Task Book Report Generated on: 05/08/2024

Pr Name: Schaffler, Michell R, Ph.D.  Project Title: Bone Recovery Potential After Bisphoophonate and PTH Treatment of Distue Osteoporosis  Division Name: Human Recearch Program/Discipline: NSBRI Teams  Program/Discipline: NSBRI Teams  Program/Discipline: NSBRI Teams  NSBRI Teams—Bone Loss Team  Joint Agency Name: TechPort: No  Human Research Program Relaws: (J) HHC/Human Health Countermeasures  (J) Human Research Program Relaws: (J) Bone Fracture-Risk of Done Fracture due to Spacellight-induced Changes to Bone (2) Osteo-Risk Of Farly Onset Osteoporosis Due To Spacellight  Program/Discipline: None  Space Biology Cross-Element  None  Space Biology Cross-Element  Discipline: None  PI Email: Michell Schaffler@moon.edu Far: FY 212-426-7750  PI Organization Type: ONNERSTY Phone: 212-241-1625  Organization Name: Mount Siani School of Medicine  PI Address 1: One Gustrue L Levy Place  PI Address 1: One Gustrue L Levy Place  PI Address 2: Box 1188  PI Web Page:  City: New York State: NY  Clogo Congressional District 14  Comments:  Project Type: GROUND Sulicitation / Funding 2003 Homedical Research & Source: Countermeasure, 03-OpPR-04  Start Date: No. of Past Does: No. of Past Decres: 1  No. of Past Does: No. of Bachelor's Degress: 0  No. of Past Does: No. of Bachelor's Degress: 0  No. of Bachelor's Candidates: 0  No. of Bachelor's Candidates: 0  No. of Bachelor's Candidates: 0  No. of Bachelor's Degress: 0  No. of Bachelor's Candidates: 0  Contact Monitor: Counter Home:  Fight Program:  Fight Assignment: Key Personnel Clanges/Persons FI:  COI Name (Institution): Migska, Robert (Mount Sinai School of Medicine )	Fiscal Year:	FY 2006	Task Last Updated:	FY 01/08/2007
Project Title:    Bone Recovery Potential After Bisphosphomate and PTH Treatment of Disuse Osteoporosis   Division Name:			Tusk Eust opunted.	11 01/00/2007
Division Name:   Human Research		,	Treatment of Disuse Osteono	rosis
Program/Discipline: Program/Discipline- Element/Subdiscipline: Jaint Agency Name:    Itaman Research Program Elements:   Itaman Research Program Elements:   Itaman Research Program Elements:   (1) Bine Fracture/Rik of Bone Fracture due to Spaceflight-induced Changes to Bone (2) Ostor Risk of Enthr due to Spaceflight-induced Changes to Bone (2) Ostor Risk of Enthr due to Spaceflight-induced Changes to Bone (2) Ostor Risk of Enthr Onse Ostorporosis Due To Spaceflight   Space Biology Cross-Element	110ject 11tte.	Bone receivery received rates Bisphosphoniae and rate	Treatment of Bisase Osteopo.	10015
Program/Discipline-  Element/Subdiscipline-  Element/Subdiscipline-  Iluman Research Program Elements: (1)   IlmC: Iluman Ilealth Countermeasures	Division Name:	Human Research		
ElementShothiscipline:  Joint Agency Name:  None  None  Space Biology Cross-Element:  None  None  Space Biology Special Category:  None  Mone  Joint Agency Name:  Mone  Joint Agency Name:  Mone  Joint Agency Name:  Joint Agency Name:  Mone  Joint Agency Name:  Joint	Program/Discipline:	NSBRI Teams		
Human Research Program Elements: (1) HIIC-Human Health Countermeasures  Human Research Program Risks: (1) Bone Fracture-Risk of Bone Fracture due to Spaceflight-induced Changes to Bone (2) Oxtoc-Risk Of Early Onset Osteo-porosis Due To Spaceflight  Space Biology Element: None  Space Biology Special Category: None  Space Biology Special Category: None  PI Email: Mitchell Schafflerfürmssm.edu Fax: FY 212-426-7750  PI Organization Type: UNIVERSITY Phone: 212-241-1625  Organization Name: Mount Sinai School of Medicine  PI Address 1: One Gustave L. Levy Place  PI Address 2: Box 1188  PI Web Page:  