Piname:   Qin, Yi-Xian Ph.D.     Project Title:   Combined Scaming Confined II Prasound Diagnostic and Treatment System for Bore Quality Assessment and Fracture II Program Discipline:     Division Name:   Human Research     Program Discipline:				
Combined Scanning Confocal Ultrasound Diagnostic and Treatment System for Bows Quality Assessment and Fracture to System Solution Name:       Division Name:     Human Research       Program/Divipiline:     SUBRI – Smart Medical Systems and Technology Team       Element29 Medicabilize:     NSBRI       Joint Agency Town Divipiline:     Itel Program/Divipiline:       Joint Agency Town Divipiline:     NSBRI       Joint Agency Town Divipiline:     Itel Program/Divipiline:       Joint Agency Town Divipiline:     Otexne: Exploration Medical Capabilities       Joint Agency Town Divipiline:     (I) Dure Treature: Rike of Bone Fracture due to Spaceffight Human Devectores In Performance Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions Sub of Adverse Ileaht Outeones Due to Medical Condutions	Fiscal Year:	FY 2009	Task Last Updated: FY 10/06/2008	
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Space Biology Cross-Element     Nome       Space Biology Special Category:     None       Space Biology Special Category:     None       PI Email:     vixianajationstwook.edu     Fax: FY 631-632-8577       PI Organization Type:     UNIVERSITY     Phone: 631-632-1481       Organization Amae:     SUNY- The State University of New York     Image: Figure State State State University of New York       PI Address 1:     Orthopaedic Bioengineering Bidg     Image: Figure State St	Human Research Program Risks:	(2) Medical Conditions: Risk of Adverse Health that occur in Mission, as well as Long Term Heal (3) Osteo: Risk Of Early Onset Osteoporosis Due	Dutcomes and Decrements in Performance Due to Medical Condi th Outcomes Due to Mission Exposures	tions
Discipline: "   None     Space Biology Special Category:   None     PI Email:   vixian gin@istonvbrook.edu   Fax: FY 631-632-8577     PI Organization Type:   UNIVERSITY   Phone: 631-632-1481     Organization Type:   UNIVERSITY   Phone: 631-632-1481     Organization Name:   Software State University of New York:   Term     PI Address 1:   Orthopaedic Bioengineering Research Laboratory   Term     PI Meb Page:   Term   Term     City:   Song Brook   State: NY     Zip Code:   11794-5281   Congressional District: 1     Comments:   Soft Sorg Brook   Solicitation: Provincing: 2007 Crew Health     Start Date:   1101/2008   End Date: 10/31/2012     No. of PhoD Condidates:   No. of PhoD Degrees:   No. Of Solicitation: 2007 Crew Health     No. of PhoD Condidates:   No. of Master's Candidates:   No. of Solicitation: 2007 Crew Health     No. of PhoD Condidates:   No. of Master's Candidates:   No. of Solicitation: 2007 Crew Health     No. of PhoD Condidates:   No. of Master's Candidates:   No. of Solicitation: 2007 Crew Health     No. of Master's Candidates:   No. of Master's Candidates:   None: 2000 Contart Phone: </td <td>Space Biology Element:</td> <td>None</td> <td></td> <td></td>	Space Biology Element:	None		
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International System   UNIVERSITY   Phone:   631-632-1481     Organization Syme:   SUNVERSITY   Phone:   631-632-1481     Organization Name:   SUNVERSITY   Phone:   631-632-1481     PI Address 1:   Orthopaedic Bioengineering Research Laboratory   Image: Comparison   Image: Comparison     PI Address 2:   Room 215, Bioengineering Bldg   State:   NY     PI Web Page:   Image: Comparison   Image: Comparison   Image: Comparison     Zip Code:   Image: Comparison   State:   NY     Comments:   Image: Comparison   Image: Comparison   Image: Comparison   Image: Comparison   Solicitation / Funding Solicitation / Source:   NN072SA002N     Start Date:   Image: Comparison   Image: Comparison   Image: Comparison   NN072SA002N     Start Date:   Image: Comparison   Solicitation / Funding Solicitation / Funding Solicitation:   NN072SA002N     Start Date:   Image: Comparison   Solicitation / Source:   NN072SA002N     Soli of Soli Combit   Soli of Source:   NN072SA002N   NN072SA002N     No of Phol Combidates:   No. of Master' Source:   NN of Source:   NN of Source:   NN of Source:	Space Biology Special Category:	None		
