Fiscal Year:	FY 2018	**Task Last Updated:**	FY 11/21/2017
PI Name:	Nielsen, Sheila Ph.D.		
Project Title:	Characterizing the Effects of Spaceflight on the Candida albicans Adaptation Response		
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) Microbiology		
Space Biology Cross-Element Discipline:	(1) Reproductive Biology (2) Immunology		
Space Biology Special Category:	(1) Translational (Countermeasure) Potential		
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City:	Bozeman	**State:**	MT
Zip Code:	59717	**Congressional District:**	1
Comments:	PI name change to Sheila Nielsen in 2014 (formerly Sheila Nielsen-Preiss)--Ed., 1/12/2015		
Project Type:	FLIGHT	**Solicitation / Funding Source:**	2014 Space Biology Flight NNH14ZTT001N
Start Date:	11/01/2014	**End Date:**	04/30/2019
No. of Post Docs:	0	**No. of PhD Degrees:**	0
No. of PhD Candidates:	0	**No. of Master' Degrees:**	1
No. of Master's Candidates:	0	**No. of Bachelor's Degrees:**	2
No. of Bachelor's Candidates:	4	**Monitoring Center:**	NASA ARC
Contact Monitor:	Sato, Kevin	**Contact Phone:**	650-604-1104
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Flight Program:	ISS		
Flight Assignment:	NOTE: Extended to 4/30/2019 per F. Hernandez/ARC (Ed., 11/2/17) NOTE: End date changed to 10/31/2017 per NSSC information (Ed., 11/29/16)		
Key Personnel Changes/Previous PI:			
COI Name (Institution):			
Grant/Contract No.:	NNX15AB37G		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	The common yeast pathogen, Candida albicans, can cause a range of diseases from superficial skin infections to systemic and life threatening infections in immunocompromised individuals. Most members of the population are carriers of this yeast at some point in their lifetime. This point becomes more concerning for astronauts who experience diminished immune responsiveness during spaceflight. In addition, many bacteria have been shown to become more virulent when grown in space. The combination of increased virulence and diminished immunity can jeopardize the health and wellbeing of flight crew. The goal of these studies is to characterize the mechanisms underlying the adaptation responses we have observed in yeast grown in modeled microgravity and in spaceflight. In addition, we will focus on determining whether yeast also become more virulent when grown in space, as our observed cellular alterations might predict. Furthermore, we will define the environmental stressors that exist during spaceflight that influence yeast growth. Our overriding research goals are to characterize the virulence of Candida albicans in the space environment, to understand which aspects of the environment contribute to adaptive changes within the yeast, and to identify targets that might be exploited to control yeast infection in space and on Earth.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	There are low fluid shear environments within the human host so we hope to exploit the low fluid shear environment of microgravity to better understand the yeast adaptation to this physical force and the microenvironment created by it.
Task Progress:	In late 2015 and early 2016 it was announced that crew time was essentially unavailable. We could either convert our studies to ground-based only, or evaluate conditions by which the experiments could be held on station until crew had time to conduct them (likely in ‘down’ time between capsule dockings). We spent significant time performing storage studies--how long, what temperature, under what conditions, for our cells and reagents. In July 2016 I visited NASA Ames for our Kickoff meeting. There were no additional flight opportunities for awhile after that and we stood down waiting for next steps. Communication was reestablished in August 2017 and we are now preparing for a potential flight opportunity.
Bibliography Type:	Description: (Last Updated: 06/23/2023)