City: New York State: NY  Zip Code: 10029-6500 Congressional District: 14  Comments:  Project Type: GROUND Solicitation / Funding 2003 Biomedical Research & Source: Countermeasures Os-OBFR-06  Start Date: 06/01/2004 End Dat: Solicitation / Funding 2003 Biomedical Research & Source: Countermeasures Os-OBFR-06  No. of Post Docs: 1 No. of PhD Degrees: 1  No. of PhD Candidates: 1 No. of Master's Degrees: 0  No. of Master's Candidates: 0 No. of Bachelor's Candidates: 0 Monitoring Center: NSBRI  Contact Monitor: Contact Email:  Flight Arsignment:  Key Personnel Changes/Previous PI:  COI Name (Institution): Mejeska, Robert (Mount Sinai School of Medicine)  Mijeska, Robert (Mount Sinai School of Medicine)  Mijeska, Robert (Mount Sinai School of Medicine)  Performance Goal No.:		NSBRI TeamsBone Loss Team		
Human Research Program Risks:  (1) Bone Fracture Risk of Bone Fracture due to Spaceflight-induced Changes to Bone (2) Oxteo-Risk Of Early Onset Oxteoporosis Due To Spaceflight  Space Biology Cross-Element Discipline:  None  Space Biology Special Category: None  PI Email: Mitchell Schaftler@mssm.edu PI Organization Type: UINIVERSITY Phone: 212-241-1625  Organization Name: Mount Sinai School of Medicine PI Address 1: One Gustave L. Levy Place PI Address 2: Box 1188  PI Web Page: City: New York State: NY  Zip Code: 10029-6500 Congressional District: 14  Comments:  Project Type: GROUND Solicitation / Funding Source: Countermeasures (3)-OBPR-04  Start Date: No. of Post Docs: 1 No. of Post Docs: 1 No. of Master' S Candidates: 1 No. of Master' S Candidates: 0 No. of Bachelor's Candidates: Contact Email: Flight Assignment: Key Personnel Changes/Previous PI: COI Name (Institution): Majeska, Robert (Mount Sinai School of Medicine) Performance Goal No.:	Joint Agency Name:		TechPort:	No
Space Biology Element: None None Space Biology Cross-Element Discipline: None Space Biology Cross-Element Discipline: None Space Biology Special Category: None Pt Email: Mitchell Schaffler@mssm.edu Fax: FY 212-426-7750 Pt Organization Type: UNIVERSITY Phone: 212-241-1625 Organization Name: Mount Simai School of Medicine Pt Address 1: One Gustave L. Levy Place Bridger St. State: NY Organization Name: Mount Simai School of Medicine Pt Address 2: Box 1188 Pt Web Page: City: New York State: NY Organization Name: New York State: NY Organization State: NY Organization Name: New York State: NY Organization State: NY Organization State: NY Organization No. Organizati	<b>Human Research Program Elements:</b>	(1) <b>HHC</b> :Human Health Countermeasures		
Space Biology Cross-Element Discipline:  Space Biology Special Category:  None  PI Email:  Mitchell Schaffler@mesm.edu  PI Organization Type:  UNIVERSITY  Phone: 212-241-1625  Organization Name:  Mount Sinai School of Medicine  PI Address 1:  One Gustave L. Levy Place  PI Address 2:  Box 1188  PI Web Page:  City:  New York  State: NY  Zip Code:  Comments:  Project Type:  GROUND  Solicitation / Funding 2003 Biomedical Research & Source:  Countermeasures 03-OBPR-04  Start Date:  No. of Post Does:  1  No. of PhD Candidates:  1  No. of Master's Candidates:  0  No. of Bachelor's Degrees:  One Gustave L. Levy Place  No. of Bachelor's Candidates:  One Gustave L. Levy Place  No. of Monitoring Center:  NSBRI  Contact Monitor:  Contact Email:  Flight Program:  Flight Assignment:  Key Personnel Changes/Previous PI:  COI Name (Institution):  Mjeska, Robert (Mount Sinai School of Medicine)  Mnjeska, Robert (Mount Sinai School of Medicine)  Mnjeska, Robert (Mount Sinai School of Medicine)  Performance Goal No.:	Human Research Program Risks:			
