

<b>Fiscal Year:</b>	FY 2008	<b>Task Last Updated:</b>	FY 06/02/2008
<b>PI Name:</b>	Dinges, David F. Ph.D.		
<b>Project Title:</b>	Countermeasures for Performance Deficits from Sleep Loss and Workload in Space Flight		
<b>Division Name:</b>	Human Research		
<b>Program/Discipline:</b>	NSBRI		
<b>Program/Discipline--Element/Subdiscipline:</b>	NSBRI--Human Factors and Performance Team		
<b>Joint Agency Name:</b>		<b>TechPort:</b>	No
<b>Human Research Program Elements:</b>	(1) <b>BHP</b> :Behavioral Health & Performance (archival in 2017)		
<b>Human Research Program Risks:</b>	(1) <b>BMed</b> :Risk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders (2) <b>Sleep</b> :Risk of Performance Decrements and Adverse Health Outcomes Resulting from Sleep Loss, Circadian Desynchronization, and Work Overload		
<b>Space Biology Element:</b>	None		
<b>Space Biology Cross-Element Discipline:</b>	None		
<b>Space Biology Special Category:</b>	None		
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<b>Zip Code:</b>	19104-4209	<b>Congressional District:</b>	2
<b>Comments:</b>			
<b>Project Type:</b>	GROUND	<b>Solicitation / Funding Source:</b>	2007 Crew Health NNJ07ZSA002N
<b>Start Date:</b>	06/01/2008	<b>End Date:</b>	05/31/2012
<b>No. of Post Docs:</b>		<b>No. of PhD Degrees:</b>	
<b>No. of PhD Candidates:</b>		<b>No. of Master' Degrees:</b>	
<b>No. of Master's Candidates:</b>		<b>No. of Bachelor's Degrees:</b>	
<b>No. of Bachelor's Candidates:</b>		<b>Monitoring Center:</b>	NSBRI
<b>Contact Monitor:</b>		<b>Contact Phone:</b>	
<b>Contact Email:</b>			
<b>Flight Program:</b>			
<b>Flight Assignment:</b>			
<b>Key Personnel Changes/Previous PI:</b>			
<b>COI Name (Institution):</b>	Goel, Namni ( University of Pennsylvania School of Medicine ) Banks, Siobhan ( University of Pennsylvania School of Medicine )		
<b>Grant/Contract No.:</b>	NCC 9-58-HFP01602		
<b>Performance Goal No.:</b>			
<b>Performance Goal Text:</b>			

<b>Task Description:</b>	<p>To be able to carry out mission-critical tasks at any time during a mission, astronauts must maintain a high level of performance in the face of demanding workloads and work-rest schedules that result in chronic sleep restriction. This project will use a laboratory-based study to acquire critically-needed information on the effects on performance of high cognitive workload and sleep restriction (Specific Aim 1). We will test the hypothesis that as sleep restriction accumulates, it will potentiate the performance-impairing effects of higher cognitive workload.</p> <p>Another key goal of the study is to provide astronauts with an objective way to identify performance changes and the need for countermeasures for fatigue from sleep restriction and high workload. To this end, the project will complete validation of the sensitivity of the three-minute Psychomotor Vigilance Test (PVT) SelfTest to high workload and sleep restriction. PVT SelfTest feedback interfaces will also be evaluated, and the task will be tested in analog operations (e.g., NASA Extreme Environment Mission Operations - NEEMO) to establish its technical feasibility (Specific Aim 2).</p> <p>Tertiary goals of the project include identification of biobehavioral predictors of differential vulnerability to the cognitive effects of sleep restriction and high workload (Specific Aim 3), and development of individualized biomathematical models that predict performance on the PVT SelfTest during high workload (Specific Aim 4).</p> <p>The project has primary relevance to strategic goals of the NSBRI Human Factors and Performance Team. It addresses a high-priority gap identified by NASAs Small Assessment Team and Behavioral Health and Performance Program Element, and NSBRI Human Factors and Performance area. The project specifically targets questions 27 e, d, f, and g in the Bioastronautics Roadmap Risk 27 (Human Performance Failure Due to Sleep Loss and Circadian Rhythm Problems), questions 26 f, g, c, and h in Risk 26 (Mismatch between Crew Cognitive Capabilities and Task Demands), and question 25 d in Risk 25 (Human Performance Failure Due to Neurobehavioral Problems).</p>
<b>Rationale for HRP Directed Research:</b>	
<b>Research Impact/Earth Benefits:</b>	
<b>Task Progress:</b>	New project for FY2008.
<b>Bibliography Type:</b>	Description: (Last Updated: 04/24/2024)