Task Book Report Generated on: 04/26/2024

Priser: Dinges, David F. Ph.D. Project Title: Marker of Succeptibility to Neurobehavioral Decrements in Space Flight  Bickion Name: Human Research Program/Bicipline: NSBRI Program/Bicipline: NSBRI-Neurobehavioral and Psychococial Factors Team  Human Research Program Elements: (1) BHP-Behavioral Health & Performance (urchival in 2017)  Human Research Program Elements: (1) BHP-Behavioral Health & Performance (urchival in 2017)  Human Research Program Risks: (1) BHP-Behavioral Health & Performance (urchival in 2017)  Human Research Program Risks: (1) BHP-Behavioral Health & Performance (urchival in 2017)  Human Research Program Risks: (1) BHP-Behavioral Health & Performance (urchival in 2017)  Human Research Program Risks: (1) BHP-Behavioral Health & Performance (urchival in 2017)  Human Research Program Risks: (1) BHP-Behavioral Health & Performance (urchival in 2017)  Human Research Program Risks: (1) BHP-Behavioral Health & Performance (urchival in 2017)  Human Research Program Risks: (1) BHP-Behavioral Health & Performance (urchival in 2017)  Human Research Program Risks: (1) BHP-Behavioral Health & Performance (urchival in 2017)  Human Research Program Risks: (1) BHP-Behavioral Health & Performance (urchival in 2017)  None Bhotalogy Special Category: None  PI Carginarian Type: University of Permydomia Phone: 1 Sassa Pyshare Phone: 215-898-9940  Department of Program Risks: (1) BHP-Behavioral Phone: 215-898-9940  Department of Program State: PA 235 Service Dr., 1013 Blockley Hall  PI Address 1: Department of Psychiatry  PI Address 2: A 235 Service Dr., 1013 Blockley Hall  PI Web Page:  City: Phone: State Phone: 215-898-9940  Connectis: Physical Program State Phone: 215-898-9940  Connectis: Physical Risks Phone Phone Phone Phone Phone Phone Phone: 215	Figual Vacan	EV 2015	Tools Year IV. J. ( )	EV 10/14/2014
Project Title: Markers of Susceptibility to Neurobehavioral Decrements in Space Flight    Division Name: Human Research	Fiscal Year:	FY 2015	Task Last Updated:	FY 10/14/2014
Design Name:   Human Research   NSBR    Program/Discipline:   NSBR				
Program/Discipline: Program/Discipline- Element/Subdiscipline: NSBRI-Neurobehavioral and Psychosocial Factors Team Element/Subdiscipline: Joint Agency Name: TechPort: No Human Research Program Elements: (1) BHPRehavioral Health & Performance (archival in 2017) Human Research Program Kisks: (1) BMcRisk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders Space Biology Cross-Element None Space Biology Cross-Element Discipline: None Space Biology Special Category: None PI Email: disagos@peramedisine upons obst Health & Fax: FY Pl Organization Type: UNIVERSITY Phone: 215-898-9949 Organization Name: University of Pemsylvania PI Address 1: PI Address 2: PI Address 2: PI Space Biology Special Category: PI More Program Kisks: Agriculture of Psychiatry PI Address 3: PI Address 3: PI Address 3: PI Address 4: PI Address 4: PI Address 5: Poperument of Psychiatry PI Address 5: PI Address 6: PI Web Page: City: Piniadelphia State: PA  Zip Code: Diplu-4209 Congressional District: Comments: Project Type: GROUND Sulicitation / Funding 2011 Cross Health Source: NUITESA002NA Shart Date: 1001/2012 End Date: 0603/2016 No. of Pab Degrees: No. of Master's Candidates: No. of Master's Candidates: No. of Master's Candidates: No. of Bachelor's Candidates: No. of Ba	Project Title:	Markers of Susceptibility to Neurobehavio	ral Decrements in Space Flight	
