Task Book Report Generated on: 04/19/2024

Pi Name: Prisk, G. Kim Pih.D., D.Se. Project Title: Cleannee of Particles Depositing in the Human Long in Low Gravity Division Name: Human Research Program/Dicipline- Program/Dicipline- Elements' Moderaline- Col Medical Conditions Risk of Adverse Health and Performance Elfects of Celestial Data Exposure (2) Medical Conditions Risk of Adverse Health and Derformance Bifects of Celestial Data Exposure (2) Medical Conditions Risk of Adverse Health and Derformance Elfects of Celestial Data Exposure (3) Medical Conditions Risk of Adverse Health and Derformance Elfects of Celestial Data Exposure (3) Medical Conditions Risk of Adverse Health and Derformance Elfects of Celestial Data Exposure (3) Medical Conditions Risk of Adverse Health and Derformance Elfects of Celestial Data Exposure (3) Medical Conditions Risk of Adverse Health and Derformance Elfects of Celestial Data Exposure (3) Medical Conditions Risk of Adverse Health Moterons and Decements in Performance Data to Medicine (4) Medical Conditions Risk of Adverse Health Moterons and Decements in Performance Data to Medicine (4) Medical Conditions Risk of Adverse Health Moterons and Decements in Performance Data to Medicine (4) Medical Conditions Risk of Adverse Health And Data Risk of Celestial Data to Risk of Performance Data to Medicine (5) Medical Conditions Risk of Adverse Health And Data Risk of Celestial Data to Risk of Performance Data to Medicine (5) Medical Conditions Ri	Fiscal Year:	FY 2008	Task Last Updated:	FY 06/02/2008
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Space Biology Cross-Element Discipline: Space Biology Special Category: None PI Email: kprisk@used.edu Fax: FY 858-534-6046 PI Organization Type: UNIVERSITY Phone: 858-534-3233 Organization Name: University of California, San Diego PI Address 1: Department of Medicine PI Address 2: 9500 Gilman Drive PI Web Page: City: La Jolla State: CA Zip Code: 92093-0852 Congressional District: 53 Comments: Project Type: GROUND Solicitation / Funding Source: 2007 Crew Health NNJ07ZSA002N Start Date: 06*01/2008 End Date: 06*01/2008 No. of Pab Dese: No. of Pab Dese: No. of Master' Degrees: No. of Master' Degrees: No. of Master' Degrees: No. of Master' Scandidates: No. of Master' Scandidates: No. of Bachelor's Candidates: No. of Bachelor's Candidates: No. of Bachelor's Candidates: No. of Bachelor's Candidates: No. of Master' Scandidates: No. of Ma	Human Research Program Risks:	(2) Medical Conditions : Risk of Adverse Health Outcomes and Decrements in Performance Due to Medical Conditions that occur in Mission, as well as Long Term Health Outcomes Due to Mission Exposures		
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PI Organization Type: UNIVERSITY Phone: 858-534-3233 Organization Name: University of California, San Diego PI Address 1: Department of Medicine PI Address 2: 9500 Gilman Drive PI Web Page: City: La Jolla State: CA Zip Code: 9209-0852 Congressional District: 53 Comments: Project Type: GROUND Solicitation / Funding Source: 2007 Crew Health NNJ07ZSA002N Start Date: 06-01/2008 End Date: 05/31/2012 No. of Post Does: No. of PhD Degrees: No. of PhD Candidates: No. of Master' Degrees: 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 Master' Degrees: No. of Master's Candidates: No. of Master' Degrees: No. of Master's Candidates: No. of Master's Degrees: No. of Master's Candidates: No. of Master's Degrees: No. of Master's Degrees: No. of Master's Degrees: No. of Master's Degrees: No. of Master's Candidates: No. of Master's Degrees: No. of Master's Degrees: No. of Master's Candidates: No. of Master's Degrees: No.	Space Biology Special Category:	None		
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The deposition of particulate matter in the human lung is known to bring with it both long-term and short-term adverse health consequences. The deposition of particles in the lung is strongly influenced by gravitational sedimentation. Studies by this group have shown that normal gravity provides a screening effect whereby inhaled particulate matter larger than 0.5 micron is mainly deposited in the larger airways where it is cleared by mucociliary clearance transport within about one day. However, in low gravity, such as that on the surface of the moon (about 1/6 Earth's gravity) and Mars (about 3/8 of Earth's gravity), this protective 'gravitational screening' is less efficient, and as a result, particles are deposited in the sensitive alveolar regions of the lung where residence times are much longer. Further, there is evidence that the dust on the surface of the moon may possess potent toxicological properties.

We hypothesize that clearance rates from the lung of particles deposited in low gravity will be substantially reduced

Task Description:

compared to that in normal gravity, resulting in increased residence times of these particles in the periphery of the lung, enhancing their potential to cause lung damage.

To test this hypothesis, we will measure the clearance rates (measured in normal gravity) over a few hours to about 1-2 days, of radio-labeled particles deposited in healthy humans both in normal and in low gravity corresponding to the lunar surface during parabolic flight. These data will provide a comprehensive assessment of alterations in the clearance

days, of radio-labeled particles deposited in healthy humans both in normal and in low gravity) over a few hours to about 1-2 days, of radio-labeled particles deposited in healthy humans both in normal and in low gravity corresponding to the lunar surface during parabolic flight. These data will provide a comprehensive assessment of alterations in the clearance rate of particles inhaled under normal gravity conditions compared to particles inhaled under conditions of lunar gravity. Such an assessment is needed to determine the degree of effort and cost required to control lunar dust within a planned lunar outpost.

Rationale for HRP Directed Research:

Research Impact/Earth Benefits:

Task Progress:

New project for FY2008.

Bibliography Type:

Description: (Last Updated: 03/11/2021)