Task Book Report Generated on: 03/29/2024

Fixed Years: FY 2014 Task Law Updated: FY 0508/2014 Project Title: Space Biochemistry Profile Division Name: Human Research Program/Discipline: HUMAN RESEARCH Program/Discipline: HUMAN RESEARCH Program/Discipline: HUMAN RESEARCH Human Research Program Elements: (1) HIMCI Journal Health Countermeasures Human Research Program Elements: (1) HIMCI Journal Health Countermeasures Human Research Program Risks: (1) HIMCI Journal Health Countermeasures Human Research Program Risks: (1) HIMCI Journal Health Countermeasures Human Research Program Risks: (1) HIMCI Journal Health Countermeasures Human Research Program Risks: (1) HIMCI Journal Health Countermeasures Human Research Program Risks: (1) HIMCI Journal Health Countermeasures Human Research Program Risks: (1) HIMCI Journal Health Countermeasures Human Research Program Risks: (1) Human Risks of Remail Stone Fermation Space Biology Element: None Space Biology Element: None Space Biology Element: None Space Biology Special Category: None PI Email: Research Research Research and Environmental Sciences Division/SK3 PI Todarics I: Biomedical Research and Environmental Sciences Division/SK3 PI Address I: Biomedical Research and Environmental Sciences Division/SK3 PI Address I: Biomedical Research and Environmental Sciences Division/SK3 PI Address I: Biomedical Research and Environmental Sciences Division/SK3 PI Address I: Biomedical Research and Environmental Sciences Division/SK3 PI Address I: Research and Environ				
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Space Biology Cross-Element Discipline: Space Biology Special Category: None PI Email: Space Biology Special Category: None PI Email: Scottm.smith@nass.gov Fax: FY 281-483-2888 Pl Organization Type: NASA Center NASA Johnson Space Center PI Address 1: Biomedical Research and Environmental Sciences Division/SK3 PI Address 2: 2101 NASA Pkwy PI Web Page: City: Houston State: TX Zip Code: 77058-3607 Congressional District: Solicitation / Funding: Source: Project Type: FLIGHT Solicitation / Funding: Source: No. of Post Docs: No. of Post Docs: No. of PhD Degrees: No. of Master' Candidates: No. of Bachelor's Candidates: No. of Bachelor's Candidates: No. of Bachelor's Candidates: No. of Bachelor's Candidates: No. of Master' Degrees: No. of Master' Degrees: No. of Master' Degrees: No. of Master' Degrees: No. of Master' Candidates: No. of Master' Degrees: No. of Bachelor's Candidates: No. of Master' Degrees: No. of Master' De	Human Research Program Risks:	 (2) Food and Nutrition: Risk of Performance Decrement and Crew Illness Due to Inadequate Food and Nutrition (3) Immune: Risk of Adverse Health Event Due to Altered Immune Response (4) Nutrition: Risk of Inadequate Nutrition (5) Osteo: Risk Of Early Onset Osteoporosis Due To Spaceflight 		
Discipline: Space Biology Special Category: None PI Email: Scott.m.smith@masa.gov Fax: FY 281-483-2888 PI Organization Type: NASA CENTER Phone: 281-483-7204 Organization Name: NASA Johnson Space Center PI Address 1: Biomedical Research and Environmental Sciences Division/SK3 PI Address 2: 2101 NASA Pkwy PI Web Page: City: Houston State: TX Zip Code: 77058-3607 Congressional District: 36 Comments: Project Type: FLIGHT Solicitation / Funding Solicitation / S	Space Biology Element:	None		
PI Email: scott.m.smith/dinasa.gov Fax: FY 281-483-2888 PI Organization Type: NASA CENTER Phone: 281-483-7204 Organization Name: NASA Johnson Space Center PI Address 1: Biomedical Research and Environmental Sciences Division/SK3 PI Address 2: 2101 NASA Pkwy PI Web Page: City: Houston State: TX Zip Code: 77058-3607 Congressional District: 36 Comments: Project Type: FLIGHT Solicitation / Funding Source: 2012 Crew Health NNJ12ZSA002N Start Date: 08/01/2013 End Date: 07/31/2020 No. of Post Docs: No. of PhD Degrees: No. of PhD Candidates: No. of Master's Candidates: No. of Master' Degrees: No. of Bachelor's Candidates: No. of Bachelor's Degrees: No. of Bachelor's Candidates: Norsk, Peter Contact Monitoric Norsk, Peter Contact Email: Peter Aorsk@nasa.gov Flight Program: ISS Flight Assignment: Key Personnel Changes/Previous PI: Martina Heer is a Co-I on this project. COI Name (Institution): Liternal Project Performance Goal No:		None		
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Task Book Report Generated on: 03/29/2024

As long-duration spaceflights continue and the operational suite of countermeasures is modified, the food system is updated, and the duration of missions lengthens, it will be important to evaluate and monitor a broad set of biomarkers for key physiological systems. The Nutritional Status Assessment Supplemental Medical Objective (aka "Nutrition SMO") was initiated in 2006, and has yielded significant clinical, operational, and research data. This proposal aims to extend the Nutrition SMO, under the guidelines provided in the NRA. Nutrition SMO data have been used to help identify or explain medical, scientific, and even engineering issues that have occurred during or after International Space Station missions. The data have been used by Medical Operations on multiple occasions, to confirm the effectiveness of vitamin D supplementation, to test for nutrient toxicities (secondary to supplement use), to evaluate blood and urine chemistries after instances of kidney stones and gout symptoms in crewmembers, and to evaluate the effects of using a **Task Description:** new exercise device on bone and calcium metabolism. The ISS Program Office has used these data to determine factors contributing to the Urine Processor Assembly failure and to make forward operational decisions. Perhaps most striking, the data provided evidence that one-carbon metabolism may be altered in crewmembers who experienced vision changes post flight, the highest Human Research Program risk. The relationship between nutritional status and 1-carbon metabolism would likely never have been discovered if the Nutrition SMO was not being conducted. The impact of the data collected to date provide a strong rationale for continuing with an updated version of this protocol, eliminating some tests while expanding others, to provide a repository of data to other scientific Disciplines. We have extensive experience with these types of analyses, sample and data management, transfer to data archives, and data reduction for medical, management, and research purposes. Rationale for HRP Directed Research: The findings from this study will help us better understand physiological adaptation to space flight, and will help evaluate countermeasure effectiveness. These results will also inform the general, medical, and scientific communities on human health and physiological issues in an altered gravity environment. There could be significant potential Research Impact/Earth Benefits: implications of these findings. Sample collection protocols have been well executed on orbit, with the first subjects completing planned activities earlier **Task Progress:** this year, with others in process. The first sample return is planned for May 2014 on SpaceX-3. Description: (Last Updated: 05/24/2023) **Bibliography Type:**