

<b>Fiscal Year:</b>	FY 2007	<b>Task Last Updated:</b>	FY 11/27/2007
<b>PI Name:</b>	LeBlanc, Adrian Ph.D.		
<b>Project Title:</b>	Bisphosphonates as a Countermeasure to Space Flight Induced Bone Loss: SMO-021		
<b>Division Name:</b>	Human Research		
<b>Program/Discipline:</b>	HUMAN RESEARCH		
<b>Program/Discipline--Element/Subdiscipline:</b>	HUMAN RESEARCH--Biomedical countermeasures		
<b>Joint Agency Name:</b>	<b>TechPort:</b>	Yes	
<b>Human Research Program Elements:</b>	(1) <b>HHC</b> :Human Health Countermeasures		
<b>Human Research Program Risks:</b>	(1) <b>Osteo</b> :Risk Of Early Onset Osteoporosis Due To Spaceflight (No longer used, July 2020)		
<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>Organization Name:</b>	Universities Space Research Association		
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<b>Zip Code:</b>	77058	<b>Congressional District:</b>	22
<b>Comments:</b>			
<b>Project Type:</b>	FLIGHT	<b>Solicitation / Funding Source:</b>	Directed Research
<b>Start Date:</b>	10/01/2006	<b>End Date:</b>	09/30/2010
<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>		<b>Contact Phone:</b>	
<b>Contact Email:</b>			
<b>Flight Program:</b>	ISS		
<b>Flight Assignment:</b>	ISS 18, 19, 20		
<b>Key Personnel Changes/Previous PI:</b>	Toshio Matsumoto, M.D., Ph.D., is the Japanese Co-Principal Investigator of this study, a joint project between NASA and JAXA. Dr. Matsumoto is affiliated with the Department of Medicine and Regulatory Sciences, University of Tokushima Graduate School of Medicine. His contact information is: Phone 81-88-633-7119/Fax 81-88-633-7407; Toshimat@clin.med.tokushima-u.ac.jp .		
<b>COI Name (Institution):</b>	Jones, Jeffrey ( NASA Johnson Space Center ) Shapiro, Jay ( Kennedy Krieger Institute ) Lang, Tom ( University of California at San Francisco ) Kozlovskaya, Inessa ( Institute of Biomedical Problems ) Shackelford, Linda ( NASA Johnson Space Center ) Smith, Scott M. ( NASA Johnson Space Center ) Evans, Harlan ( Wyle Laboratories ) Spector, Elisabeth ( Wyle Laboratories ) Sibonga, Jean ( Universities Space Research Association (USRA) ) Nakamura, Toshitaka ( University of Occupational and Environmental Health ) Kohri, Kenjiro ( Nagoya City University ) Ohshima, Hiroshi ( Japan Aerospace Exploration Agency (JAXA) )		
<b>Grant/Contract No.:</b>			

<b>Performance Goal No.:</b>	
<b>Performance Goal Text:</b>	
<b>Task Description:</b>	<p>The purpose of this Supplementary Medical Objective is to determine whether bisphosphonates, in conjunction with the routine in-flight exercise program, will protect ISS crewmembers from the regional decreases in bone mineral density documented on previous ISS flights. Two dosing regimens will be tested: (1) an oral dose of 70 mg alendronate taken weekly during flight and (2) and I.V. dose of zoledronic acid 4 mg, administered just once approximately 45 days before flight. Our rationale for including both alendronate and zoledronic acid is that two dosing options will: maximize crew participation, increase the countermeasure options available to flight surgeons, increase scientific opportunities, and minimize the effects of operational and logistical constraints. Use of both oral and I.V. options can accommodate both crew and flight surgeon preferences (e.g., based on individual drug sensitivity, relevant health conditions, or other considerations). Operational and logistical constraints may favor one option versus the other. For example, stowage limits may limit use of alendronate on certain flights, while the ability to titrate the in-flight dose in response to on-orbit measurements of bone resorption would favor the weekly dosing regimen. Long-duration (e.g., 2+ year) missions would require in-flight re-dosing of I.V. zoledronic acid. The purpose of this study is not to test one dosing option versus the other. Rather, we intend to show that bisphosphonates-plus-exercise will have a measurable effect versus exercise alone in preventing space flight induced bone loss. Secondary goals will be to document the return to normal bone remodeling post-flight in crewmembers who took bisphosphonates.</p> <p>See also <a href="http://www.nasa.gov/">http://www.nasa.gov/</a></p>
<b>Rationale for HRP Directed Research:</b>	
<b>Research Impact/Earth Benefits:</b>	<p>While the primary purpose of this research is to develop a countermeasure to protect crewmembers against bone loss during long duration spaceflight, this research may provide insight into the mechanisms and prevention of bone atrophy in other disuse conditions.</p>
<b>Task Progress:</b>	<p>New project for FY2007.</p>
<b>Bibliography Type:</b>	<p>Description: (Last Updated: 10/15/2019)</p>