

Fiscal Year:	FY 2016	Task Last Updated:	FY 11/30/2015
PI Name:	Mishra, Birendra D.V.M., Ph.D.		
Project Title:	Effects of Charged Particles on the Uterus		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:	NSBRI--Radiation Effects Team		
Joint Agency Name:	TechPort:	No	
Human Research Program Elements:	None		
Human Research Program Risks:	None		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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Zip Code:	92617-3055	Congressional District:	45
Comments:			
Project Type:	GROUND	Solicitation / Funding Source:	2015 NSBRI-RFA-15-01 First Award Fellowships
Start Date:	11/01/2015	End Date:	10/31/2016
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):	Luderer, Ulrike M.D., Ph.D. (MENTOR/ University of California, Irvine)		
Grant/Contract No.:	NCC 9-58-PF04302		
Performance Goal No.:			
Performance Goal Text:			
Task Description:	<p>POSTDOCTORAL FELLOWSHIP</p> <p>In NASA space missions about 15% of astronauts are women, and women made up half of the 2013 NASA Astronaut Class. However, risks of uterine exposure to galactic cosmic rays and solar particle events during space missions remain completely unknown. Normal uterine structure and function is required for a healthy pregnancy and optimal development and subsequent health of the offspring. Uterine function in adults is largely regulated by ovarian steroid hormones secreted from the growing pool of follicles. Our preliminary data generated under a NASA pilot grant showed that Iron (56Fe) charged particle radiation induces apoptosis and destroys ovarian follicles in mice. Radiotherapy for the treatment of cancer in pelvic region has been shown to damage uterine cells, reduce blood circulation to the uterus, and increase the risk for miscarriage, low-birth weight, and premature birth. In addition, pelvic irradiation for cancer treatment is associated with higher risk of uterine cancer. Female atomic bomb survivors have increased risk of uterine</p>		

leiomyoma (fibroid). We therefore hypothesize that high charge and energy (HZE) particles (Iron or Oxygen) typical of space radiation alter uterine function and contribute to the pathogenesis of uterine leiomyoma and cancer. To test the hypotheses, three month old female mice will be irradiated with charged iron or oxygen particles. In situ detection of uterine cell morphology, DNA double strand break, apoptosis, pregnancy outcome, and uterine pathogenicity will be determined. This proposal will provide preliminary findings for further detailed studies and formulation for necessary remedies associated with risk of uterine exposure.

Rationale for HRP Directed Research:**Research Impact/Earth Benefits:****Task Progress:**

New project for FY2016.

Bibliography Type:

Description: (Last Updated: 06/22/2020)