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Element/Subdiscipline: Joint Agency Name: Joint Agency Name:  (1) BHP.Bchavioral Health & Performance (archival in 2017)  Human Research Program Elements: (1) BMed:Risk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders  Space Biology Element: None  Space Biology Cross-Element Bone Space Biology Special Category: None  Pt Email:    Department   Program Risk   Program Risk	Program/Discipline:	NSBRI		
Human Research Program Elements: (1) BHFBchavioral Health & Performance (archival in 2017)  Human Research Program Risks: (1) BMed-Risk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders  Space Biology Cross-Element	Program/Discipline Element/Subdiscipline:	NSBRINeurobehavioral and Psychosocia	ıl Factors Team	
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Space Biology Cross-Element Discipline: Space Biology Special Category: None PI Email: dinessizemanusclicine lupon cell PI Camait: dinessizemanusclicine lupon cell PI Email: dinessizemanusclicine lupon cell PI Email: dinessizemanusclicine lupon cell PI Caraitation Type: UNIVERSITY Phone: 215-898-9949 Organization Type: University of Pennsylvania PI Address 1: Department of Psychiatry PI Address 2: 423 Service Dr., 1013 Blockley Hall PI Web Page: City: Philadelphia State: PA Zip Code: Di 104-4209 Congressional District: 2 Comments: Project Type: GROUND Solicitation / Funding Source: NNII17SA002NA Start Date: 10012012 End Date: 06302016 No. of Phot Degres: 1 No. of Phot Degres: 1 No. of Phot Descres: 1 No. of Phot Degres: 1 No. of Master' Degrees: 0 No. of Master' Degrees: 0 No. of Master' Candidates: 1 No. of Bachelor's Degrees: 0 No. of Bachelor's Contact Monitor: Contact Email: Flight Program:  NOTE: End date change to 6/30/2016 per NSBRI [Ed., 3/1/16) NOTE: End date change to 3/31/2016 per NSBRI submission October 2013 [Ed., 10/16/13) NOTE: End date change to 3/31/2016 per NSBRI submission October 2013 [Ed., 10/16/13) NOTE: End date change do ack to 9/30/2015 per NSBRI submission October 2013 [Ed., 10/16/13) NOTE: Criginal end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI: COI Name (Institution): Rough Programmal (Stanford University School of Medicine ) NCC 9-58-NBPF02801	Human Research Program Risks:	(1) <b>BMed</b> :Risk of Adverse Cognitive or Be	ehavioral Conditions and Psychiatric Disord	lers
Discipline: None  Space Biology Special Category: None  PI Email: diness@nennmedicine.unean.edu Fax: FY  PI Organization Type: UNIVERSITY Phone: 215-898-9949  Organization Name: University of Pennsylvania  PI Address 1: Department of Psychiatry  PI Address 2: 423 Service Dr., 1013 Blockley Hall  PI Web Page:  City: Philadelphia State: PA  Zip Code: 19104-4209 Congressional District: 2  Comments:  Project Type: GROUND Solicitation / Funding 2011 Crew Health Source: NNU11ZSA00ZNA  Start Date: 1001/2012 End Date: 0630/2016  No. of PhD Candidates: 1 No. of PhD Degrees: 1  No. of PhD Candidates: 1 No. of Master's Candidates: 0 No. of Bachelor's 0 Degrees: 0  No. of Bachelor's Candidates: 0 Monitoring Center: NSBRI  Contact Monitor: Contact Phone:  Contact Monitor: Contact Phone:  Flight Program:  NOTE: End date change to 6/30/2016 per NSBRI (Ed., 3/116)  NOTE: End date change to 3/31/2016 per NSBRI (Ed., 3/106)  NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  COI Name (Institution): General NCC 9-58-NBPF02801  Performance Goal No.:	Space Biology Element:	None		
