

<b>Fiscal Year:</b>	FY 2019	<b>Task Last Updated:</b>	FY 02/08/2019
<b>PI Name:</b>	Oubre, Cherie Ph.D.		
<b>Project Title:</b>	Culture-based Environmental Monitoring of Crop-based Space Food Systems		
<b>Division Name:</b>	Human Research		
<b>Program/Discipline:</b>			
<b>Program/Discipline-- Element/Subdiscipline:</b>			
<b>Joint Agency Name:</b>	<b>TechPort:</b>	No	
<b>Human Research Program Elements:</b>	(1) <b>HHC:</b> Human Health Countermeasures		
<b>Human Research Program Risks:</b>	(1) <b>Microhost:</b> Risk of Adverse Health Effects Due to Host-Microorganism Interactions		
<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>	77058	<b>Congressional District:</b>	36
<b>Comments:</b>			
<b>Project Type:</b>	FLIGHT	<b>Solicitation / Funding Source:</b>	Directed Research
<b>Start Date:</b>	12/17/2018	<b>End Date:</b>	10/30/2021
<b>No. of Post Docs:</b>	<b>No. of PhD Degrees:</b>		
<b>No. of PhD Candidates:</b>	<b>No. of Master' Degrees:</b>		
<b>No. of Master's Candidates:</b>	<b>No. of Bachelor's Degrees:</b>		
<b>No. of Bachelor's Candidates:</b>	<b>Monitoring Center:</b> NASA JSC		
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<b>Flight Program:</b>	ISS		
<b>Flight Assignment:</b>			
<b>Key Personnel Changes/Previous PI:</b>			
<b>COI Name (Institution):</b>	Ott, Mark Ph.D. ( NASA Johnson Space Center ) Castro, Victoria B.S. ( KBRwyle/NASA Johnson Space Center )		
<b>Grant/Contract No.:</b>	Directed Research		
<b>Performance Goal No.:</b>			
<b>Performance Goal Text:</b>	Crewmembers live and work in a closed-environment that is monitored to ensure health and safety. Lessons learned from microbial monitoring of previous spaceflight missions have been incorporated into the design and development of the International Space Station (ISS). The microbial control actions on the ISS include engineering designs, such as high efficiency particulate air (HEPA) filtering of the air, microbial monitoring of the air, surfaces, and water, as well as remediation procedures when needed. The continual monitoring of the microbes in the environment has given us a large set of microbial environmental data to use when evaluating the current spacecraft environmental microbial limits as well as monitoring the safety of the environment for the crew. As we move toward exploration missions, we are introducing new systems such as the Veggie plant growth system to enable mission success. It is important to collect similar measures on the new systems to give us data to develop the spaceflight-grown produce requirements. Sampling of the Veggie system over time will give us this data to assess the impact of the plant growth system on crew safety. The		

<b>Task Description:</b>	<p>Veggie system is open to the cabin environment, which makes it even more critical to understand what microbes are present in the plant growth system.</p> <p>The objective of this experiment is to characterize the microbial community of the Veggie plant growth system in order to identify a baseline of microorganisms that can be used to:</p> <ol style="list-style-type: none"><li>1. Develop microbial requirements for spaceflight-grown produce</li><li>2. Provide inputs to future plant growth system design</li></ol> <p>Future work will be continued evaluation of microorganisms that colonize the plant growth system using next generation monitoring technologies to develop future methods for evaluation of produce safety. Of note, the data collected in this study may be used to get a better understating of the sources of plant system contamination from the ISS environment, pre-flight hardware contamination, water/nutrient supply, plant growth matrix, and the seeds.</p>
<b>Rationale for HRP Directed Research:</b>	<p>The MicroHost research plan includes microbial evaluations of food systems and recommendations for spaceflight grown food requirements. Baseline microbial monitoring of the food systems will provide needed data for the development of the microbial requirements.</p> <p>This work can be considered as “highly constrained” since it takes advantage of the operational microbial sampling procedure that is already conducted monthly onboard the ISS, by adding swabbing of the hardware and growing plants and collection of water samples, identical in nature and taken at the same time as the operational sample collections. The highly applied and operational nature of this work makes solicitation or awarding to an external entity not feasible. The MicroHost and Food PRRs (Path to Risk Reduction) identify this work as starting in FY19, and it is preceded by the ground study “Produce Microbiology” (Principal Investigator R. Wheeler) which is underway at Kennedy Space Center and will be completed by the end of FY18, and a Microbial Risk Assessment study initiated in Early FY19. The findings from the characterization of the Veggie system will feed into the Microbial Risk Assessment effort and into the Microbial Requirements Development task, planned to begin in FY20.</p>
<b>Research Impact/Earth Benefits:</b>	
<b>Task Progress:</b>	New project for FY2019.
<b>Bibliography Type:</b>	Description: (Last Updated: )