

Fiscal Year:	FY 2011	Task Last Updated:	FY 05/21/2014
PI Name:	Winther, Sean B.S.		
Project Title:	Biosensors for Exploration Medical System (PI=Winther)		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline-- Element/Subdiscipline:			
Joint Agency Name:		TechPort:	Yes
Human Research Program Elements:	(1) ExMC :Exploration Medical Capabilities		
Human Research Program Risks:	(1) ExMC :Risk of Unacceptable Health and Mission Outcomes Due to Limitations of In-flight Medical Capabilities (IRP Rev E)		
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:	650-604-6091
Organization Name:	CSS-Dynamac/NASA Ames Research Center		
PI Address 1:	Code: SCF (Flight Systems Implementation)		
PI Address 2:	Biomedical Engineer		
PI Web Page:			
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Zip Code:	94035	Congressional District:	18
Comments:			
Project Type:	FLIGHT,GROUND	Solicitation / Funding Source:	Directed Research
Start Date:	07/01/2011	End Date:	06/30/2016
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:	Watkins, Sharmila	Contact Phone:	281.483.0395
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Flight Program:	ISS		
Flight Assignment:	NOTE: Project completed and transferred to Medical Operations; closeout as of 6/30/2016 (original end date was 9/30/2018) (Ed., 4/4/18)		
Key Personnel Changes/Previous PI:	NOTE: Original PI was Fritz Moore. Sean Winther took over the project in early 2014.		
COI Name (Institution):			
Grant/Contract No.:	Directed Research		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	<p>NOTE: Original PI was Fritz Moore. Sean Winther took over the project in early 2014.</p> <p>The current ISS ECG system for donning the biomedical sensors is time consuming and inconvenient, requiring shaving, application of electrodes, and signal checks. A more efficient ECG system will save crew time and reduce the overhead of stowing additional supplies. Additionally, the current ECG hardware requires dedicated ISS power and significant volume, but advances in microelectronics has significantly reduced the volume and power required for ECG applications. The Biosensors-EMSD will demonstrate the integration of small, battery powered, easy to use biomedical sensors and data acquisition devices that will have the ability to measure, store and transmit physiologic parameters during operational and ambulatory scenarios.</p> <p>Specific Aims:</p> <ol style="list-style-type: none"> 1. Demonstrate that commercial off the shelf (COTS) and emerging technologies satisfy exploration physiological monitoring requirements and operational requirements 2. Reduce the time required of an on-orbit crew and ground personnel to store, access, transfer, and process physiological data 3. Provide a mechanism for interfacing biomedical sensor technology with a common data management framework and architecture to enable the EMSD objectives. <p>The functionality of the ECG system will be verified through a ground demonstration and an ISS flight demonstration, both as part of the Exploration Medical System Demonstration. The project will begin with a market survey of available COTS ECG systems that meet physiological monitoring requirements followed by a direct COTS procurement. The ECG system will then be tested and verified for proper capabilities by CMO analogs. Ground testing will require CMO analogs to don the ECG system and execute a series of predetermined tasks while a variety of ECG data and video is collected. ECG data and video will be examined to ensure data quality, appropriate data routing, and to demonstrate system efficiency. Flight testing will be similar to ground testing, but may not be as comprehensive given in-flight resource limitations. The availability of more varied medical condition simulations, more extensive supply of power, fewer time and space limitations, and enhanced system characterization capabilities will allow the ground demonstration to expand the on-orbit objectives by assessing system effectiveness and performance.</p>
Rationale for HRP Directed Research:	<p>The study team is uniquely positioned to perform this function because the physiological monitoring requirements and operational requirements needed for this task require specialized information that is unique to NASA. The study team will also help ensure that the ECG component of the overall Exploration Medical System Demonstration (EMSD) is well integrated with other components of the system.</p>
Research Impact/Earth Benefits:	0
Task Progress:	<p>New project for FY2011. NOTE: Task added to Task Book when received information in August 2013; in May 2014, received information of PI change to Sean Winther from Fritz Moore. No previous reporting.</p>
Bibliography Type:	Description: (Last Updated:)