PI Email: dinges@penmedicine.apenn.edu Fax: FY PI Organization Type: UNIVERSITY Phone: 215-898-9949 Organization Name: University of Pennsylvania PI Address 1: Department of Psychiatry PI Address 2: 423 Service Dr., 1013 Blockley Hall PI Address 2: 423 Service Dr., 1013 Blockley Hall PI Web Page: City: Philadelphia State: PA Zip Code: 19104-4209 Congressional District: 2 Comments: Project Type: GROUND Solicitation / Funding 2011 Crew Health Source: NNTI IZSA002NA Start Date: 1001/2012 End Date: 06/30/2016 No. of Post Does: 1 No. of Phab Degrees: 1 No. of PhD Candidates: 1 No. of Master' Degrees: 0 No. of Master's Candidates: 0 No. of Master' Degrees: 0 No. of Master's Candidates: 0 Monitoring Center: NSBRI Contact Monitor: Contact Phone: Contact Monitor: Contact Phone:  Contact Monitor: NOTE: End date change to 6/30/2016 per NSBRI (Ed., 9/30/15) NOTE: End date change to 9/30/2015 per NSBRI submission October 2013 (Ed., 10/16/13) NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  COI Name (Institution): Goel, Namni (University of Pennsylvania ) Basner, Mathias (University of Pennsylvania )	Space Biology Cross-Element Discipline:	None		
PF Organization Type: UNIVERSITY Phone: 215-898-9949 Organization Name: University of Pennsylvania PF Address 1: Department of Psychiatry PF Address 2: 423 Service Dr., 1013 Blockley Hall PF Web Page: City: Philadelphia State: PA Zip Code: 19104-4209 Congressional District: 2 Comments:  Project Type: GROUND Solicitation / Funding 2011 Crew Health NNI/1E/SA002NA Start Date: 1001/2012 End Date 0/630/2016 No. of Post Docs: 1 No. of Phib Degrees: 1 No. of Phib Degrees: 1 No. of Phib Degrees: 1 No. of Master's Candidates: 0 No. of Master' Degrees: 0 No. of Bachelor's Candidates: 0 No. of Bachelor's Condidates: 0 No. of Bachelor's Condidates: 0 No. of Bachelor's Condidates: No. of Bachelor's C	Space Biology Special Category:	None		
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Pl Address 1:   Department of Psychiatry	PI Organization Type:	UNIVERSITY	Phone:	215-898-9949
PI Address 2: 423 Service Dr., 1013 Blockley Hall  PI Web Page:  City: Philadelphia State: PA  Zip Code: 19104-4209 Congressional District: 2  Comments:  Project Type: GROUND Solicitation / Funding 2011 Crew Health Source: NNJ11ZSA002NA  Start Date: 1001/2012 End Date: 06/30/2016  No. of Post Docs: 1 No. of PhD Degrees: 1  No. of PhD Candidates: 1 No. of Master' Degrees: 0  No. of Master's Candidates: 0 No. of Master' Degrees: 0  No. of Bachelor's Candidates: 0 Monitoring Center: NSBRI  Contact Honitor: Contact Honitor:  Contact Email:  Flight Program:  NOTE: End date change to 6/30/2016 per NSBRI (Ed., 3/1/16)  NOTE: End date change to 3/31/2016 per NSBRI (Ed., 9/30/15)  NOTE: End date change dack to 9/30/2015 per NSBRI submission October 2013 (Ed., 10/16/13)  NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  COI Name (Institution): Solo, Nami (University of Pennsylvania)  Mollicone, Daniel (Pulsar Informatics, Inc.)  Rao, Hengyi (University of Pennsylvania)  Masaer, Mathias (University of Pennsylvania)  Mignot, Emmanuel (Stanford University School of Medicine)  Grant/Contract No.: NCC 9-58-NBPF02801	Organization Name:	University of Pennsylvania		
PI Web Page:  City: Philadelphia State: PA  Zip Code: 19104-4209 Congressional District: 2  Comments:  Project Type: GROUND Solicitation / Funding Source: NNJ11ZSA002NA  Start Date: 10/01/2012 End Date: 06/30/2016  No. of PbD Congressional District: 10/01/2012 End Date: 06/30/2016  No. of PbD Congressional District: 10/01/2012 End Date: 06/30/2016  No. of PbD Congressional District: 10/01/2012 End Date: 06/30/2016  No. of PbD Condidates: 1 No. of Master' Degrees: 1  No. of Master's Candidates: 0 No. of Master' Degrees: 0  No. of Master's Candidates: 0 Monitoring Center: NSBRI  Contact Monitor: Contact Phone:  Contact Monitor: Contact Phone:  Contact Phone: NSBRI (Ed., 31/16)  NOTE: End date change to 6/30/2016 per NSBRI (Ed., 31/16)  NOTE: End date change back to 9/30/2015 per NSBRI submission October 2013 (Ed., 10/16/13)  NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  COI Name (Institution): Root, Damiel (University of Pennsylvania) Moliticone, Damiel (Pulsar Informatics, Inc.)  Rao, Hengyi (University of Pennsylvania) Megno, Emmanuel (Sanford University School of Medicine)  Grant/Contract No.: NCC 9-58-NBPF02801	PI Address 1:	Department of Psychiatry		
