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| Fiscal Year: | FY 2017 | Task Last Updated: | FY 01/11/2018 |
| PI Name: | Seidler, Rachael D. Ph.D. | | |
| Project Title: | Bed Rest Combined with 0.5% CO2 as a Spaceflight Analog to Study Neurocognitive Changes: Extent, Longevity, and Neural Bases | | |
| Division Name: | Human Research | | |
| Program/Discipline: | | | |
| Program/Discipline--Element/Subdiscipline: | HUMAN RESEARCH--Behavior and performance | | |
| Joint Agency Name: | TechPort: | No | |
| Human Research Program Elements: | (1) HFBP :Human Factors & Behavioral Performance (IRP Rev H) | | |
| Human Research Program Risks: | (1) BMed :Risk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders (2) Sensorimotor :Risk of Altered Sensorimotor/Vestibular Function Impacting Critical Mission Tasks | | |
| Space Biology Element: | None | | |
| Space Biology Cross-Element Discipline: | None | | |
| Space Biology Special Category: | None | | |
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| Organization Name: | University of Florida | | |
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| Comments: | NOTE: PI moved to University of Florida in July 2017; previous affiliation was University of Michigan. | | |
| Project Type: | GROUND | Solicitation / Funding Source: | 2014-15 HERO NNJ14ZSA001N-MIXEDTOPICS. Appendix E: Behavioral Health & Human Health Countermeasures Topics |
| Start Date: | 06/29/2017 | End Date: | 06/28/2019 |
| 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: | Williams, Thomas | Contact Phone: | 281-483-8773 |
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| Flight Program: | | | |
| Flight Assignment: | | | |
| Key Personnel Changes/Previous PI: | | | |
| COI Name (Institution): | Bloomberg, Jacob Ph.D. (NASA Johnson Space Center) Mulavara, Ajitkumar Ph.D. (Universities Space Research Association) Kuehn, Simone Ph.D. (Max Planck Institute for Human Development) Stahn, Alexander Ph.D. (University of Pennsylvania) | | |
| Grant/Contract No.: | 80NSSC17K0021 | | |
| Performance Goal No.: | | | |
| Performance Goal Text: | | | |

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| Task Description: | NRA NNJ14ZSA001N-MIXEDTOPICS requests proposals in the area of “Risk Characterization and Monitoring of Behavioral Health and Performance Relevant Outcomes” to determine the effects of 30 days head down tilt bed rest in a 0.5% CO2 environment on neurobehavioral signs and symptoms, neurostructural and neurofunctional alterations, and changes in cognitive function and operational task performance. Our Neuromapping studies measure precisely these metrics in a flight study and a 70 days head down tilt bed rest study under normative conditions. Here, our overarching goal is to quantify neurocognitive changes and associated neural structural and functional alterations occurring as a result of a 30 days head down tilt bed rest plus 0.5% CO2 environment, serving as a spaceflight analog exposure. We will identify the relationship between these neural changes and behavioral function. Our approach utilizes cutting edge neuroimaging techniques and a broad ranging battery of sensory, motor, and cognitive assessments to investigate neuroplastic and maladaptive brain changes occurring in a spaceflight analog environment. Success in this endeavor would 1) result in identification of the underlying neural mechanisms and operational risks of changes in behavior with a spaceflight analog, and 2) identify whether a return to normative behavioral function following bed rest is associated with a restitution of brain structure and function or instead is supported by substitution with compensatory brain processes. Moreover, addition of a CO2 group will enable us to parse out the multiple mechanisms contributing to any spaceflight induced neural structural and behavioral changes that we observe in our ongoing flight projects ((NASA flight project, Seidler Principal Investigator (PI); ILSRA flight study, Stahn PI)), and comparison with our recently completed bed rest projects (Seidler and Stahn, PIs) will allow us to delineate brain and behavioral changes occurring with long term exposure to slightly elevated CO2 levels. |
| Rationale for HRP Directed Research: | |
| Research Impact/Earth Benefits: | |
| Task Progress: | New project for FY2017. |
| Bibliography Type: | Description: (Last Updated: 01/24/2024) |
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