Task Book Report Generated on: 04/25/2024

Fiscal Vera: PY 2011 Task Last Updated: PY 06-09/2011 PI Name: Urban, Randall M.D. Project Title: Testosterone Supplementation as a Countermeasure against Musculoskeletal Losses during Space Exploration Division Name: Human Research Program/Discipline: IUMAN RESEARCH Program/Discipline: HUMAN RESEARCH—Biomedical countermeasures Element/Subdiscipline: HUMAN RESEARCH—Biomedical countermeasures Element/Subdiscipline: IOMAN RESEARCH—Biomedical countermeasures Element/Subdiscipline: Yes Human Research Program Elements: (1) HHC-Human Health Countermeasures Element/Subdiscipline: None Space Biology Stement: None Space Biology Cross-Element: None Space Biology Special Category: None PI Email: muhan/Guotnh.edu Fax: PY PI Organization Type: UNIVERSITY None PI Email: muhan/Guotnh.edu Fax: PY PI Organization Type: UNIVERSITY Phone: 409-772-1176 Organization Name: University of Texas Medical Branch at Galveston PI Address 1: 301 University Blvd. PI Address 2: Rt. 0569 - 4.124 JSA PI Web Page: City: Galveston State: TX Project Type: GROUND Solicitation / Funding Source: 2009 Grew Health NNI09ZSA002N Start Date: O7502010 End Date: 07592013 No. of Pat Desce: No. of Master' Degrees: No. of Master's Candidates: Norsk, Peter Contact Phone: Contact Monitoring Center: NASA JSC Contact Contact Phone: Dibon. Edgar Lichar Ph.D. (University of Texas Med				
Project Title: Testosterone Supplementation as a Countermeasure against Museuloskeletal Losses during Space Exploration  Division Name: Human Research  Program/Discipline: HUMAN RESEARCH  Program/Discipline: IIUMAN RESEARCH  Program/Discipline: IIUMAN RESEARCH  Joint Agency Name: TechPort: Yes  Human Research Program Elements: (1) HHC:Human Health Countermeasures  Human Research Program Risks: (1) MuscleRisk of Impaired Performance Due to Reduced Muscle Size, Strength and Endurance  Space Biology Element: None  Space Biology Cross-Element  Discipline: None  Space Biology Cross-Element  Discipline: University of Tests Medical Branch at Galveston  PI Email: unbaniforumb.edu Fax: FY  Pl Organization Type: UNIVERSITY Phone: 409-772-1176  Organization Name: University of Tests Medical Branch at Galveston  PI Address 1: 301 University Blvd.  PI Address 2: Rt. 0569 - 4.124 JSA  PI Web Page:  City: Galveston State: TX  Zip Code: 77555-0569 Congressional District: 14  Comments:  Project Type: GROUND Solicitation / Funding Source: 2009 Crew Health NNJ09ZSA002N  Start Date: 0730-2010 End Date: 0729-2013  No. of Post Does: 1 No. of Master' Degrees:  No. of Master's Candidates: No. of Master' Degrees:  No. of Master's Candidates: No. of Bachelor's Candidates:	Fiscal Year:	FY 2011	Task Last Updated:	FY 06/09/2011
Division Nume:   Iluman Research	PI Name:	Urban, Randall M.D.		
Program/Discipline:   IIUMAN RESEARCH   HUMAN RESEARCH	Project Title:	Testosterone Supplementation as a Counte	ermeasure against Musculoskeletal Lo	osses during Space Exploration
Program/Discipline- Elemen/Subdiscipline- Elemen/Subdiscipline- Elemen/Subdiscipline- Elemen/Subdiscipline- Elemen/Subdiscipline- Elemen/Subdiscipline- Human Research Program Elements:  (I) HHC-Human Health Countermeasures  Human Research Program Risks:  (I) Muscle/Risk of Impaired Performance Due to Reduced Muscle Size, Strength and Endurance  Space Biology Cross-Element Discipline:  None  Space Biology Special Category:  None  PI Email:  ruthan/Gutinh.edu  Fax: FY  Pl Organization Type:  UNIVERSITY  Phone: 409-772-1176  Organization Name:  University of Texas Medical Branch at Galveston  PI Address 1:  301 University Blvd.  PI Address 2:  Rt. 0569 - 4.124 JSA  PI Web Page:  City:  Galveston  State: TX  Zip Code:  77555-0569  Congressional District:  14  Comments:  Project Type:  GROUND  Solicitation / Funding Source:  2009 Crew Health NNJ09ZSA002N  Start Date:  No. of Post Does:  1  No. of Post Does:  No. of Master's Candidates:  No. of Master's Candidates:  No. of Master's Candidates:  No. of Master's Candidates:  No. of Bachelor's Candidates:  No. of Bachelor's Candidates:  Norsk, Peter  Contact Monitor:  Norsk, Peter  Contact Email:  Peter anonk/Gunust.eto.  Peter anonk/Gunust.eto.  Peter anonk/Gunust.eto.  COI Name (Institution):  Paddon-Iones, Douglas Ph.D. (University of Texas Medical Branch) Sheffield-Moore, Medinal Ph.D. (University o	Division Name:	Human Research		