City: Philadelphia State: PA  Zip Code: 19104-4209 Congressional District: 2  Comments:  Project Type: GROUND Solicitation / Funding Source: NN111ZSA00ZNA  Start Date: 10/01/2012 End Date: 06/30/2016  No. of Post Docs: 1 No. of PhD Degrees: 1  No. of PhD Candidates: 1 No. of Master' Degrees: 0  No. of Master's Candidates: 0 No. of Master' Degrees: 0  No. of Master's Candidates: 0 Monitoring Center: NSBRI  Contact Monitor: Contact Phone:  Contact Hamil:  Flight Program:  NOTE: End date change to 6/30/2016 per NSBRI (Ed., 3/1/16)  NOTE: End date change to 3/31/2016 per NSBRI submission October 2013 (Ed., 10/16/13)  NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  COI Name (Institution): Sasane, Mathias (University of Pennsylvania ) Basner, Mathias (University of Pennsylvania ) Mognot, Emmanuel (Stanford University School of Medicine)  Grant/Contract No.: NCC 9-58-NBPF02801	PI Address 2:	423 Service Dr., 1013 Blockley Hall		
To   Code:   19104-4209   Congressional District:   2	PI Web Page:			
Comments:  Project Type:  GROUND  GROUND  Solicitation / Funding 2011 Crew Health Source: NNJ11ZSA002NA  Start Date: 10/01/2012  End Date: 06/30/2016  No. of Post Does: 1  No. of PhD Candidates: 1  No. of PhD Candidates: 1  No. of Master' Degrees: 0  No. of Master's Candidates: 0  No. of Bachelor's Objected by Degrees: 0  No. of Bachelor's Candidates: 0  Monitoring Center: NSBRI  Contact Monitor: Contact Phone:  Contact Email:  Flight Program:  NOTE: End date change to 6/30/2016 per NSBRI (Ed., 3/1/16)  NOTE: End date change to 3/31/2016 per NSBRI (Ed., 9/30/15)  NOTE: End date change to 6/30/2015 per NSBRI submission October 2013 (Ed., 10/16/13)  NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  COI Name (Institution):  Goel, Namni (University of Pennsylvania)  Mollicone, Daniel (Pulsar Informatics, Inc.)  Rao, Hengyi (University of Pennsylvania)  Mignot, Emmanuel (Stanford University School of Medicine)  Grant/Contract No.: NCC 9-58-NBPF02801  Performance Goal No.:	City:	Philadelphia	State:	PA
Project Type: GROUND Solicitation / Funding 2011 Crew Health Source: NNJ11ZSA002NA  Start Date: 10/01/2012 End Date: 06/30/2016  No. of Post Docs: 1 No. of PhD Degrees: 1  No. of PhD Candidates: 1 No. of Master' Degrees: 0  No. of Master's Candidates: 0 No. of Bachelor's Degrees: 0  No. of Bachelor's Candidates: 0 Monitoring Center: NSBRI  Contact Monitor: Contact Phone:  Contact Email:  Flight Program:  NOTE: End date change to 6/30/2016 per NSBRI (Ed., 3/1/16)  NOTE: End date change to 3/31/2016 per NSBRI (Ed., 9/30/15)  NOTE: End date change to 9/30/2015 per NSBRI (Ed., 9/30/15)  NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  COI Name (Institution): Society of Pennsylvania Mignot, Emmanuel (Stanford University of Pennsylvania) Mignot, Emmanuel (Stanford University School of Medicine)  Grant/Contract No.: NCC 9-58-NBPF02801  Performance Goal No.:	Zip Code:	19104-4209	Congressional District:	2
Start Date: 10/01/2012 End Date: 06/30/2016  No. of Post Docs: 1 No. of PhD Degrees: 1  No. of PhD Candidates: 1 No. of Master' Degrees: 0  No. of Master's Candidates: 0 No. of Bachelor's Degrees: 0  No. of Bachelor's Candidates: 0 Monitoring Center: NSBRI  Contact Monitor: Contact Phone:  Contact Email:  Flight Program:  NOTE: End date change to 6/30/2016 per NSBRI (Ed., 3/1/16) NOTE: End date change to 3/31/2016 per NSBRI (Ed., 9/30/15)  NOTE: Original end date was 9/30/2015 per NSBRI (Ed., 9/30/15)  NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  COI Name (Institution): Goel, Namni (University of Pennsylvania) Mollicone, Daniel (Pulsar Informatics, Inc.) Basner, Mathias (University of Pennsylvania) Mignot, Emmanuel (Stanford University School of Medicine)  Grant/Contract No.: NCC 9-58-NBPF02801  Performance Goal No.:	Comments:			
