Fiscal Year: FY 2013  
Task Last Updated: FY 02/04/2014  
PI Name: Platts, Steven H. Ph.D.  
Project Title: Effects of Long Duration Spaceflight on Venous and Arterial Compliance in Astronauts  
Division Name: Human Research  
Program/Discipline:  
Program/Discipline--Element/Subdiscipline: NSBRI--Cardiovascular Alterations Team  
Joint Agency Name:  
TechPort: No  
Human Research Program Elements:  
(1) HHC: Human Health Countermeasures  
Human Research Program Risks:  
(1) SANS: Risk of Spaceflight Associated Neuro-ocular Syndrome (IRP Rev I)  
Space Biology Element: None  
Space Biology Cross-Element Discipline: None  
Space Biology Special Category: None  
PI Email: steven.platts-1@nasa.gov  
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PI Organization Type: NASA CENTER  
Organization Name: NASA Johnson Space Center  
PI Address 1: Cardiovascular Laboratory  
PI Address 2: Biomedical Research and Environmental Sciences Division  
PI Web Page:  
City: Houston  
State: TX  
Zip Code: 77058  
Congressional District: 36  
Comments:  
Project Type: FLIGHT, GROUND  
Solicitation: 2012 Crew Health NNJ12ZSA002N  
Start Date: 06/01/2013  
End Date: 05/31/2016  
No. of Post Docs:  
No. of PhD Degrees:  
No. of PhD Candidates:  
No. of Master's Degrees:  
No. of Master's Candidates:  
No. of Bachelor's Degrees:  
No. of Bachelor's Candidates:  
Contact Monitor:  
Monitoring Center: NSBRI  
Contact Email:  
Flight Program: Pre/Post Flight  
Flight Assignment: ISS pre- and postflight  
Key Personnel Changes/Previous PI:  
COI Name (Institution): Lee, Stuart (Wyle Laboratories, Inc.)  
Martin, David (Wyle Laboratories, Inc.)  
Ploutz-Snyder, Robert (Universities Space Research Association)  
Stenger, Michael (Wyle Laboratories, Inc.)  
Westby, Christian (Universities Space Research Association)  
Grant/Contract No.: NCC 9-58-CA03402  
Performance Goal No.:  
Performance Goal Text: Visual impairment and intracranial pressure (VIIP) is a newly described space flight-associated medical condition made
Visual impairment and intracranial pressure (VIIP) is a newly described space flight-associated medical condition made up of a constellation of symptoms affecting at least 20% of American astronauts who have flown on ISS missions (#6 months). VIIP is defined primarily by visual acuity deficits and anatomical changes to eye structures. It has been hypothesized that the cephalad fluid shifts which occur with the loss of hydrostatic gradients are likely the primary contributor to the development of the syndrome. However, the presentation of the syndrome is similar to the terrestrial equivalent diagnosis of idiopathic intracranial hypertension (IIH) which includes elevated intracranial pressure (ICP).

Loss of visual acuity is a significant threat to crew health and performance and may carry implications for years post-flight. It is therefore important to understand the pathogenesis of VIIP. The studies presented here will investigate the relationship between changes in vascular compliance and development of the VIIP syndrome in long duration spaceflight, and is relevant to 1) the solicitation NNJ12ZSA002N, Section III.A.2.a and 2) the Human Research Program Integrated Research Plan (July 2011 Revision C) 2.3.3.2 Risk of Microgravity-Induced Visual Impairment/Intracranial Pressure; specifically Gap VIIP6: How do changes in vascular compliance/pressures influence intraocular pressure or intracranial pressure?, and IRP Gap VIIP2: Does exposure to microgravity cause changes in visual acuity, intraocular pressure and/or intracranial pressure? Are the effects related to mission duration? Additionally, this research has the potential to inform medical practice on possible mechanisms for pathologies related to increased intracranial/intraocular pressure (e.g. idiopathic intracranial hypertension).

### Rationale for HRP Directed Research:

**Research Impact/Earth Benefits:**

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### Task Progress:

New project for FY2013.

### Bibliography Type:

Description: (Last Updated: 03/01/2018)