

AWARD NUMBER: W81XWH-14-1-0620

TITLE: Direct Test for Neuroinflammation with [11C]DAP-713-PET Scanning

PRINCIPAL INVESTIGATOR: Martin Pomper

CONTRACTING ORGANIZATION: Johns Hopkins University
Baltimore, MD 21218

REPORT DATE: October 2015

TYPE OF REPORT: Annual

PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

DISTRIBUTION STATEMENT: Approved for Public Release;
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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

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1. REPORT DATE October 2015			2. REPORT TYPE Annual		3. DATES COVERED 29 Sept 2014 - 28 Sept 2015	
4. TITLE AND SUBTITLE Direct Test for Neuroinflammation with [11C]DAP-713-PET Scanning					5a. CONTRACT NUMBER	
					5b. GRANT NUMBER W81XWH-14-1-0620	
					5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Pomper, Martin; Haley, Robert; Coughlin, Jennifer; Wang, Yuchuan					5d. PROJECT NUMBER	
					5e. TASK NUMBER	
					5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Johns Hopkins University 733 N. Broadway, MRB Ste. 117 Baltimore, MD 21205					8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Medical Research and Materiel Command Fort Detrick, Maryland 21702-5012					10. SPONSOR/MONITOR'S ACRONYM(S)	
					11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release; Distribution Unlimited						
13. SUPPLEMENTARY NOTES						
14. ABSTRACT This project concerns the non-invasive detection of inflammation in the brains of individuals suffering from the Gulf War Illness (GWI). We are using quantitative positron emission tomography (PET) using [11C]DPA-713 (DPA). DPA binds to the translocator protein (TSPO), which is located on the outer mitochondrial membrane and is an established biomarker of neuroinflammation. The study intends to enroll 10 patients and 10 appropriately matched healthy control subjects. The study is a collaboration between Johns Hopkins University and the University of Texas Southwestern Medical Center, where a carefully vetted population of individuals with GWI exists. PET imaging will be undertaken at Johns Hopkins.						
15. SUBJECT TERMS molecular imaging; PET; Gulf War Illness; DPA-713; distribution volume; neuroinflammation						
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Unclassified	18. NUMBER OF PAGES 14	19a. NAME OF RESPONSIBLE PERSON USAMRMC	
a. REPORT Unclassified	b. ABSTRACT Unclassified	c. THIS PAGE Unclassified			19b. TELEPHONE NUMBER (include area code)	

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1. **INTRODUCTION:** This project concerns the non-invasive detection of inflammation in the brains of individuals suffering from the Gulf War Illness (GWI). We are using quantitative positron emission tomography (PET) using [¹¹C]DPA-713 (DPA). DPA binds to the translocator protein (TSPO), which is located on the outer mitochondrial membrane and is an established biomarker of neuroinflammation. The study intends to enroll 10 patients and 10 appropriately matched healthy control subjects. The study is a collaboration between Johns Hopkins University and the University of Texas Southwestern Medical Center, where a carefully vetted population of individuals with GWI exists. PET imaging will be undertaken at Johns Hopkins.
2. **KEYWORDS:** molecular imaging; PET; Gulf War Illness; DPA-713; distribution volume; neuroinflammation
3. **ACCOMPLISHMENTS:**
 - **What were the major goals of the project?**
 - To identify, contact, and screen subjects for study.
 - To perform [¹¹C]DPA-713 PET to study neuroinflammation in GWI and controls.
 - **What was accomplished under these goals?**
4. Since our approval for recruitment on August 4, 2015 our recruitment is on target and we are actively screening potential participants. To date, we have enrolled one study participant, who tolerated the study procedures well and report no adverse events. Analysis of that scan and blood genotyping revealed that this initial subject had the T/T genotype, which is associated with < 10% of patients sampled. It is also associated with relative insensitivity to imaging with second-generation TSPO-targeted imaging agents, such as DPA. Recruitment is ongoing.
 - **What opportunities for training and professional development has the project provided?**
 - Although not necessarily intended for this purpose, the project will prove instrumental in the professional development of Dr. Il Minn, currently an instructor in radiology, who will be proposed soon for assistant professor. Furthermore, Dr. Minn has engaged two technicians whom he has trained in the cloning and other studies necessary to undertake the genotyping aspects of this work.
 - **How were the results disseminated to communities of interest?**
 - Nothing to report at the present time.
 - **What do you plan to do during the next reporting period to accomplish the goals?**
 - We intend to complete recruitment, imaging and analysis. Since we are quite familiar with the radiotracer being used, we anticipate that once recruitment is completed the remainder of the study will proceed smoothly.
5. **IMPACT:**
 - **What was the impact on the development of the principal discipline(s) of the project?**
 - This is the first project to study neuroinflammation in this patient cohort.
 - **What was the impact on other disciplines?**
 - Nothing to report at this time as we have not yet published.

