Fiscal Year:	FY 2014	**Task Last Updated:**	FY 10/13/2014
PI Name:	de Lemos, James Andrew M.D.		
Project Title:	Improving Cardiovascular Risk Prediction		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:	NSBRI--Cardiovascular Alterations Team		
Joint Agency Name:		**TechPort:**	Yes
Human Research Program Elements:	(1) **ExMC**:Exploration Medical Capabilities		
Human Research Program Risks:	(1) **Cardiovascular**:Risk of Cardiovascular Adaptations Contributing to Adverse Mission Performance and Health Outcomes (2) **Medical Conditions**:Risk of Adverse Health Outcomes and Decrements in Performance Due to Medical Conditions that occur in Mission, as well as Long Term Health Outcomes Due to Mission Exposures		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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Zip Code:	75390	**Congressional District:**	30
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	2013 HERO NNJ13ZSA002N-Crew Health (FLAGSHIP & NSBRI)
Start Date:	06/01/2014	**End Date:**	05/31/2017
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:**	NSBRI
Contact Monitor:		**Contact Phone:**	
Contact Email:			
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Levine, Benjamin M.D. (University of Texas Southwestern Medical Center at Dallas) Ballantyne, Christie M.D. (Baylor College of Medicine) Berry, Jarett M.D. (University of Texas Southwestern Medical Center at Dallas) Hundley, Wade M.D. (Wake Forest Health Center) Khera, Amit M.D. (University of Texas Southwestern Medical Center at Dallas) Wang, Thomas M.D. (Vanderbilt University)		
Grant/Contract No.:	NCC 9-58-CA03801		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	The most likely cause of a non-traumatic life- or mission-threatening medical event in astronauts would be from acute cardiovascular disease (CVD). Current risk prediction models utilize only traditional atherosclerosis risk factors and focus narrowly on coronary heart disease events rather than global cardiovascular risk, ignoring outcomes such as heart failure or atrial fibrillation that could also be potentially mission-threatening. Numerous studies have evaluated novel risk markers in an attempt to improve CVD risk prediction, with several promising imaging and blood-based biomarkers identified. Most of these studies have investigated the incremental predictive value of a single biomarker added to a traditional risk factor model, with a few reporting combinations of biomarkers. Moreover, few studies have evaluated strategies for risk prediction that cross testing modalities. Such a multi-modality approach has the potential to markedly improve CVD risk prediction among potential and existing astronauts, and would have direct relevance to the general population. Our primary objective is to develop a consortium of biomarker and aerospace medicine leaders, with expertise in multiple different testing modalities, and with access to robust existing databases, to identify and validate novel strategies to enhance global CVD risk prediction over two time windows: 1) 10-20 years, representing the full career of the astronaut and 2) 2-5 years, representing the planning and operational phase of a manned mission to Mars. The Biomarker Consortium will provide “real time” advice to NASA on the design of existing screening programs, the status of new biomarkers, and the interpretation of test results. The team of collaborative investigators will pool data from multiple existing cohort studies to develop two distinct multi-modality risk prediction tools, one based on 10-year global CVD risk and one based on 3-year CVD risk. These models will sequentially evaluate novel testing modalities on top of standard risk factors, including coronary calcium (a measure of the extent of coronary atherosclerosis), multiple blood based protein biomarkers that reflect inflammation, cardiac injury and cardiac stress, as well as imaging-based assessments of cardiac function. Finally, we will work directly with NASA researchers in the Human Research Program to explore the feasibility of transforming the Longitudinal Study of Astronaut Health into a prospective state-of-the-art cohort study of the astronaut corps. We will utilize the expertise of the Biomarker Consortium to design a novel program for study of the effects of training and spaceflight on astronaut health.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2014.
Bibliography Type:	Description: (Last Updated: 09/05/2020)