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Task Description:	Lighting protocols have been recognized by NSBRI, NASA, and NIH as important countermeasures for circadian rhythm and sleep disruptions and their associated effects on performance and alertness for both crews in space and workers on Earth. The current light-based countermeasures involve one or more hours of bright light exposure. We have recently demonstrated significant circadian phase shifting with an ultra-short 2-minute bright light stimulus. The use of such a short duration stimulus as a countermeasure would significantly preserve the ability to work in the ISS lighting environment and reduce crew resource requirements. We propose to test the relative efficacy of both ultra-short and longer-duration light protocol countermeasures using the newly approved ISS lighting system to induce both adaptive circadian resetting and direct alerting effects. The inpatient experiments will involve healthy volunteers whose circadian thythms and subjective and objective performance and alertness will be studied before, during and after 2-minute or longer exposures to ISS lighting modes. Objective alertness and performance, an operational task-specific measure developed by NSBRI investigators. These studies will further our understanding of the physiologic mechanisms that mediate exposure-duration-dependent and wavelength-dependent effects of photic stimuli on circadian phase and performance. Furthermore, results from these experiments will be added to our validated mathematical models: (i) a model of the effects of light on the human circadian pacemaker, (ii) a linked model of circatian phase and length-of-time awake on objective performance and subjective alertness, as well as for poople experiencing jet lag. The proposed work directly addresses one of the NSBRI NRA research objectives and two NASA Human Research Program IRP Risks. This proposal will also address other NSBRI goals: training of future scientist, collaboration among NSBRI investigators, and a combination of basic science with space-based applications and p
Rationale for HRP Directed Research	:
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2012.
Bibliography Type:	Description: (Last Updated: 06/25/2025)