- **What was the impact on technology transfer?**
 - Nothing to report at this time.
 - **What was the impact on society beyond science and technology?**
 - Nothing to report at this time.
6. **CHANGES/PROBLEMS:** Nothing to report
7. **PRODUCTS:** Nothing to report – These items will be reported once finished with the project and publications are submitted.
8. **PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS**
- **What individuals have worked on the project?**
 - No change
 - **Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?**
 - Martin Pomper

Ended

Title: PSMA-Based Cancer Imaging Agents

Time Commitments: 0.24 calendar months

Supporting Agency: NCI, R01CA134675 (NCE)

Grants Contact: Barbara Croft (301) 496-9531 E-Mail: croftb@mail.nih.gov

PI: Martin Pomper

Performance Period: 4/1/2009-2/28/2015

Level of Funding: \$159,199

Description of Goals: Prostate cancer (PCa) is the leading cancer in the U.S. population and the second leading cause of cancer death in men (16). Therapy for locally advanced disease remains contentious and an increasing number of disparate options are available. Perhaps the most pressing issue in PCa management is the need to predict, at the time of diagnosis, which tumors will remain indolent and which will progress rapidly. The ability to fulfill that goal would eliminate the prostate-specific antigen (PSA)-mediated over detection and overtreatment of clinically insignificant disease.

Aim #1: Synthesis and evaluation of a series of PET imaging agents for PSMA.

Aim #2: Synthetic optimization of the best compounds of Aim 1 en route to GMP and/or facilitated use.

Aim #3: Synthesis and evaluation of a series of homo- and heterodimeric imaging agents for PSMA.

Title: BETR Therapy of Herpesvirus-associated Tumors

Time Commitments: 1.09 calendar months

Supporting Agency: NCI, NIH R01CA138636

Grants Contact: Jason Gill (301) 496-7240 E-Mail: gilljas@mail.nih.gov

PI: Martin Pomper

Performance Period: 04/01/10-02/28/15

Level of Funding: \$322,099

Description of Goals: The purpose is to treat gammaherpesvirus-associated tumors with [¹³¹]FIAU in human subjects

Aim #1: To perform a first-in-man, FIAU-PET image-guided, BETR study in patients with EBV-associated malignancies.

Aim #2: To assess parameters that will aid in the optimization of therapy.

Title: TK-based Infection Imaging

Time Commitments: 0.24 calendar months

Supporting Agency: NIH, NIBIB R01EB009367 (NCE)

Grants Contact: Florence Turska (301) 496-9314 E-Mail:ft7p@nih.gov

PI: Martin Pomper

Performance Period: 05/15/10-04/30/15

Level of Funding: \$267,740

Description of Goals: The goal is to study further musculoskeletal infection, comparing a newly developed method in infection imaging to the current clinical standard of tagged white blood cell (WBC) and attempting to determine the sensitivity and specificity of our technique.

Aim #1: Estimate the sensitivity and specificity of FIAU-PET in detecting orthopedic infection.

Aim #2: To extend the FIAU imaging technique to pulmonary infection.

Aim #3: To transition from [124I]FIAU to [18F]FIAU for imaging bacterial infection.

Title: Precision Measurement in Rheumatoid Arthritis

Time commitments: 0.09 calendar months

Supporting Agency: Sibley Hospital 90048894 (NCE)

Grants Contact: Robert L. Sloan, President and CEO; 5255 Loughboro Rd, N.W., Washington DC 20016; 202-537-4680

PI: Rosen

Role: Co-Investigator

Performance Period: 11/1/2011-10/31/2014

Level of Funding: \$600,035

Description of Goals: The long term goal of this aim is to improve the utility of MR imaging in evaluation of RA

Aim 1: A graded approach, extending from basic studies to those with an obvious pathway to clinical translation by providing the following specific aims, which focus on molecular imaging.

