Fiscal Year:	FY 2015	**Task Last Updated:**	FY 11/25/2014
PI Name:	Perera, Imara Y Ph.D.		
Project Title:	Transcriptional and Post Transcriptional Regulation of Seedling Development in Microgravity		
Division Name:	Space Biology		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:			
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	None		
Human Research Program Risks:	None		
Space Biology Element:	(1) Cell & Molecular Biology (2) Plant Biology		
Space Biology Cross-Element Discipline:	(1) Developmental Biology		
Space Biology Special Category:	None		
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Zip Code:	27695	**Congressional District:**	4
Comments:			
Project Type:	FLIGHT	**Solicitation / Funding Source:**	2014 Space Biology Flight NNH14ZTT001N
Start Date:	11/01/2014	**End Date:**	10/31/2017
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:**	NASA ARC
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Flight Program:	ISS		
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):			
Grant/Contract No.:	NNX15AB07G		
Performance Goal No.:			
Performance Goal Text:			
Task Description:	Plants are a vital part of human life support systems for long-duration space flight and habitation. However, the space environment is not optimal for plant growth. Plants grown in space are subject to many unfamiliar stresses (in addition to the lack of gravity) and recent transcriptional profiling studies indicate that there are global changes in gene expression between space and ground controls. Post transcriptional regulation of RNA is emerging as an important mechanism of modulating gene expression under different environmental conditions. To date however, there have been no studies to examine the role of small regulatory RNAs in plant responses to the space environment. We propose to examine the transcriptional and post transcriptional mechanisms that regulate early seedling development in space and microgravity. Our hypothesis is that plant adaptation and response to the space environment will involve novel regulatory small RNAs. Our previous flight experiment has revealed novel regulatory mechanisms and provides the foundation for further		

	investigation and the proposed research. The long term goals of this research are to understand the molecular mechanisms by which plants sense and adapt to changes in their environment and to characterize the regulatory networks that mediate these responses. This knowledge will be valuable for designing plants which are better able to withstand space flight, microgravity, and adverse environmental conditions. This project is in alignment with P2, one of the highest priority recommendations of the Space Biology Research focus on Plant and Microbial Biology as outlined in the Decadal Survey Report, “to analyze plant growth and physiological responses to the multiple stimuli encountered in space flight environments.”
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2015.
Bibliography Type:	Description: (Last Updated: 01/26/2024)