Element/Subdiscipline:  Joint Agency Name:  Joint Agency Name:  Human Research Program Elements:  Human Research Program Risks:  (I) Muscle Risk of Impaired Performance Due to Reduced Muscle Size, Strength and Endurance  Space Biology Cross-Element  None  Space Biology Cross-Element  Discipline:  None  Space Biology Special Category:  None  PI Email:  nuban@utmb.edu  Fax: FY  Pl Organization Type:  UNIVERSITY  Phone: 409-772-1176  Organization Type:  Organi	Program/Discipline:	HUMAN RESEARCH		
Human Research Program Elements: (1) HHC:Human Health Countermeasures  Human Research Program Risks: (1) Muxcle-Risk of Impaired Performance Due to Reduced Muscle Size, Strength and Endurance  Space Biology Cross-Element Discipline:  Space Biology Special Category: None  PI Email:  purban@utmb.edu PI Organization Type: UNIVERSITY Organization Type: UNIVERSITY Organization Name: University of Texas Medical Branch at Galveston  PI Address 1: 301 University Blvd. PI Address 2: Rt. 0569 - 4.124 JSA  PI Web Page:  City: Galveston State: TX  Zip Code: 77555-0569 Congressional District: 14  Comments:  Project Type: GROUND Solicitation / Funding Source: 2009 Crew Health NNJ09ZSA002N  Start Date: 07/30/2010 End Date: 07/30/2010 Fend Date: 07/30/20		HUMAN RESEARCHBiomedical count	termeasures	
Human Research Program Risks: (1) Muscle Risk of Impaired Performance Due to Reduced Muscle Size, Strength and Endurance  Space Biology Cross-Element Discipline:  None  Space Biology Special Category: None  PI Email:  rurban@atmb.edu  rurban@atmb.edu  rurban@atmb.edu  Fax: FY  Pl Organization Type: UNIVERSITY Phone: 409-772-1176  Organization Name: University of Texas Medical Branch at Galveston  PI Address I: 301 University Blvd.  PI Address I: Rt. 0569 - 4.124 JSA  PI Web Page: City: Galveston  State: TX  Zip Code: 77555-0569 Congressional District: 14  Comments: Project Type: GROUND Solicitation / Funding Source: 2009 Crew Health NNJ09ZSA00ZN  Start Date: 0730/2010 Rend Date: 0730/2010 Rend Date: 0730/2010 Rend Date: 0730/2010 Rend Date: No. of PhD Candidates: No. of Master' Degrees: No. of Master' Degrees: No. of Bachelor's Candidates: No. of Bachelor's Candidates: No. of Bachelor's Candidates: No. of Bachelor's Candidates: Peter.norsk@mass.gov  Flight Program: Flight Assignment: Key Personnel Changes/Previous PI:  COI Name (Institution): Durbam, William J Ph.D. (University of Texas Medical Branch) Paddon-Jones, Douglas Ph.D. (University of Texas Medical Branch) Dillon, Edgal Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgal Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgal Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgal Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgal Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgal Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgal Lichar Ph.D. (University of Texas Medical Branch) Performance Goal No.:	Joint Agency Name:		TechPort:	Yes
Space Biology Element: None  Space Biology Cross-Element Discipline:  None  PI Email: rurban@utmb.edu Fax: FY  PI Organization Type: UNIVERSITY Phone: 409-772-1176  Organization Name: University of Texas Medical Branch at Galveston  PI Address 1: 301 University Blvd.  PI Address 2: Rt. 0569 - 4.124 JSA  PI Web Page:  City: Galveston State: TX  Zip Code: 77555-0569 Congressional District: 14  Comments:  Project Type: GROUND Solicitation / Funding Source: 2009 Crew Health NNJ09ZSA002N  Start Date: 07730/2010 End Date: 07729/2013  No. of Post Does: 1 No. of PhD Degrees: No. of PhD Candidates: No. of Bachelor's Degrees: No. of Master's Candidates: No. of Bachelor's Degrees: No. of Bachelor's Candidates: No. of Bachelor's Degrees: Flight Assignment:  Key Personnel Changes/Previous PI:  COI Name (Institution): Durbam, William J Ph.D. (University of Texas Medical Branch) Paddon-Jones, Douglas Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch) Programs Performance Goal No.:	<b>Human Research Program Elements:</b>	(1) <b>HHC</b> :Human Health Countermeasures	3	
