

<b>Fiscal Year:</b>	FY 2004	<b>Task Last Updated:</b>	FY 08/19/2005
<b>PI Name:</b>	Serrador, Jorge Manuel Ph.D.		
<b>Project Title:</b>	Vestibular-Cerebrovascular Interactions and Their Contribution to Post-Spaceflight Orthostatic Intolerance		
<b>Division Name:</b>	Human Research		
<b>Program/Discipline:</b>	HUMAN RESEARCH		
<b>Program/Discipline--Element/Subdiscipline:</b>	HUMAN RESEARCH--Physiology		
<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>	None		
<b>Space Biology Element:</b>	None		
<b>Space Biology Cross-Element Discipline:</b>	None		
<b>Space Biology Special Category:</b>	None		
<b>PI Email:</b>	<a href="mailto:serrador@hms.harvard.edu">serrador@hms.harvard.edu</a>	<b>Fax:</b>	FY 617/632-8685
<b>PI Organization Type:</b>	UNIVERSITY	<b>Phone:</b>	617/632-8843
<b>Organization Name:</b>	Harvard Medical School		
<b>PI Address 1:</b>	BIDMC - Palmer 117		
<b>PI Address 2:</b>	One Deaconess Road		
<b>PI Web Page:</b>			
<b>City:</b>	Boston	<b>State:</b>	MA
<b>Zip Code:</b>	02215	<b>Congressional District:</b>	8
<b>Comments:</b>			
<b>Project Type:</b>	GROUND	<b>Solicitation / Funding Source:</b>	2003 Biomedical Research & Countermeasures 03-OBPR-04
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<b>No. of Post Docs:</b>	0	<b>No. of PhD Degrees:</b>	
<b>No. of PhD Candidates:</b>	0	<b>No. of Master' Degrees:</b>	
<b>No. of Master's Candidates:</b>	0	<b>No. of Bachelor's Degrees:</b>	
<b>No. of Bachelor's Candidates:</b>	0	<b>Monitoring Center:</b>	NASA JSC
<b>Contact Monitor:</b>	<b>Contact Phone:</b>		
<b>Contact Email:</b>			
<b>Flight Program:</b>			
<b>Flight Assignment:</b>			
<b>Key Personnel Changes/Previous PI:</b>			
<b>COI Name (Institution):</b>	Black, Owen ( Legacy Health System ) Lipsitz, Lewis ( Hebrew Rehabilitation Center for Aged ) Schlegel, Todd ( NASA Johnson Space Center ) Wood, Scott ( Naval Aerospace Medical Research Laboratory )		
<b>Grant/Contract No.:</b>	NNJ04HI13G		
<b>Performance Goal No.:</b>			
<b>Performance Goal Text:</b>			

Task Description:	<p>Post-spaceflight orthostatic intolerance, a principal NASA safety concern, is a complex multi-factorial problem that continues to be poorly understood. Recent evidence clearly suggests that the vestibular otolith system, which is directly affected by spaceflight, assists in both autonomic and blood pressure regulation during orthostatic stress. Vestibular activation has also has direct effects on cerebral blood flow suggesting that vestibular inputs also affect the cerebrovascular response to orthostasis. The goal of this research is to examine the role of vestibular inputs in cerebral blood flow regulation and the effect of these inputs on orthostatic tolerance. Our general hypothesis is that otolith mediated vestibular inputs act as a feed forward mechanism causing cerebral vasodilation to compensate for the decrease in cerebral perfusion pressure during the upright posture. This project's four specific aims are to: 1) Determine the effect of tilts in the pitch plane with and without visual feedback on cerebral blood flow and cerebral autoregulation in healthy elderly with and without vestibular hypofunction and healthy young subjects.; 2) Determine the effect of otolith vs otolith and canal stimulation on cerebral blood flow in healthy elderly with and without vestibular hypofunction and healthy young subjects. This aim will be accomplished by varying the radius of rotation of subjects on a short arm centrifuge; 3) Determine the effect of canal vs canal and otolith stimulation on cerebral blood flow in elderly subjects with normal and reduced vestibular function. This aim will be accomplished by using earth vertical axis rotations vs. head tilt while supine or prone; 4) Determine the effect of training subjects to associate otolith input as tilt on cerebral blood flow during orthostatic stress in elderly subjects with intact and impaired vestibular function. This aim will be accomplished by training subjects with tilt or centrifugation to interpret otolith signals as either translation or tilt by providing visual scenes to reinforce this perception. The results of these studies will provide direct evidence on the role of vestibular inputs in cerebrovascular regulation. This work may lead to new methods to diagnose and treat not only post-spaceflight orthostatic intolerance but also the ~500,000 otherwise healthy subjects that are affected by orthostatic intolerance.</p>
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2004.
Bibliography Type:	Description: (Last Updated: 10/31/2019)