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| **Fiscal Year:** | FY 2011 | **Task Last Updated:** | FY 12/13/2010 |
| **PI Name:** | Bajaj, Devendra Ph.D. | | |
| **Project Title:** | Pharmaceutical Countermeasure Effects on Tissue-Level Quality of Immobilized Bone | | |
| **Division Name:** | Human Research | | |
| **Program/Discipline:** | NSBRI | | |
| **Program/Discipline--Element/Subdiscipline:** | NSBRI--Musculoskeletal Alterations Team | | |
| **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<br>(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:** | bajajde@umdnj.edu | **Fax:** | FY |
| **PI Organization Type:** | UNIVERSITY | **Phone:** | 410-242-7745 |
| **Organization Name:** | University of Medicine and Dentistry of NJ | | |
| **PI Address 1:** | Orthopaedics | | |
| **PI Address 2:** | 205 S Orange Ave | | |
| **PI Web Page:** | | | |
| **City:** | Newark | **State:** | NJ |
| **Zip Code:** | 07103-2785 | **Congressional District:** | 10 |
| **Comments:** | | | |
| **Project Type:** | GROUND | **Solicitation / Funding Source:** | 2010 NSBRI-RFA-10-01 Postdoctoral Fellowships |
| **Start Date:** | 11/01/2010 | **End Date:** | 10/31/2012 |
| **No. of Post Docs:** | 1 | **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:** | NSBRI |
| **Contact Monitor:** | | **Contact Phone:** | |
| **Contact Email:** | | | |
| **Flight Program:** | | | |
| **Flight Assignment:** | | | |
| **Key Personnel Changes/Previous PI:** | | | |
| **COI Name (Institution):** | Fritton, James ( MENTOR/University of Medicine and Dentistry of New Jersey ) | | |
| **Grant/Contract No.:** | NCC 9-58-PF02304 | | |
| **Performance Goal No.:** | | | |
| **Performance Goal Text:** | | | |
| **Task Description:** | POSTDOCTORAL FELLOWSHIP<br>Astronauts suffer from rapid bone loss during spaceflight that puts them at risk for fracture. Various countermeasures have been proposed to prevent bone loss in space, including use of pharmaceutical drugs.<br><br>Anti-resorptive drugs (bisphosphonates) that reverse bone loss in osteoporotic patients are being considered to prevent bone loss in flight crews during long-duration missions. However, the influence of bisphosphonates on the tissue-level mechanical properties of bone during and after a period of reduced weight bearing is not well understood. Of particular importance are properties pertaining to bone tissue fragility, such as fatigue life and fatigue-crack growth resistance. | | |

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| | This study will quantify the long-term effects of bisphosphonates on cortical bone tissue fragility in an established animal model for reduced weight bearing, using the immobilized forelimb. Also, this study will help ascertain the biomechanical safety of bisphosphonates for preventing bone loss in astronauts on long-duration space missions. |
| **Rationale for HRP Directed Research:** | |
| **Research Impact/Earth Benefits:** | |
| **Task Progress:** | New project for FY2011. |
| **Bibliography Type:** | Description: (Last Updated: 10/30/2019) |