Space Biology Cross-Element Discipline:  Space Biology Special Category:  None  PI Email:  rurban@utmb.edu  Fax: FY  Pl Organization Type:  UNIVERSITY  Phone: 409-772-1176  Organization Name:  University of Texas Medical Branch at Galveston  PI Address 1:  301 University Blvd.  PI Address 2:  Rt. 0569 - 4.124 JSA  PI Web Page:  City:  Galveston  State: TX  Zip Code:  77555-0569  Congressional District: 14  Comments:  Project Type:  GROUND  Solicitation / Funding Source: 2009 Crew Health NNJ09ZSA002N  Start Date:  07/30/2010  End Date: 07/29/2013  No. of Pob Desc:  No. of Pab Candidates:  No. of Master's Candidates:  No. of Master' Degrees:  No. of Master' Degrees:  No. of Master' Scandidates:  No. of Master' Degrees:  No. of Bachelor's Candidates:  No. of Bachelor's Candidates:  No. of Bachelor's Candidates:  No. of Master' Degrees:  No. of Bachelor's Candidates:  No. of Master' Degrees:  No. of Bachelor's Candidates:  No. of Master' Degrees:  No. of M	Human Research Program Risks:	(1) Muscle: Risk of Impaired Performance	Due to Reduced Muscle Size, Streng	th and Endurance
Discipline: None  Space Biology Special Category: None PI Email: purban@utmb.edu Fax: FY PI Organization Type: UNIVERSITY Phone: 409-772-1176  Organization Name: University of Texas Medical Branch at Galveston PI Address 1: 301 University Blvd. PI Address 2: Rt. 0569 - 4.124 JSA PI Web Page:  City: Galveston State: TX  Zip Code: 77555-0369 Congressional District: 14  Comments: Project Type: GROUND Solicitation / Funding Source: 2009 Crew Health NNJ09ZSA002N Start Date: 07/30/2010 End Date: 07/29/2013  No. of Post Docs: 1 No. of Phab Degrees: No. of Post Docs: 1 No. of Master's Candidates: No. of Master' Degrees: No. of Master's Candidates: No. of Master Degrees: No. of Bachelor's Candidates: No. of Bachelor's Degrees: No. of Bachelor's Candidates: Norsk, Peter Contact Phone: Contact Email: Peter.norsk@nass.gov Flight Program: Flight Assignment: Key Personnel Changes/Previous PI:  COI Name (Institution): Sheffield-Moore, Melinda Ph.D. (University of Texas Medical Branch) Paddon-Jones, Douglas Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch) Paddon-Jones, Douglas Ph.D. (University of Texas Medical Branch) Paddon-Jones, No. NOX10AP86G Performance Goal No.:	Space Biology Element:	None		
PI Email: rurban@utmb.edu Fax: FY Pl Organization Type: UNIVERSITY Phone: 409-772-1176 Organization Name: University of Texas Medical Branch at Galveston PI Address 1: 301 University Blvd. PI Address 2: Rt. 0569 - 4.124 JSA PI Web Page: City: Galveston State: TX Zip Code: 77555-0569 Congressional District: 14 Comments: Project Type: GROUND Solicitation / Funding Source: 2009 Crew Health NNJ09ZSA002N Start Date: 07/30/2010 End Date: 07/29/2013 No. of Post Docs: 1 No. of PhD Degrees: No. of PhD Candidates: No. of Master' Degrees: No. of Master's Candidates: No. of Master' Degrees: No. of Bachelor's Candidates: No. of Bachelor's Degrees: No. of Bachelor's Candidates: No. of Bachelor's Degrees: No. of Bachelor's Candidates: Contact Monitoric Center: NASA JSC Contact Email: Peter.norsk@nasa.gov Flight Program: Flight Assignment: Key Personnel Changes/Previous PI: COI Name (Institution): Sheffield-Moore, Melinda Ph.D. (University of Texas Medical Branch) Paddon-Jones, Douglas Ph.D. (University of Texas Medical Branch) Dilon, Edgar Lichar Ph.D. (University of Texas Medical Branch) Corant/Contract No.: NNX10AP86G Performance Goal No.:		None		
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Organization Name: University of Texas Medical Branch at Galveston  PI Address 1: 301 University Blvd.  PI Address 2: Rt. 0569 - 4.124 JSA  PI Web Page:  City: Galveston State: TX  Zip Code: 77555-0569 Congressional District: 14  Comments:  Project Type: GROUND Solicitation / Funding Source: 2009 Crew Health NNJ09ZSA002N  Start Date: 07/30/2010 End Date: 07/29/2013  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: No. o	PI Email:	rurban@utmb.edu	Fax:	FY
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Zip Code: 77555-0569 Congressional District: 14  Comments:  Project Type: GROUND Solicitation / Funding Source: 2009 Crew Health NNJ09ZSA002N  Start Date: 07/30/2010 End Date: 07/29/2013  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: NASA JSC  Contact Monitor: Norsk, Peter Contact Phone: Contact Email: Peter.norsk@nasa.gov  Flight Program:  Flight Assignment:  Key Personnel Changes/Previous PI:  COI Name (Institution): Durham, William J Ph.D. (University of Texas Medical Branch ) Paddon-Jones, Douglas Ph.D. (University of Texas Medical Branch ) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch ) Grant/Contract No.: NNX10AP86G  Performance Goal No.:	PI Web Page:			