Discipline:   None   Space Biology Special Category:   None	Space Biology Element:	None		
Pl Email:   Mitchell Schaffler@mssm.edu   Fax: FY 212-426-7750     Pl Organization Type:   UNIVERSITY   Phone: 212-241-1625     Organization Name:   Mount Sinai School of Medicine     Pl Address 1:   One Gustave L. Levy Place     Pl Address 2:   Box 1188     Pl Web Page:   City:   New York   State: NY     Zip Code:   10029-6500   Congressional District: 14     Comments:   Comments:     Project Type:   GROUND   Solicitation / Funding Source:   Countermeasures 03-0BPR-04     State Date:   06/01/2004   End Date:   05/31/2008     No. of Post Docs:   1   No. of PhD Degrees: 1     No. of PhD Candidates:   1   No. of Master' Degrees: 0     No. of Master's Candidates:   0   No. of Bachelor's Degrees: 0     No. of Bachelor's Candidates:   0   Monitoring Center: NSBRI     Contact Monitor:   Contact Phone:     Contact Email:   Flight Program:     Flight Assignment:   Key Personnel Changes/Previous PI:     Key Personnel Changes/Previous PI:     COI Name (Institution):   Jepsen, Karl (Mount Sinai School of Medicine )     Majeska, Robert (Mount Sinai School of Medicine )     Majeska, Robert (Mount Sinai School of Medicine )     Performance Goal No.:		None		
Pl Organization Name:   Mount Sinai School of Medicine     Pl Address 1:   One Gustave L. Levy Place     Pl Address 2:   Box 1188     Pl Web Page:	Space Biology Special Category:	None		
Organization Name:         Mount Sinai School of Medicine           PI Address 1:         One Gustave L. Levy Place           PI Address 2:         Box 1188           PI Web Page:         City:         New York         State: NY           Zip Code:         10029-6500         Congressional District: 14           Comments:         Counterneasures 03-OBPR-04           Start Date:         O6'01/2004         End Date: 05'31/2008           No. of Post Docs:         1         No. of PhD Degrees: 1           No. of PhD Candidates:         1         No. of Master' Degrees: 0           No. of Master's Candidates:         0         No. of Bachelor's Degrees: 0           No. of Bachelor's Candidates:         0         No. of Bachelor's Degrees: 0           No. of Bachelor's Candidates:         0         No. of Bachelor's Degrees: 0           Contact Monitor:         Contact Phone:           Contact Email:         Contact Phone:           Flight Program:         Flight Program:           Flight Symment:         Key Personnel Changes/Previous PI:           COI Name (Institution):         Jepsen, Karl (Mount Sinai School of Medicine) Majeska, Robert (Mount Sinai School of Medicine)           Grant/Contract No.:         NCC 9-58-BL00406	PI Email:	Mitchell.Schaffler@mssm.edu	Fax:	FY 212-426-7750
PI Address 1: One Gustave L. Levy Place     PI Address 2: Box 1188     PI Web Page:	PI Organization Type:	UNIVERSITY	Phone:	212-241-1625
PI Address 2:   Box 1188     PI Web Page:	Organization Name:	Mount Sinai School of Medicine		
PI Web Page:   City: New York State: NY	PI Address 1:	One Gustave L. Levy Place		
City:         New York         State:         NY           Zip Code:         10029-6500         Congressional District:         14           Comments:         Project Type:         GROUND         Solicitation / Funding Source:         2003 Biomedical Research & Countermeasures 03-OBPR-04           Start Date:         06/01/2004         End Date:         05/31/2008           No. of Post Docs:         1         No. of PhD Degrees:         1           No. of PhD Candidates:         1         No. of Master' Degrees:         0           No. of Bachelor's Candidates:         0         Monitoring Center:         NSBRI           Contact Monitor:         Contact Phone:           Contact Email:         Flight Program:           Flight Assignment:         Key Personnel Changes/Previous PI:           COI Name (Institution):         Jepsen, Karl (Mount Sinai School of Medicine) Majeska, Robert (Mount Sinai School of Medicine)           Grant/Contract No.:         NCC 9-58-BL00406           Performance Goal No.:         Performance Goal No.:	PI Address 2:	Box 1188		