Aim 2: A graded approach, extending from basic studies to those with an obvious pathway to clinical translation by providing the following specific aims, which focus on high-field magnetic resonance (MR) (Aim 2) imaging.

Title: Molecular Imaging for Macrophage-Associated Pulmonary Inflammation

Time commitments: 0.36 calendar months

Supporting Agency: NIH/NHLBI 1R01HL116316

Grants Contact: Kimberly Stanton, (301) 435-0519, E-Mail stantonk@nhlbi.nih.gov

PI: Sanjay Jain

Performance Period 9/25/2012- 6/30/2015

Level of Funding: \$238,000

Role: Co-Investigator

Description of Goals: The overall goal is to have a fully validated probe ready for human administration and to file a FDA Investigational New Drug (IND) application at the end of the funding period.

Aim 1: To evaluate [125/4I]DPA-713-SPECT/ PET as a biomarker for serial monitoring of macrophage-associated pulmonary inflammation.

Aim 2: To perform cGMP synthesis and toxicology studies for iodo-DPA-713.

Aim 3: To quantify and correlate lesion-specific, multi-modality image parameters across different time-points using in-house computer-assisted image analysis tools.

Title: Extrathalamic nAChR-PET for Imaging Neurodegeneration

Time Commitments: 0.46 calendar months

Supporting Agency: NIHR33AG037298

Grants Contact: Jessica Perez, 301-496-1472, E-Mail: perezj@nia.nih.gov

PI: Andrew Horti

Role: Co-Investigator

Performance Period: 03/1/2011-8/31/2015

Level of Funding: \$249,274

Description of Goals: The goal is to develop a new nicotinic receptor-based PET agent that enables imaging of extrathalamic sites.

Aim 1, R21. To develop a method of synthesis of sufficient quantities (100-300 mg) of precursor (-)JHU87571 for radiolabeling of [18F]XTRA for 100 radiosyntheses.

Aim 2, R21. To evaluate [18F]XTRA in mice. (a) To confirm that in vivo [18F]XTRA binds at nAChR selectively and specifically. (b) To show that the radioactive metabolites are not present in the mouse brain. (c) To carry out radiation dosimetry studies in mice for an eIND application.

Aim 3, R21. To characterize [18F]XTRA in baboon PET studies. (a) To confirm that the high nAChR binding potentials in cortex, hippocampus and putamen ($BP \geq 1.1$) and optimally rapid brain kinetics were not unique to the single experiment of the Preliminary studies.

Title: Multi-Color Exchange Transfer Imaging of Drug Delivery Nanocarriers

Time Commitments: 0.09 calendar months

Supporting Agency: NIH R01EB01531

Grants Contact: Guoying Liu, 301-594-5220, E-Mail: liug@mail.nih.gov

PI: Michael McMahon

Role: Co-Investigator

Performance Period: 8/1/2011-6/30/2015

Level of Funding: \$439,205

Description of Goals: This proposal is focused on the production of carriers for cervical tumor drugs which are labeled with DIACEST contrast agents for MRI monitoring.

Aim #1: To design a library of peptide-based DIACEST contrast agents suitable for incorporation into biodegradable particles

Aim #2: To design CEST drug carriers optimized for systemic nanoparticle-based chemotherapy

Aim #3: (A) To design CEST drug carriers optimized for local nanoparticle-based chemotherapy. (B) To test imaging after local and systemic administration.

New

Title: PSMA Directed Imaging of Prostate Cancer Focus on Androgen Receptor Dynamics

Time Commitments: 1.35

Supporting Agency: NIH/NCI U01CA183031

Grants Contacts: Yantian Zhang; Program Official; 240-276-5980; Yantian.zhang@nih.gov

PIs: Pomper/Deweese

Performance Period: 11/01/2014-10/31/2016

Level of Funding: \$496,642

Description of Goals: The overall goal is to validate at least two positron-emitting, PSMA-targeted imaging agents clinically so that they can be used to full advantage in supporting existing and emerging therapies for a spectrum of patients suffering from PCa.

Aim 1. To image treatment-naïve patients with localized-locally advanced primary PCa using DCFBC-PET/magnetic resonance imaging, and correlate signal with that on MR concurrently obtained, as well as with tumor grade, PSMA expression and androgen receptor (AR) signaling before and after two months of neoadjuvant androgen deprivation (ADT).