No. of Post Docs:  1 No. of PhD Candidates:  1 No. of Master' begrees:  1 No. of Master's Candidates:  0 No. of Master's Candidates:  0 Monitoring Center:  No. of Bachelor's Candidates:  0 Monitoring Center:  Contact Monitor:  Contact Phone:  Contact Email:  Flight Program:  NOTE: End date change to 6/30/2016 per NSBR1 (Ed., 3/1/16) NOTE: End date change to 3/31/2016 per NSBR1 (Ed., 9/30/15)  NOTE: End date change to 9/30/2015 per NSBR1 (Ed., 9/30/15)  NOTE: Original end date was 9/30/2015 per NSBR1 submission October 2013 (Ed., 10/16/13) NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBR1 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  COI Name (Institution):  Goel, Namni (University of Pennsylvania) Basner, Mathias (University of Pennsylvania) Basner, Mathias (University School of Medicine)  Grant/Contract No.:  NCC 9-58-NBPF02801  Performance Goal No.:	Project Type:	GROUND		
No. of PhD Candidates:  1	Start Date:	10/01/2012	End Date:	06/30/2016
No. of Master's Candidates:  No. of Bachelor's Obegrees:  No. of Bachelor's Candidates:  No. of Bachelor's Obegrees:  No. of Bachelor's Candidates:  No. of Bachelor's Candidates:  No. of Bachelor's Candidates:  No. of Bachelor's Candidates:  Nother Ca	No. of Post Docs:	1	No. of PhD Degrees:	1
No. of Bachelor's Candidates:  No. of Bachelor's Candidates:  Contact Monitoring Center: NSBRI  Contact Email:  Flight Program:  NOTE: End date change to 6/30/2016 per NSBRI (Ed., 3/1/16) NOTE: End date change to 3/31/2016 per NSBRI (Ed., 9/30/15)  NOTE: End date change to 3/31/2016 per NSBRI submission October 2013 (Ed., 10/16/13)  NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  Goel, Namni (University of Pennsylvania) Mollicone, Daniel (Pulsar Informatics, Inc.) Rao, Hengyi (University of Pennsylvania) Mignot, Emmanuel (Stanford University School of Medicine)  Grant/Contract No.:  NCC 9-58-NBPF02801  Performance Goal No.:	No. of PhD Candidates:	1	No. of Master' Degrees:	0
Contact Monitor:  Contact Email:  Flight Program:  NOTE: End date change to 6/30/2016 per NSBRI (Ed., 3/1/16) NOTE: End date change to 3/31/2016 per NSBRI (Ed., 9/30/15)  NOTE: End date change to 3/31/2016 per NSBRI (Ed., 9/30/15)  NOTE: End date change back to 9/30/2015 per NSBRI submission October 2013 (Ed., 10/16/13) NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  COI Name (Institution):  Goel, Namni (University of Pennsylvania) Mollicone, Daniel (Pulsar Informatics, Inc.) Rao, Hengyi (University of Pennsylvania) Basner, Mathias (University of Pennsylvania) Mignot, Emmanuel (Stanford University School of Medicine)  Grant/Contract No.:  NCC 9-58-NBPF02801	No. of Master's Candidates:	0	No. of Bachelor's Degrees:	0
Contact Email:  Flight Program:  NOTE: End date change to 6/30/2016 per NSBRI (Ed., 3/1/16) NOTE: End date change to 3/31/2016 per NSBRI (Ed., 9/30/15)  NOTE: End date change to 3/31/2016 per NSBRI (Ed., 9/30/15)  NOTE: End date changed back to 9/30/2015 per NSBRI submission October 2013 (Ed., 10/16/13) NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  COI Name (Institution):  Goel, Namni (University of Pennsylvania) Mollicone, Daniel (Pulsar Informatics, Inc.) Rao, Hengyi (University of Pennsylvania) Basner, Mathias (University of Pennsylvania) Mignot, Emmanuel (Stanford University School of Medicine)  Grant/Contract No.:  NCC 9-58-NBPF02801  Performance Goal No.:	No. of Bachelor's Candidates:	0	<b>Monitoring Center:</b>	NSBRI