Zip Code: 10029-6500 Congressional District: 14  Comments:  Project Type: GROUND Solicitation / Funding Source: Countermeasures 03-OBPR-04  Start Date: 06/01/2004 End Date: 05/31/2008  No. of Post Docs: 1 No. of PhD Degrees: 1  No. of PhD Candidates: 1 No. of Master' Degrees: 0  No. of Master's Candidates: 0 No. of Bachelor's Degrees: 0  No. of Bachelor's Candidates: 0 Monitoring Center: NSBRI  Contact Monitor: Contact Email: Flight Program: Flight Assignment:  Key Personnel Changes/Previous PI:  COI Name (Institution): Jepsen, Karl (Mount Sinai School of Medicine) Majeska, Robert (Mount Sinai School of Medicine) Grant/Contract No.: NCC 9-58-BL00406  Performance Goal No.:	PI Web Page:			
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Source: Countermeasures 03-OBPR-04  Start Date: 06/01/2004 End Date: 05/31/2008  No. of Post Docs: 1 No. of PhD Degrees: 1  No. of PhD Candidates: 1 No. of Master' Degrees: 0  No. of Master's Candidates: 0 No. of Bachelor's Degrees: 0  No. of Bachelor's Candidates: 0 Monitoring Center: NSBRI  Contact Monitor: Contact Phone:  Contact Email:  Flight Program:  Flight Assignment:  Key Personnel Changes/Previous PI:  COI Name (Institution): Jepsen, Karl (Mount Sinai School of Medicine)  Majeska, Robert (Mount Sinai School of Medicine)  Grant/Contract No.: NCC 9-58-BL00406  Performance Goal No.:	Comments:			
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No. of PhD Candidates:  1	Start Date:	06/01/2004	End Date:	05/31/2008
No. of Master's Candidates:  0	No. of Post Docs:	1	No. of PhD Degrees:	1
No. of Bachelor's Candidates: 0 Monitoring Center: NSBRI  Contact Monitor: Contact Phone:  Contact Email:  Flight Program:  Flight Assignment:  Key Personnel Changes/Previous PI:  COI Name (Institution): Jepsen, Karl (Mount Sinai School of Medicine)  Majeska, Robert (Mount Sinai School of Medicine)  Grant/Contract No.: NCC 9-58-BL00406  Performance Goal No.:	No. of PhD Candidates:	1	No. of Master' Degrees:	0
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Flight Assignment:  Key Personnel Changes/Previous PI:  COI Name (Institution):  Jepsen, Karl (Mount Sinai School of Medicine)  Majeska, Robert (Mount Sinai School of Medicine)  Grant/Contract No.:  NCC 9-58-BL00406  Performance Goal No.:	Contact Monitor:		<b>Contact Phone:</b>	
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Key Personnel Changes/Previous PI:  COI Name (Institution):  Jepsen, Karl (Mount Sinai School of Medicine) Majeska, Robert (Mount Sinai School of Medicine)  Grant/Contract No.:  NCC 9-58-BL00406  Performance Goal No.:	Flight Program:			
COI Name (Institution):  Jepsen, Karl (Mount Sinai School of Medicine)  Majeska, Robert (Mount Sinai School of Medicine)  Orant/Contract No.:  NCC 9-58-BL00406  Performance Goal No.:	Flight Assignment:			
Majeska, Robert (Mount Sinai School of Medicine)  Grant/Contract No.: NCC 9-58-BL00406  Performance Goal No.:	Key Personnel Changes/Previous PI:			
Performance Goal No.:	COI Name (Institution):			
	Grant/Contract No.:	NCC 9-58-BL00406		