Aim 2. To image patients with CRPC using DCFBC-PET/MR and correlate findings with bone and soft tissue biopsy.

Aim 3. To image patients with CRPC with DCFBC-PET/MR and correlate with standard ^{99m}Tc-based bone scan to guide stereotactic body radiation treatment (SBRT) in patients with oligometastatic disease.

Aim 4. Imaging CRPC with the second-generation, PSMA-targeted PET agent, [18F]DCFPyL.

Title: High-Specificity Imaging Agents for Aggressive Prostate Cancer

Time commitments: 1.35 calendar months

Supporting Agency: NIH/NCI (Renewal) R01CA134675

Grants Contact: Leota Hall; Program Official; 240-276-6449; halle@gmail.nih.gov

PI: Pomper

Performance Period: 12/1/2014-11/30/2019

Level of Funding: \$443,885

Description of Goals: The goals of this project are to leverage existing but untested agents and to develop new agents for imaging PC, with a focus on aggressive, localized disease.

Aim 1: Imaging of patients with biopsy-proved primary PC with DCFPyL-PET with subsequent correlation of PET signal with histopathology at prostatectomy for PSMA expression, Gleason score and other markers

Aim 2: Synthesis of select PSMA-targeted imaging agents that (a) encompass a new scaffold to engender superior affinity and pharmacokinetics; (b) are hetero-bivalent (HtBv), homing to a rationally chosen co-target (in addition to PSMA); or, (3) enable detection with MR through signal amplification

Aim 3: Development and testing of new agents for imaging the PC microenvironment

Title: Direct Test for Neuroinflammation with [11C]DPA-713-PET Scanning

Time commitments: 1.20 calendar months

Supporting Agency: DoD W81XWH-14-1-0620

Grants Contact: Kathy Robinson, GWIRP Grants Officer; 820 Chandler St, Fort Detrick MD 21702

PI: Pomper

Period of Performance: 07/01/2014-06/30/2019

Level of Funding: \$389,978

Description of Goals: This project concerns measuring two key neurological aspects of Gulf War Illness (GWI), namely, neuroinflammation and dysregulation of muscarinic cholinergic transmission.

Aim 1. To assess the degree of microglial activation in the brains of former Gulf War veterans who suffer from GWI through [11C]DPA-713 PET.

Title: Bipolar Androgen Therapy: Breaking out of the Chrysalis of Chronic Androgen Deprivation Therapy in Men with Late-Stage Castrate Resistant Prostate Cancer

Time commitments: 0.12 calendar months

Supporting Agency: CDMRP

Grants Contact: TBD

PI: Denmeade

Co-Investigator: Pomper

Performance Period: 09/1/2014-08/31/2017

Level of Funding: \$1,669,328

Aim 1: The major objective is to demonstrate the superiority of BAT vs. Enza in asymptomatic men with metastatic CRPC progressing after ADT and Abi, by performing a multi-institutional, open-label, randomized study, using radiographic progression-free survival (rPFS) as the primary endpoint.

Aim 2: Evaluate the effect of BAT on the uptake of FDHT and PSMA inhibitor-based PET agents in metastatic sites.

Aim 3: Evaluate regulation of AR splice variants in circulating tumor cells (CTCs) in response to therapy.

Aim 4. Analyze circulating tumor DNA to determine the effect of individual therapies on emergence of AR mutations.

- Robert W. Haley

Ended

Title: UT Southwestern Clinical and Translational Alliance for Research (UT-STAR)

Grant Number / PI: TR000451-06 / Toto, Robert D.

Time commitment / Role: 0.60 calendar months / Co-Investigator

Supporting agency: NIH/NCRR

Contacts: Tiffany Walker, (301) 435-0839, Email: walkerti@mail.nih.gov

Performance period: 06/01/12 – 05/31/13

Level of funding: \$4,618,151

Description of Goals: The major goal of this grant is to provide the crucial infrastructure necessary for medical scientists to discover and apply new diagnostics and therapeutics for the detection, diagnosis, treatment and prevention of disease, and thereby achieve the goal of improving our nation's health in a safe, ethical and responsible manner that ensures the individual's well-being and the public's trust.

