue		
PI Address 2:			
PI Web Page:			
City:	La Marque	**State:**	TX
Zip Code:	77568-3318	**Congressional District:**	22
Comments:			
Project Type:	FLIGHT	**Solicitation / Funding Source:**	98-HEDS-02
Start Date:	07/01/2004	**End Date:**	12/31/2008
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:**	NASA JSC
Contact Monitor:	McCollum, Suzanne	**Contact Phone:**	281 483-7307
Contact Email:	suzanne.g.mccollum@nasa.gov		
Flight Program:	Shuttle/ISS		
Flight Assignment:	STS-108, -109, -110, -111, -113, -114; ISS-5, -6 In flight development phase (data collection has begun)		
Key Personnel Changes/Previous PI:	Raymond Stowe replaced Alan Barrett as PI, effective July 2004 (per info from S. McCollum/M. Anderson, 12/2006). See also Barrett for FY02-04 information/reports.		
COI Name (Institution):	Pierson, Duane L (NASA Johnson Space Center)		
Grant/Contract No.:	NNJ06HB73A		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	The majority of humans are infected with Epstein-Barr virus (EBV) early in life and thereafter carry the virus in a latent form. Reactivation of latent EBV may be an important threat to crew health during extended space missions. EBV is the causative agent of infectious mononucleosis as well as nasopharyngeal carcinoma, Burkitt's lymphoma, and different kinds of B-lymphocyte lymphomas in immunosuppressed individuals. Control of replication in vivo is mediated primarily by EBV- specific cytotoxic T-lymphocytes, and severe clinical symptoms have been associated with reactivation of latent viruses in patients with defective cellular immunity. Decreased cellular immune function has been reported both during and after space flight. Preliminary studies have demonstrated increased EBV shedding in saliva as well as increased antibody titers to EBV lytic proteins. Based on these observations, we hypothesize that the combined effects of microgravity along with associated physical and psychological stress will decrease EBV-specific T-cell immunity and reactivate latent EBV in infected B- lymphocytes. The specific aims to test this hypothesis are: (1) determine if antibody titers to EBV-specific antigens are increased after space flight; (2) determine T-lymphocyte immunocompetence using a EBV-specific autologous T-cell killing assay; (3) characterize the viral burden and gene expression in peripheral blood cells using PCR/RT-PCR; and (4) measure stress hormones in plasma and urine. To determine the mechanisms underlying altered virus-specific T cell immunity and reactivation of latent EBV in B lymphocytes.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	This experiment will address fundamental questions on spaceflight and virus-specific immunity. One potential concern is the development of a virally associated disease or lymphoma within an infected individual. In addition, reinfection or transmission to a previously uninfected individual (resulting in primary infection) may be another concern. Thus, spaceflight may result in an increased frequency and/or severity of both primary and reactivated disease. If increased reactivation and clonal expansion of infected B- lymphocytes is detected, then pharmacological measures can be developed and instituted prior to onset of overt clinical disease.
Task Progress:	See FY2007 report.
Bibliography Type:	Description: (Last Updated: 03/07/2019)