Flight Program:  NOTE: End date change to 6/30/2016 per NSBRI (Ed., 3/1/16) NOTE: End date change to 3/31/2016 per NSBRI (Ed., 9/30/15)  NOTE: End date changed back to 9/30/2015 per NSBRI submission October 2013 (Ed., 10/16/13) NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  Goel, Namni (University of Pennsylvania) Mollicone, Daniel (Pulsar Informatics, Inc.) Rao, Hengyi (University of Pennsylvania) Basner, Mathias (University of Pennsylvania) Mignot, Emmanuel (Stanford University School of Medicine)  Grant/Contract No.:  NCC 9-58-NBPF02801  Performance Goal No.:	Contact Monitor:		Contact Phone:	
NOTE: End date change to 6/30/2016 per NSBRI (Ed., 3/1/16) NOTE: End date change to 3/31/2016 per NSBRI (Ed., 9/30/15)  NOTE: End date changed back to 9/30/2015 per NSBRI submission October 2013 (Ed., 10/16/13) NOTE: Original end date was 9/30/2015; Changed to 9/30/13 per NSBRI 6/2/2012 (Ed., 6/4/12)  Key Personnel Changes/Previous PI:  Goel, Namni (University of Pennsylvania) Mollicone, Daniel (Pulsar Informatics, Inc.) Rao, Hengyi (University of Pennsylvania) Basner, Mathias (University of Pennsylvania) Mignot, Emmanuel (Stanford University School of Medicine)  Grant/Contract No.:  NCC 9-58-NBPF02801  Performance Goal No.:	Contact Email:			
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Key Personnel Changes/Previous PI:  Goel, Namni (University of Pennsylvania) Mollicone, Daniel (Pulsar Informatics, Inc.) Rao, Hengyi (University of Pennsylvania) Basner, Mathias (University of Pennsylvania) Mignot, Emmanuel (Stanford University School of Medicine)  Grant/Contract No.:  NCC 9-58-NBPF02801  Performance Goal No.:	Flight Assignment:	NOTE: End date changed back to 9/30/2015 per NSBRI submission October 2013 (Ed., 10/16/13)		
Goel, Namni (University of Pennsylvania) Mollicone, Daniel (Pulsar Informatics, Inc.) Rao, Hengyi (University of Pennsylvania) Basner, Mathias (University of Pennsylvania) Mignot, Emmanuel (Stanford University School of Medicine)  Grant/Contract No.: NCC 9-58-NBPF02801  Performance Goal No.:		NOTE: Original end date was 9/30/2015; O	Changed to 9/30/13 per NSBRI 6/2/2012 (Ed	d., 6/4/12)
Mollicone, Daniel (Pulsar Informatics, Inc.) Rao, Hengyi (University of Pennsylvania) Basner, Mathias (University of Pennsylvania) Mignot, Emmanuel (Stanford University School of Medicine)  MCC 9-58-NBPF02801  Performance Goal No.:	Key Personnel Changes/Previous PI:			
Performance Goal No.:	COI Name (Institution):	Mollicone, Daniel (Pulsar Informatics, Inc.) Rao, Hengyi (University of Pennsylvania) Basner, Mathias (University of Pennsylvania)		
	Grant/Contract No.:	NCC 9-58-NBPF02801		
Performance Goal Text:	Performance Goal No.:			
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Task Book Report Generated on: 04/26/2024

This project is responsive to the NSBRI Neurobehavioral and Psychosocial Factors Team goal to validate objective markers of susceptibility to stress, fatigue, and neurobehavioral decrements associated with long-duration space flight, and to the NASA HRP Behavioral Health and Performance gap to find individual characteristics that predict successful adaptation and performance in an isolated, confined, and extreme environments, especially for long duration missions. Sleep loss is common in space flight but there are currently no valid objective markers of the large inter-individual differences in susceptibility to its neurobehavioral effects. To fill this gap, the project will validate promising novel markers of susceptibility to fatigue-related neurobehavioral decrements.

