

<b>Fiscal Year:</b>	FY 2014	<b>Task Last Updated:</b>	FY 01/27/2014
<b>PI Name:</b>	McNiece, Ian Ph.D.		
<b>Project Title:</b>	The Effects of Space Radiation on Stem Cells and Vascular and Cardiac Disease		
<b>Division Name:</b>	Human Research		
<b>Program/Discipline:</b>	HUMAN RESEARCH		
<b>Program/Discipline--Element/Subdiscipline:</b>	HUMAN RESEARCH--Radiation health		
<b>Joint Agency Name:</b>	<b>TechPort:</b>	No	
<b>Human Research Program Elements:</b>	(1) <b>SR:</b> Space Radiation		
<b>Human Research Program Risks:</b>	(1) <b>Cardiovascular:</b> Risk of Cardiovascular Adaptations Contributing to Adverse Mission Performance and Health Outcomes		
<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>	77030-4009	<b>Congressional District:</b>	9
<b>Comments:</b>			
<b>Project Type:</b>	GROUND	<b>Solicitation / Funding Source:</b>	2010 Space Radiobiology NNJ10ZSA001N
<b>Start Date:</b>	01/23/2013	<b>End Date:</b>	10/31/2014
<b>No. of Post Docs:</b>	0	<b>No. of PhD Degrees:</b>	0
<b>No. of PhD Candidates:</b>	0	<b>No. of Master' Degrees:</b>	0
<b>No. of Master's Candidates:</b>	0	<b>No. of Bachelor's Degrees:</b>	0
<b>No. of Bachelor's Candidates:</b>	0	<b>Monitoring Center:</b>	NASA JSC
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<b>Flight Program:</b>			
<b>Flight Assignment:</b>	NOTE: End date changed to 10/31/2014 (original end date was 1/22/2014), per NSSC information (Ed., 9/23/14) NOTE: End date changed to 7/31/2014 (original end date was 1/22/2014), per NSSC information (Ed., 12/4/13)		
<b>Key Personnel Changes/Previous PI:</b>	None		
<b>COI Name (Institution):</b>	Gupta, Seema ( Biophysics Research Institute of America (BPRIA) ) Wu, Xiaodong ( Biophysics Research Institute of America (BPRIA) )		
<b>Grant/Contract No.:</b>	NNX13AF05G		
<b>Performance Goal No.:</b>			
<b>Performance Goal Text:</b>			

<b>Task Description:</b>	<p>The integrity of organs and tissues is maintained through continued cell production to replace damaged or senescent cells. In particular stem cells are pivotal to this process providing the primary source for production of functional cells. In the heart, cardiac stem cells (CSCs) reside in close proximity to stromal cells or mesenchymal stem cells (MSCs) that produce proteins that control the growth and development. Stem cells are quiescent cells that cycle through self replication very slowly. This decreases the ability of these cells to repair damage to DNA and may lead to increased risks of vascular and heart disease. In this application we will evaluate the effects of exposure of stem cells to spaceflight-relevant radiation.</p> <p>Methods: The methods to be used involve exposing stem cells to radiation and evaluating the performance of the stem cells in models of vascular and cardiac disease.</p> <p>Significance: These studies will provide insights into the potential of increased risks for vascular and cardiac disease due to radiation during spaceflight. The completion of this work will provide models of stem cell damage that can be used to define the underlying mechanisms and possible treatment.</p>
<b>Rationale for HRP Directed Research:</b>	
<b>Research Impact/Earth Benefits:</b>	The proposed studies will provide critical information on the effects of radiation on cardiac stem cells and cardiac derived stromal cells.
<b>Task Progress:</b>	The studies have been delayed. At present we are isolating and expanding our stem cell lines to initiate radiation experiments. We have scheduled time at Bookhaven for use of their facilities in the spring of 2014.
<b>Bibliography Type:</b>	Description: (Last Updated: )