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Task Description:	Bone loss in microgravity and the resulting bone fragility have been identified by NASA as key barriers to successful long-term space flight. Effective countermeasures must therefore prevent bone loss, but also to maintain the mechanical integrity of the tissue during prolonged space flight and allow rapid recovery of normal function.  Disuse osteoporosis in humans and higher mammals results from elevated bone resorption. Thus, targeting osteoclasts with antiresorptive agents like bisphosphonate to prevent bone loss is a key strategy. While anti-resorptive drugs have been the cornerstones of osteoporosis therapy, anabolic agents, such as PTH, that stimulate bone formation represent an important new advance in the treatment of osteoporosis. We hypothesize that PTH may be especially valuable in reversing disuse if the deterioration of bone architecture can be slowed such that the anabolic agent has a better initial bone scaffold on which to work.  The studies examine whether bone that remains after bisphosphonate-treatment during long-term immobilization can recover its architecture and mechanical function after restoration of mechanical usage (remobilization). We will then assess whether addition of anabolic PTH during immobilization will improve recovery of disuse bone. Recovery after long-term disuse with bisphosphonate treatment will be examined in an immobilization model. MicroCT imaging will be used to evaluate microstructure, biomechanical testing to assess function and histomorphometry to measure tissue physiological responses.
Rationale for HRP Directed Research	:
Research Impact/Earth Benefits:	The current research applies directly to prevention and treatment of osteoporosis on Earth. In particular, these studies will examine 1) the efficacy of antiresorptive therapy in slowing the bone loss that occurs with decreased of mechanical loading, and 2) the role of the bone anabolic agent, PTH, in accelerating bone recovery and restoring bone strength. This research uses pharmacological agents that are already approved for clinical use; thus the findings from this research can be expected to see rapid implementation in bone loss situations occurring as a result of unloading, such as spinal cord injury and long-term immobilization.
Task Progress:	Long-term in vivo studies (Immobilization with and without, followed by restored weight bearing with and without anabolic PTH treatment, total duration 18 month durations) are ongoing and will be completed in late fall, 2006. Analyses of bone architecture, histomorphometry and biomechanics will begin thereafter. Our studies a structurally-based ultrasound for the prediction of mechanical properties bone are ongoing. Studies on the bone tissues from the current resorption suppression/remobilization + PTH experiments will be performed as these tissues become available.
Bibliography Type:	Description: (Last Updated: 08/21/2020)
Articles in Peer-reviewed Journals	Li, CY., C. Price, D. A. Laudier, R. J Majeska and M. B. Schaffler "Risedronate treatment only partially preserves cancellous bone mass and microarchitecture after long-term disuse" Jan-2006
Articles in Peer-reviewed Journals	McNamara LM, Prendergast PJ, Schaffler MB. "Bone tissue material properties are altered during osteoporosis." J Musculoskelet Neuronal Interact. 2005 Oct-Dec;5(4):342-3. <a href="mailto:pMID: 16340130">PMID: 16340130</a> , Oct-2005
Articles in Peer-reviewed Journals	Wang L, Wang Y, Han Y, Henderson SC, Majeska RJ, Weinbaum S, Schaffler MB. "In situ measurement of solute transport in the bone lacunar-canalicular system." Proc Natl Acad Sci U S A. 2005 Aug 16;102(33):11911-6. <a href="PMID: 16087872">PMID: 16087872</a> , Aug-2005