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| **Fiscal Year:** | FY 2012 | **Task Last Updated:** | FY 08/30/2011 |
| **PI Name:** | Platts, Steven H. Ph.D. | | |
| **Project Title:** | Defining the relation between biomarkers of oxidative and inflammatory stress and atherosclerosis risk in astronauts during and after long-duration spaceflight | | |
| **Division Name:** | Human Research | | |
| **Program/Discipline:** | HUMAN RESEARCH | | |
| **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:** | None | | |
| **Space Biology Element:** | None | | |
| **Space Biology Cross-Element Discipline:** | None | | |
| **Space Biology Special Category:** | None | | |
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| **PI Organization Type:** | NASA CENTER | **Phone:** | 281-483-8177 |
| **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 | **Solicitation / Funding Source:** | 2010 Crew Health NNJ10ZSA003N |
| **Start Date:** | 10/01/2011 | **End Date:** | 09/30/2015 |
| **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:** | |
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| **Flight Program:** | ISS | | |
| **Flight Assignment:** | ISS | | |
| **Key Personnel Changes/Previous PI:** | | | |
| **COI Name (Institution):** | Lee, Stuart ( Wyle Laboratories, Inc. )<br>Ploutz-Snyder, Robert ( Universities Space Research Association )<br>Smith, Scott ( NASA Johnson Space Center )<br>Stenger, Michael ( Wyle Laboratories, Inc. )<br>Westby, Christian ( Universities Space Research Association ) | | |
| **Grant/Contract No.:** | Internal Project | | |
| **Performance Goal No.:** | | | |
| **Performance Goal Text:** | | | |

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| **Task Description:** | Atherosclerosis is the major contributor to cardiovascular disease-related morbidity and mortality. Research indicates that many of the risk factors commonly associated with atherosclerosis contribute to endothelial dysfunction, a process which presents early in life before angiographic evidence of disease and precedes the clinical manifestation of many cardiovascular disease-related disorders. In an effort to compensate for the initial risk factor-related disruptions to homeostasis, there is a compensatory upregulation of atheroprotective mechanisms. However, in the absence of appropriate risk factor management, these defense mechanisms may become overwhelmed and less able to reestablish normal function. Key systems that help maintain vascular homeostasis, and are susceptible to differential deleterious alterations, include those that help balance levels of oxidative and inflammatory stress. New evidence suggests that long duration spaceflight may promote oxidative and inflammatory stress through mechanisms such as radiation exposure, diet, physical inactivity, and psychological stress. However, there are no data supporting a causal link between biomarkers of oxidative and inflammatory stress and indices of vascular endothelial dysfunction in space flight. As such, we propose to examine the relation between biomarkers of oxidative and inflammatory stress and well established measures of vascular endothelial dysfunction (flow mediated dilation (FMD) and carotid intima-media thickness (CIMT)), in astronauts before, during, and after long duration spaceflight. |
| **Rationale for HRP Directed Research:** | |
| **Research Impact/Earth Benefits:** | |
| **Task Progress:** | New project for FY2012. |
| **Bibliography Type:** | Description: (Last Updated: 03/01/2018) |