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Zip Code:1179-5281Congressional District:1Comments:Project Type:GROUNDSolicitation / Funding Source:2007 Crew Health NNU07ZSA002NStart Date:11/01/2008End Date:10/31/2012No. of Post Docs:No. of PhD Degrees:10/31/2012No. of PhD Candidates:No. of Master' Degrees:Image: Conditation / FundingNo. of Master's Candidates:No. of Master' Degrees:Image: Conditation / FundingNo. of Master's Candidates:No. of Master' Degrees:Image: Conditation / FundingNo. of Master's Candidates:No. of Master' Degrees:Image: Conditation / FundingContact Monitor:Contact Phone:Image: Conditation / FundingContact Email:Image: Conditation / FundingImage: Conditation / FundingFlight Arsignment:Image: Conditation / FundingImage: Conditation / FundingKey Personnel Changes/Previous PI:State University of New York / Subin, Clinton (State University of New York )Image: Conditation (State University of New York )Grant/Contract No.:Mirza, Naureen (The Research Foundation of the State University of New York )Image: Conditation (State University of New York )Grant/Contract No.:Mirza, Naureen (The Research Foundation of the State University of New York )Image: Conditation (State University of New York )Grant/Contract No.:Mirza, Naureen (The Research Foundation of the State University of New York )Image: Conditation (State University of New York )Grant/Contract No.:Mirza, Naureen (The Research Foundation of the State University of New York )	PI Web Page:			
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COI Name (Institution):   Gelato , Marie (The Research Foundation of the State University of New York )     Rubin, Clinton (State University of New York )     Grant/Contract No.:   NCC 9-58-SMST01603     Performance Goal No.:	Key Personnel Changes/Previous PI:			
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	Grant/Contract No.:	NCC 9-58-SMST01603		
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Task Description:	Musculoskeletal complications, i.e., osteoporosis, induced by microgravity during extended space mission and age-related disorders represent a key health problem. Osteoporosis will diminish both the structure and strength of bone, each considered critical in defining the ability of the bone to resist fracture. Early diagnosis of such progressive bone loss would allow prompt treatment, and thus inherently reduce the risk of fracture. Bone mineral density (BMD) measurement is a well-accepted, standard assessment used for the diagnosis of osteopenia and osteoporosis, using dual-energy X-ray Absorptiometry (DXA) in the clinic. However, it is limited to a BMD index and insensitive to bone's physical properties. Advents in quantitative ultrasound (QUS) techniques can characterize both BMD and the material properties. Using a newly developed noninvasive Scanning Confocal Acoustic Diagnostic (SCAD) technology, strong correlations between SCAD determined data and bone's structural and strength parameters were observed. Ultrasound has also been shown therapeutic potentials to accelerate fracture healing. The objectives of this study are to develop a combined diagnostic and treatment ultrasound technology for early prediction of bone disorder and guided acceleration of fracture healing, using SCAD imaging and low-intensity pulse ultrasound. The technology will target to the critical skeletal sites, where may be significantly affected by disue osteopenia and potentially at the risk of fracture, i.e., hip, long bone and wrist regions. We will evaluate bone <sub>i</sub> s quality in clinical human subjects, and at the JSC/UTMB bedrest facility. Animal models and cadaver will be used for testing feasibility of identifying bone loss, fracture, and longitudinally treatment and monitoring. A noninvasive diagnostic and treatment technology using ultrasound will have significant potentials to prevent and treat bone fracture, and will address critical questions in the Bioastronautics Roadmap related to bone loss monitoring, prevention and rec	
Rationale for HRP Directed Research:		
Research Impact/Earth Benefits:	A noninvasive diagnostic and treatment technology using ultrasound will have significant potentials to prevent and treat bone fracture.	
Task Progress:	New project for FY2009.	
Bibliography Type:	Description: (Last Updated: 02/17/2021)	