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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:  Norsk, Peter  Contact Phone:  Contact Email:  Peter.norsk@nasa.gov  Flight Program:  Flight Assignment:  Key Personnel Changes/Previous PI:  COI Name (Institution):  Durham, William J Ph.D. (University of Texas Medical Branch) Sheffield-Moore, Melinda Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch)  Grant/Contract No.:  NNX10AP86G  Performance Goal No.:	Start Date:	07/30/2010	End Date:	07/29/2013
No. of Master's Candidates:  No. of Bachelor's Degrees:  No. of Bachelor's Candidates:  Monitoring Center: NASA JSC  Contact Monitor:  Norsk, Peter  Contact Phone:  Contact Email:  Peter.norsk@nasa.gov  Flight Program:  Flight Assignment:  Key Personnel Changes/Previous PI:  COI Name (Institution):  Durham, William J Ph.D. (University of Texas Medical Branch ) Paddon-Jones, Douglas Ph.D. (University of Texas Medical Branch ) Sheffield-Moore, Melinda Ph.D. (University of Texas Medical Branch ) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch ) NNX10AP86G  Performance Goal No.:	No. of Post Docs:	1	No. of PhD Degrees:	
No. of Bachelor's Candidates:  Monitoring Center: NASA JSC  Contact Monitor:  Norsk, Peter  Contact Phone:  Contact Email:  Peter.norsk@nasa.gov  Flight Program:  Flight Assignment:  Key Personnel Changes/Previous PI:  COI Name (Institution):  Durham, William J Ph.D. (University of Texas Medical Branch ) Paddon-Jones, Douglas Ph.D. (University of Texas Medical Branch ) Sheffield-Moore, Melinda Ph.D. (University of Texas Medical Branch ) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch ) NNX10AP86G  Performance Goal No.:	No. of PhD Candidates:		No. of Master' Degrees:	
Contact Monitor:  Norsk, Peter  Contact Phone:  Contact Email:  Peter.norsk@nasa.gov  Flight Program:  Flight Assignment:  Key Personnel Changes/Previous PI:  COI Name (Institution):  Durham, William J Ph.D. (University of Texas Medical Branch ) Paddon-Jones, Douglas Ph.D. (University of Texas Medical Branch ) Sheffield-Moore, Melinda Ph.D. (University of Texas Medical Branch ) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch )  Grant/Contract No.:  NNX10AP86G  Performance Goal No.:	No. of Master's Candidates:		No. of Bachelor's Degrees:	
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Flight Assignment:  Key Personnel Changes/Previous PI:  Durham, William J Ph.D. (University of Texas Medical Branch) Paddon-Jones, Douglas Ph.D. (University of Texas Medical Branch) Sheffield-Moore, Melinda Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch)  WNX10AP86G  Performance Goal No.:	Contact Monitor:	Norsk, Peter	Contact Phone:	
Flight Assignment:  Key Personnel Changes/Previous PI:  COI Name (Institution):  Durham, William J Ph.D. (University of Texas Medical Branch) Paddon-Jones, Douglas Ph.D. (University of Texas Medical Branch) Sheffield-Moore, Melinda Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch)  WNX10AP86G  Performance Goal No.:	Contact Email:	Peter.norsk@nasa.gov		
Key Personnel Changes/Previous PI:  Durham, William J Ph.D. (University of Texas Medical Branch) Paddon-Jones, Douglas Ph.D. (University of Texas Medical Branch) Sheffield-Moore, Melinda Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch)  WNX10AP86G  Performance Goal No.:	Flight Program:			
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COI Name (Institution):  Paddon-Jones, Douglas Ph.D. (University of Texas Medical Branch) Sheffield-Moore, Melinda Ph.D. (University of Texas Medical Branch) Dillon, Edgar Lichar Ph.D. (University of Texas Medical Branch)  NNX10AP86G  Performance Goal No.:	Key Personnel Changes/Previous PI:			
Performance Goal No.:	COI Name (Institution):	Paddon-Jones, Douglas Ph.D. (University Sheffield-Moore, Melinda Ph.D. (University Sheffield-Moore)	y of Texas Medical Branch) rsity of Texas Medical Branch)	
	Grant/Contract No.:	NNX10AP86G		
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Task Book Report Generated on: 04/25/2024

