Fiscal Year:	FY 2015	**Task Last Updated:**	FY 10/27/2014
PI Name:	Koppelmans, Vincent Ph.D.		
Project Title:	Exercise Effects on Central Nervous System Function and Structure in Bed Rest (Postdoctoral Fellowship)		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:	NSBRI--Sensorimotor Adaptation 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		
PI Email:	vkoppel@umich.edu	**Fax:**	FY
PI Organization Type:	UNIVERSITY	**Phone:**	734-615-5155
Organization Name:	University of Michigan		
PI Address 1:	401 Washtenaw Avenue		
PI Address 2:			
PI Web Page:			
City:	Ann Arbor	**State:**	MI
Zip Code:	48109-2208	**Congressional District:**	12
Comments:			
Project Type:	GROUND	**Solicitation:**	2014 NSBRI-RFA-14-02 First Award Fellowships
Start Date:	11/01/2014	**End Date:**	10/31/2016
No. of Post Docs:		**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):	Seidler, Rachael Ph.D. (MENTOR/ University of Michigan)		
Grant/Contract No.:	NCC 9-58-PF04101		
Performance Goal No.:			
Performance Goal Text:			
	POSTDOCTORAL FELLOWSHIP Spaceflight has been associated with problems with gait, balance, and cognition. Preventing these dysfunctions is important in terms of crew health and success of space missions. These adverse effects of spaceflight likely have a central nervous system component considering that microgravity in space causes increased intracranial pressure and is associated with stress, sleep loss, and altered sensory inputs, all of which could affect the brain. Long-duration bed rest has proven to be a good model to study the effects of microgravity on motor performance. Two 70-days bed rest studies with pre, during, and post assessments that are currently being conducted focus on: 1) cognition, sensorimotor performance, and the brain using behavioral tests and MRI; and 2) how exercise might counteract microgravity-induced changes in physical fitness, by comparing exercise and control subjects on fitness outcome measures. These studies are being conducted simultaneously using the same subjects. Preliminary results show that bed rest affects motor function		

Task Description:	and brain structure, and that exercise partially reduces these effects. This corroborates with multiple studies showing that aerobic exercise has a positive effect on cognition and brain structure. The existing literature and our preliminary results thus support the idea that exercise has a preventive and/or counteractive effect on microgravity-induced sensorimotor, cognitive, and brain functional and structural changes. With the here proposed research we therefore aim to combine data of the two above-described bed rest studies to formally investigate exercise as preventive/countermeasure for microgravity-induced cognitive, sensorimotor, brain functional and structural changes. This goal is very feasible considering that the data is already being collected and likely to be successful considering the promising preliminary results. Moreover, it would be an efficient endeavor because it addresses several gaps of NASA's Human Research Roadmap at once and will aid to ensure the health of humans living and working in space.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	0
Task Progress:	New project for FY2015.
Bibliography Type:	Description: (Last Updated: 05/16/2019)