The project consists of two discrete specific Aims. Specific Aim 1 will identify core dimensions of neurobehavioral responses to both chronic partial and acute sleep loss. This will be achieved by conducting a factor analysis of a historical database of cognitive, subjective, and physiological responses to acute and chronic sleep loss in healthy adults (N=640). The historical data will be separated into two groups, one group of N=175 subjects studied during total sleep deprivation (TSD) and a second group of N=465 subjects studied during chronic partial sleep deprivation (PSD). The primary outcomes to determine the core dimensions of responses to sleep loss for both groups include performance on the Psychomotor Vigilance Test (PVT), Digit Symbol Substitution Task, Digit Span, Tower of London, and subjective ratings of mood, sleepiness, and tiredness through the Profile of Mood States, Visual Analog Scales of Fatigue and Tiredness, and Karolinska Sleepiness Scale. These dimensions will then serve as targets for prospectively assessing the predictive power (separately and in combination) of each of five objective markers that include physiological (brain activity, heart rate variability, salivary amylase), behavioral (time on task performance), and genetic (common polymorphisms) measures for susceptibility to neurobehavioral responses to sleep loss. Specifically, the five biomarkers are: (1) Resting arterial spin labeling (ASL fMRI) cerebral blood flow without sleep deprivation; (2) Resting psychomotor vigilance test (PVT) time on task (TOT) without sleep deprivation; (3) Heart rate variability (HRV) during PVT TOT; (4) Salivary a-amylase activity (sAA) during sleep deprivation; (5) Variations in genes regulating sleep, circadian, and cognitive functions.

The prospective validation is currently being accomplished by the addition of the predictor markers to three separate studies on sleep deprivation that are currently underway. Across the three studies being leveraged, there will be a total of N=120 healthy adults (diverse in age, gender, ethnicity) on which predictive validation will be performed.

Data collection on the five biomarkers continued during the second year of funding. During the second year of funding, data on predictor marker 1 (see above) have been collected on a total of N=18 unique subjects who completed a TSD protocol and N=25 unique subjects who completed a PSD protocol. Projected data collection on biomarker 1 during the second year funding period is expected to be a total of N=22 unique TSD subjects and N=29 PSD subjects. Data on predictor markers, 2, 3, 4, and 5 (see above) have been collected on a total of N=23 unique subjects who completed a TSD protocol and N=31 unique subjects who completed a PSD protocol. Projected data collection on biomarkers 2, 3, 4, and 5 during the second year funding period is expected to be a total of N=27 unique TSD subjects and N=35 PSD subjects. Total data collection on predictor marker 1, which includes years 1 and 2, have yielded collected data on a total of N=42 unique TSD subjects and N=49 unique PSD subjects. Total data collected to date on predictor markers 2, 3, and 5 have yielded collected data on a total of N=49 unique TSD subjects and N=57 unique PSD subjects. Total data collection on predictor marker 4 have yielded data on a total of N=45 unique TSD subjects and N=57 unique PSD subjects. During the third year of funding, the historical database of Specific Aim 1 will be complete and statistical analyses to determine the core dimensions of responses to acute and partial sleep deprivation will be executed. Data collection on the five biomarkers of Specific Aim 2 will continue to be collected resulting in a projected total of N=34 unique TSD subjects and N=34 unique PSD subjects during the third year of funding. Additionally, data from N=24 unique subjects were collected in both TSD and PSD conditions.

