

<b>Fiscal Year:</b>	FY 2015	<b>Task Last Updated:</b> FY 08/12/2015	
<b>PI Name:</b>	Massa, Gioia Ph.D.		
<b>Project Title:</b>	Pick-and-Eat Salad-Crop Productivity, Nutritional Value, and Acceptability to Supplement the ISS Food System		
<b>Division Name:</b>	Human Research, Space Biology		
<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>Food and Nutrition:</b> Risk of Performance Decrement and Crew Illness Due to Inadequate Food and Nutrition		
<b>Space Biology Element:</b>	(1) Plant Biology		
<b>Space Biology Cross-Element Discipline:</b>	None		
<b>Space Biology Special Category:</b>	(1) Bioregenerative Life Support		
<b>PI Email:</b>	<a href="mailto:gioia.massa@nasa.gov">gioia.massa@nasa.gov</a>	<b>Fax:</b>	FY
<b>PI Organization Type:</b>	NASA CENTER	<b>Phone:</b>	321-861-2938
<b>Organization Name:</b>	NASA Kennedy Space Center		
<b>PI Address 1:</b>	ISS Ground Processing and Research		
<b>PI Address 2:</b>	Mail Code UB-A-00		
<b>PI Web Page:</b>			
<b>City:</b>	Kennedy Space Center	<b>State:</b>	FL
<b>Zip Code:</b>	32899-0001	<b>Congressional District:</b>	8
<b>Comments:</b>			
<b>Project Type:</b>	FLIGHT	<b>Solicitation / Funding Source:</b>	2013-14 HERO NNJ13ZSA002N-ILSRA. International Life Sciences Research Announcement
<b>Start Date:</b>	09/01/2015	<b>End Date:</b>	08/31/2018
<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
<b>Contact Monitor:</b>	Douglas, Grace	<b>Contact Phone:</b>	
<b>Contact Email:</b>	<a href="mailto:grace.l.douglas@nasa.gov">grace.l.douglas@nasa.gov</a>		
<b>Flight Program:</b>	ISS		
<b>Flight Assignment:</b>	NOTE: Period of performance changed to 9/01/2015-8/31/2018 (previously 7/1/15-6/30/18) per G. Douglas/HRP (Ed., 4/3/16)		
<b>Key Personnel Changes/Previous PI:</b>			
<b>COI Name (Institution):</b>	Douglas, Grace Ph.D. ( NASA Johnson Space Center ) Hummerick, Mary M.S. ( Qinetiq North America, Inc. ) Mitchell, Cary Ph.D. ( Purdue University ) Morrow, Robert Ph.D. ( Orbital Technologies Corporation ) Ploutz-Snyder, Robert Ph.D. ( Universities Space Research Association ) Wheeler, Raymond Ph.D. ( NASA Kennedy Space Center ) Whitmire, Alexandra Ph.D. ( Wyle/NASA Johnson Space Center )		
<b>Grant/Contract No.:</b>	Internal Project		
<b>Performance Goal No.:</b>			
<b>Performance Goal Text:</b>			

Task Description:	<p>The capability to grow nutritious, palatable food for crew consumption during spaceflight has the potential to provide health promoting, bioavailable nutrients, enhance the dietary experience, and reduce launch mass as we move toward longer-duration missions. However, studies of edible produce during spaceflight have been limited, leaving a significant knowledge gap in the methods required to grow safe, acceptable, nutritious crops for consumption in microgravity. The “Veggie” vegetable-production system on the International Space Station (ISS) offers an opportunity to develop a “pick-and-eat” fresh vegetable component to the ISS food system as a first step to bioregenerative supplemental food production. We propose growing salad plants in the Veggie unit during spaceflight, focusing on the impact of light quality and fertilizer formulation on crop morphology, edible biomass yield, microbial food safety, organoleptic acceptability, nutritional value, and behavioral health benefits of the fresh produce. Phase A of the project would involve flight tests using leafy greens. Phase B would focus on dwarf tomato. Our work will help define light colors, levels, and horticultural best practices to achieve high yields of safe, nutritious leafy greens and tomatoes to supplement a space diet of prepackaged food. Our final deliverable will be the development of growth protocols for these crops in a spaceflight vegetable production system.</p> <p>Specific aim 1: Evaluate the effects of four light treatments and two different fertilizer compositions on the yield, morphology, organoleptic acceptability, and nutritional attributes of leafy greens during flight-definition and flight testing.</p> <p>Specific aim 2: Perform cultivar selection and evaluate the effects of four different red: blue light treatments and two different fertilizer compositions on the yield, morphology, organoleptic acceptability, and nutritional attributes of dwarf tomato during ground and flight tests.</p> <p>Specific aim 3: Perform hazard analysis, develop plans for minimizing microbial hazards, and screen flight-grown produce for potential pathogens.</p>
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2015.
Bibliography Type:	Description: (Last Updated: 10/26/2023)