Fiscal Year:	FY 2004	**Task Last Updated:**	FY 12/15/2010
PI Name:	Rubin, Clinton Ph.D.		
Project Title:	Retention of skeletal, musculature, and postural status with a non-invasive, extremely low-level mechanical signal: a ground-based evaluation of efficacy		
Division Name:	Human Research		
Program/Discipline:	HUMAN RESEARCH		
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Physiology		
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	(1) **HHC**:Human Health Countermeasures		
Human Research Program Risks:	(1) **Bone Fracture**:Risk of Bone Fracture due to Spaceflight-induced Changes to Bone (2) **Osteo**:Risk Of Early Onset Osteoporosis Due To Spaceflight		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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PI Organization Type:	UNIVERSITY	**Phone:**	631-632-8521
Organization Name:	State University of New York		
PI Address 1:	Department of Biomedical Engineering		
PI Address 2:	Center for Biotechnology		
PI Web Page:	http://www.bme.sunysb.edu		
City:	Stony Brook	**State:**	NY
Zip Code:	11794-2580	**Congressional District:**	1
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	2003 Biomedical Research & Countermeasures 03-OBPR-04
Start Date:	07/01/2004	**End Date:**	06/30/2008
No. of Post Docs:	0	**No. of PhD Degrees:**	0
No. of PhD Candidates:	2	**No. of Master' Degrees:**	0
No. of Master's Candidates:	1	**No. of Bachelor's Degrees:**	0
No. of Bachelor's Candidates:	0	**Monitoring Center:**	NASA JSC
Contact Monitor:		**Contact Phone:**	
Contact Email:			
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Judex, Stefan (State University of New York at Stony Brook) Qin, Yi-Xian (State University of New York at Stony Brook)		
Grant/Contract No.:	NNJ04HA02G		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	The osteoporosis which develops in microgravity is one of the greatest hurdles to an extended human presence in space. Earth-based animal and human studies have demonstrated that extremely low magnitude mechanical stimuli (LMMS), if imposed at a high frequency, is strongly anabolic to the skeleton, and can serve to inhibit the bone loss, which typically parallels disuse. This experiment is designed to evaluate the efficacy of this unique biomechanical countermeasure to inhibit the disuse induced osteoporosis seen in long term bed-rest, the closest ground based equivalent of microgravity. To achieve this in a non-invasive, non-pharmacologic means would have tremendous impact not only in space, but would also address the bone loss which plagues over 20 million people world wide each year on earth. Project aims: 1) Show that application of low magnitude (0.3g), high frequency (30Hz) mechanical stimulation, will reduce the loss of bone seen with long term disuse; 2) Show that application of low magnitude, high frequency mechanical stimulation will improve the postural control of subjects undergoing long term bed-rest; 3) Determine if long term bed-rest affects the sensitivity of the lower extremities.; 3.b) Determine if the application of low magnitude, high frequency mechanical stimulation will inhibit the changes if they exist
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	To achieve this in a non-invasive, non-pharmacologic means would have tremendous impact not only in space, but would also address the bone loss which plagues over 20 million people world wide each year on earth.
Task Progress:	New project for FY2004. [Ed. note: FY2004 record added in December 2010 for statistical reporting purposes]
Bibliography Type:	Description: (Last Updated: 10/22/2009)