

<b>Fiscal Year:</b>	FY 2014	<b>Task Last Updated:</b>	FY 08/26/2013
<b>PI Name:</b>	Parsons-Wingerter, Patricia Ph.D.		
<b>Project Title:</b>	Mapping by VESGEN of Blood Vessels in the Human Retina Undergoing Bed Rest for Improved Understanding of Visual Impairments and Increased Intracranial Pressure		
<b>Division Name:</b>	Human Research		
<b>Program/Discipline:</b>	HUMAN RESEARCH		
<b>Program/Discipline--Element/Subdiscipline:</b>	HUMAN RESEARCH--Biomedical countermeasures		
<b>Joint Agency Name:</b>		<b>TechPort:</b>	No
<b>Human Research Program Elements:</b>	(1) <b>HHC:</b> Human Health Countermeasures		
<b>Human Research Program Risks:</b>	(1) <b>SANS:</b> Risk of Spaceflight Associated Neuro-ocular Syndrome (SANS)		
<b>Space Biology Element:</b>	None		
<b>Space Biology Cross-Element Discipline:</b>	None		
<b>Space Biology Special Category:</b>	None		
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<b>Zip Code:</b>	94035-1000	<b>Congressional District:</b>	18
<b>Comments:</b>	NOTE: Formerly at NASA Glenn Research Center until summer 2014		
<b>Project Type:</b>	GROUND	<b>Solicitation / Funding Source:</b>	2012 Crew Health NNJ12ZSA002N
<b>Start Date:</b>	10/01/2013	<b>End Date:</b>	09/22/2015
<b>No. of Post Docs:</b>		<b>No. of PhD Degrees:</b>	
<b>No. of PhD Candidates:</b>		<b>No. of Master' Degrees:</b>	
<b>No. of Master's Candidates:</b>		<b>No. of Bachelor's Degrees:</b>	
<b>No. of Bachelor's Candidates:</b>		<b>Monitoring Center:</b>	NASA JSC
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<b>Flight Program:</b>			
<b>Flight Assignment:</b>	NOTE: End date changed to 9/22/2015 (originally 9/30/2014), per R. Brady/HRP (Ed., 7/17/14) NOTE: Gap change per IRP Rev E (Ed., 3/19/14)		
<b>Key Personnel Changes/Previous PI:</b>			
<b>COI Name (Institution):</b>	Vizzeri, Gianmarco M.D. ( University of Texas Medical Branch )		
<b>Grant/Contract No.:</b>	Internal Project		
<b>Performance Goal No.:</b>			
<b>Performance Goal Text:</b>			

<b>Task Description:</b>	Accelerated, high-priority NASA studies recently established that the adverse effects of cephalad fluid shifts incurred by microgravity spaceflight, especially by long-duration missions, are associated with significant risks for ocular and visual impairments and increased intracranial pressure (VIIP), including decreased near visual acuity, choroidal flattening and optic disc edema (papilledema). However, much remains to be learned about the etiology of VIIP before effective countermeasures can be developed. Contributions of remodeling retinal blood vessels to the etiology of VIIP have not yet been investigated, primarily due to the current lack of ophthalmic tools for precisely measuring progressive remodeling of the vascular architecture. We hypothesize that the fluid shifts resulting in VIIP ocular and visual impairments are mediated in part by the retinal blood vessels, and that such vascular involvement requires the significant, progressive remodeling of retinal vascular architecture. To test our hypothesis, retinal blood vessels will be mapped and quantified using the innovative VESSEL GENeration Analysis (VESGEN), a mature, beta-level software developed at NASA as a translational and basic research discovery tool for biomedical vascular applications, particularly for retinal vascular disease. Modified retinal vascular patterning may provide early prediction of future decreased visual acuity. Novel insights provided by VESGEN into progressively pathological and blinding vascular remodeling in the human retina are currently guiding other NIH- and NASA-supported therapeutic development for retinal disease and modeling of the VIIP risk. Our new VESGEN project addressing the VIIP risk will be conducted as a straightforward add-on study that synergistically leverages ophthalmic clinical imaging currently scheduled for ongoing bed rest studies at NASA Johnson Space Center (JSC). The VESGEN analysis can also be applied to ophthalmic images of astronauts undergoing long-duration spaceflight, should such images become available.
<b>Rationale for HRP Directed Research:</b>	
<b>Research Impact/Earth Benefits:</b>	
<b>Task Progress:</b>	New project for FY2014.
<b>Bibliography Type:</b>	Description: (Last Updated: 11/30/2021)