The identification of biomarkers addresses multiple NASA BHP risk and gaps by identifying indicators of vulnerabilities and resiliencies to sleep loss (Sleep Gap 4), defining characteristics of individuals resilient to the neurobehavioral decrements from sleep loss (BMed5), and by identifying psychological measures that can be used to select individuals for long duration space flight (Team Gap 4). Finding valid markers of susceptibility to neurobehavioral deficits from total and chronic partial sleep loss will make it possible to optimize crew resources and fatigue management during long-duration space flight, and it will have substantial benefits for fatigue management in many Earth-based, safety-sensitive operations. The project deliverable will be a technique (technology) for discriminating those who are more resistant versus those more susceptible to the adverse effects of fatigue on neurobehavioral functions. The functions to be predicted include separate and common variance among outcomes in the domains of behavioral and physiological alertness, cognitive performance, subjective fatigue/sleepiness, and homeostatic sleep response.

## Rationale for HRP Directed Research:

Research Impact/Earth Benefits:

The research builds on an extensive body of work we have conducted to help manage the cognitive and neurobehavioral performance of astronauts in space while being exposed to chronic partial or total sleep deprivation. The acquisition of critical knowledge of objective markers of the large inter-individual differences in susceptibility to the neurobehavioral decrements from sleep-related fatigue help predict successful adaptation and performance in isolated, confined, and extreme environments. The identification of predictive biomarkers will have utility in a broad range of Earth-based applications in which sleep restriction, stress, and neurobehavioral stability have major adverse impacts on human performance (e.g., transportation modes, power plants, military operations).

This project is comprised of two different experiments: (1) the identification of core dimensions of neurobehavioral responses to sleep loss (Specific Aim 1) using a historical database of cognitive, subjective, and physiological responses to acute and chronic sleep loss in healthy adults (N=640); and (2) using the core dimensions of neurobehavioral responses to sleep loss to prospectively assess the validity of biomarkers of susceptibility to the neurobehavioral deficits from sleep loss. We are currently creating the historical database to achieve Specific Aim 1 by locating and formatting historical data from N=640 healthy adults. The historical database includes data from experiments manipulating sleep duration in healthy adults through both total sleep deprivation (TSD) and chronic partial sleep deprivation (PSD) protocols conducted over the past 25 years. Of the proposed total N=640 subjects, a subset of N=175 unique subjects participated in one of ten TSD experiments and a subset of N=465 unique subjects participated in one of nine PSD experiments. Data on ten primary outcomes collected across the 19 studies are being included in the statistical determination of the core dimensions of responses to sleep loss. In addition to the progress constructing the historical

Task Description:

Task Book Report Generated on: 04/26/2024

Task Progress:	database, data collection on predictor biomarkers (Specific Aim 2) has begun.  During the second year of funding, assessments of predictor markers were collected in three currently funded scientific experimental protocols, which expose participants to total and/or chronic partial sleep deprivation. The five predictor markers are: (1) Resting arterial spin labeling (ASL fMRI) cerebral blood flow without sleep deprivation; (2) Resting psychomotor vigilance test (PVT) time on task (TOT) without sleep deprivation; (3) Heart rate variability (HRV) during PVT TOT; (4) Salivary a-amylase activity (sAA) during sleep deprivation; (5) Variations in genes regulating sleep, circadian, and cognitive functions.
	Collected data includes neuroimaging of non sleep deprived subjects at baseline, Psychomotor Vigilance Task (PVT) performance, electrocardiograms during the 20-minute PVT, saliva samples during PSD, and blood draws during both TSD and PSD. During year 2, data on predictor marker 1 have been collected on a total of N=18 unique TSD subjects and N=25 unique PSD subjects. Projected data collection on biomarker 1 for year 2 is expected to total of N=22 unique TSD and N=29 PSD subjects. Data on predictor markers, 2, 3, 4, and 5 have been collected on a total of N=23 unique TSD subjects and N=31 unique PSD subjects. Projected data collection on biomarkers 2, 3, 4, and 5 during year 2 is expected to total of N=27 unique TSD and N=35 PSD subjects. Data collection on the five biomarkers of Specific Aim 2 will continue in year 3 with a projected total of N=34 unique TSD subjects and N=34 unique PSD subjects. Additionally, data from N=24 unique subjects were collected in both TSD and PSD conditions.
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