Fiscal Year:	FY 2008	**Task Last Updated:**	FY 06/26/2008
PI Name:	Hogan, Harry Ph.D.		
Project Title:	Contributors to Long-Term Recovery of Bone Strength following Exposure to Microgravity		
Division Name:	Human Research		
Program/Discipline:	HUMAN RESEARCH		
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Biomedical countermeasures		
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		
PI Email:	hhogan@tamu.edu	**Fax:**	FY
PI Organization Type:	UNIVERSITY	**Phone:**	979-845-1538
Organization Name:	Texas A&M University		
PI Address 1:	Dept. of Mechanical Engineering		
PI Address 2:	TAMU 3123		
PI Web Page:			
City:	College Station	**State:**	TX
Zip Code:	77843-3123	**Congressional District:**	17
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	2007 Crew Health NNJ07ZSA002N
Start Date:	05/20/2008	**End Date:**	05/19/2011
No. of Post Docs:		**No. of PhD Degrees:**	
No. of PhD Candidates:		**No. of Master' Degrees:**	
No. of Master's Candidates:		**No. of Bachelor's Degrees:**	
No. of Bachelor's Candidates:		**Monitoring Center:**	NASA JSC
Contact Monitor:		**Contact Phone:**	
Contact Email:			
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Bloomfield, Susan (Texas A&M University) Martinez, Daniel (University of Houston)		
Grant/Contract No.:	NNX08AQ35G		
Performance Goal No.:			
Performance Goal Text:			
Task Description:	Recent concern has been raised over differences in recovery of bone strength and related parameters following extended space flight. The long term health consequences for crew members are unclear, so the problem needs to be better understood. The proposed research will address this problem through a series of experiments using the adult male hindlimb unloaded (HU) rat model, which is a widely used and well-accepted analog for microgravity. Many bone properties, most notably bone strength, are not directly measurable on humans, and this is where animal studies provide a crucial role. Further, animal studies allow for tight control of experimental variables and can be concluded in a relatively short time period (compared to bed-rest or flight-based studies). Experiments will be conducted to characterize: (a) the time course of recovery from simulated microgravity (28d HU), (b) response to a second HU exposure (following an initial HU exposure plus recovery), and (c) the effects of exercise on recovery dynamics. The two exercise will be		

	resistance training and treadmill running. The overall objective is to define the relationships between three different, but crucial, types of bone parameters: bone mass, bone mineral density, and bone quality. Bone mass is characterized by size, shape, and bone mineral content (BMC). The new knowledge gained from the proposed studies will provide a better understanding of the factors affecting long term astronaut health. The results will provide direct, quantitative, and objective evidence for better defining the risk of space travel on long term crew member health. The results will also help define which factors are most critical to monitor in assessing recovery of bone health following single or multiple missions.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2008.
Bibliography Type:	Description: (Last Updated: 01/11/2021)