The long-term goal of this proposal is to determine the therapeutic efficacy of testosterone at preserving lean muscle mass, muscle strength, and bone mineral density in healthy humans during spaceflight. We propose to examine the interactive or additive effects of the combination of testosterone and exercise on lean body mass (LBM), muscle strength and bone health. Our general hypothesis is that the maintenance of normal physiologic levels of testosterone during spaceflight will protect against the functional loss of muscle and bone, and will maximize the efficacy of existing resistance exercise protocols at preventing or reversing functional impairments that occur during bed rest.

To achieve these goals we will test the following specific hypotheses before, during and after 70 days of bed rest: 1: Cycled testosterone replacement (weekly testosterone injections for 2 weeks, followed by 2 weeks off, etc.) in conjunction with exercise will have an additive effect in preventing loss of muscle mass and muscle strength in men representative of the astronaut population compared to exercise with placebo testosterone. 2: Cycled testosterone replacement (weekly testosterone injections for 2 weeks, followed by 2 weeks off, etc.) in conjunction with exercise will have an additive effect in preventing loss of bone mass and alterations in markers of bone metabolism in men representative of the astronaut population compared to exercise with placebo testosterone.

**Task Description:** 

To address these hypotheses we will investigate the following specific aims before, during and after 70 days of bed rest: Aim 1: To determine the effect of cycled testosterone replacement in conjunction with resistance exercise during bed rest on muscle mass, muscle strength, and fatigue in men aged 24-55 years. Aim 2: To determine the effect of cycled testosterone replacement in conjunction with resistance exercise during bed rest on markers of bone metabolism and bone mass in men aged 24-55 years

Current evidence suggests that the combination of testosterone and exercise will optimize the effectiveness of the existing exercise and nutritional countermeasures. Results from this proposal will lay the ground work for the implementation of combinational countermeasures that will additively work to maintain preflight physiology of astronauts during long-term spaceflight missions.

Research Impact/Earth Benefits: Results from this study will further elucidate the role of testosterone in the maintenance of skeletal muscle and bone during long term bed rest as a model for space flight. The benefits to life on earth are extensive. It is hypothesized that maintaining appropriate balance between hormonal status, nutritional status, and physical activity during spaceflight is of critical importance in preventing musculoskeletal losses. It is our contention that the restoration of physiologic levels of testosterone is essential to prevent and/or restore spaceflight- and microgravity-induced losses in the musculoskeletal system. Current evidence suggests that the combination of testosterone and exercise will optimize the effectiveness of the existing exercise and nutritional countermeasures.

## Rationale for HRP Directed Research:

Research Impact/Earth Benefits:

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Task Progress:

The protocol was approved by NASA CPHS (Committee for the Protection of Human Subjects) following the May 19, 2011 review and will be included in the 70 day bed rest campaign (Countermeasures and Functional Testing in Head-Down Tilt Bed Rest, CFT70). The first subject is currently scheduled for enrollment June 19, 2011.

**Bibliography Type:** 

Description: (Last Updated: 01/11/2021)