Aim 1: Transform the BERD KF to a single point of access for biostatistics, clinical research ethics, and research design to meet the increasingly complex demands of clinical and

translational research, to collaborate on the development of all study protocols, and to provide necessary biostatistical, epidemiologic, and ethics support during the conduct of the studies

Aim 2: Educate and train investigators in biostatistics, clinical research ethics, and research design by adapting and expanding current curriculum for clinical and translational research.

Aim 3: Grow novel research collaborations out of consultation and educational services and develop innovative statistical methods, designs, and research ethics policies/procedures to facilitate and expand clinical and translational research in the UT-STAR community and beyond.

Aim 4: Integrate the BERD KF with other KFs and collaborate with Texas Regional and National BERD consortiums.

Title: Integrating Multimodal Brain Imaging Data to Assess Subtle Cognitive Impairment

Grant Number / PI: 1-R21-EB014563-01 / Spence, Jeffrey

Time commitment / Role: 0.36 calendar months / Co-Investigator

Supporting agency: NIBIB

Contact: Angelos Bacas, (301) 451-4785, Email: ab329b@nih.gov

Performance period: 04/01/2012 – 03/31/2014 (no cost extension pending)

Level of funding: \$135,708

Description of Goals: The primary goal of this research is to develop a novel analytic framework, based on spatial modeling, to improve the ability to measure subtle changes in brain states that can occur in the pathology of cognitive impairment due to degenerative diseases, traumatic brain injury, adjuvant chemotherapy and other exposure-related illnesses. Achieving this goal may suggest treatments to alleviate symptoms, prevent progression, or at minimum, provide an informed clinical management strategy

Aim 1: Extending spatial modeling methodology to BOLD fMRI and EEG power spectra

Aim 2: Deriving a kriging-based ICA approach for defining functional brain networks

Aim 3: Integrating imaging modalities by the construction of statistical classifiers based on derived sets of features defined in the first two aims.

Title: Abnormalities in Human Brain Creatine Metabolism in Gulf War Illness Probed with MRS

Grant Number / PI: GW110034 / Briggs, Richard

Time Commitment / Role: 0.6 calendar months / Co-Investigator

Supporting Agency: US Department of Defense

Grants Officer: Kathy E. Robinson, 301-619-4018, Email: kathy.robinson@us.army.mil

Performance Period: 09/30/2012 – 09/29/2014

Level of Funding: \$259,619 (year 1 D.C.)

Description of Goals: The primary goal of this research is to investigate creatine metabolism in brains of Gulf War Illness veterans by estimating amounts of phosphocreatine (PCr) and free creatine (Cr) using ³¹P and ¹H magnetic resonance spectroscopy (MRS). Secondary goals are to measure individual ¹H T₂ relaxation times of the methyl resonances of PCr and Cr and to measure amounts of adenosine triphosphate (ATP) and inorganic phosphate (Pi) as well as to estimate intracellular pH and magnesium ion (Mg²⁺) concentrations from ³¹P MRS data.

Aim 1: To acquire and analyze localized 1H MRS data of right basal ganglia with multiple TE values sufficient to individually estimate the intensities and T2 values of the methyl resonances of PCr and Cr in four groups of Gulf War veterans (healthy controls and Haley Syndromes 1, 2, and 3).

Aim 2: To acquire and analyze localized 31P MRS data of basal ganglia and white matter (centrum semiovale) in four groups of Gulf War veterans (healthy controls and Haley Syndromes 1, 2, and 3) for estimation of amounts of PCr, adenosine triphosphate (ATP), and inorganic phosphate (Pi).

Title: Genomewide Association Study of a Validated Case Definition of Gulf War Illness in a Population-Representative Sample

Grant Number / PI: GW100073 / Robert W. Haley, MD

Time Commitment / Role: 1.2 calendar mo./ Principal Investigator

Supporting Agency: DoD/CDMRP/GWIRP

Grants Officer: Jennifer Shankle, 301-619-2193, E-mail: jennifer.shankle@amedd.army.mil

Performance Period: 1 Sept 2011 – 30 Aug 2013

Level of Funding: \$140,357

Description of Goals: The objective is to measure genome-wide RNA gene expression with next generation RNA sequencing (RNA-seq) on approximately 150 ill Gulf War veterans selected from a national survey in a random sample of Gulf War veterans, meeting a validated case definition of Gulf War illness and controls, and thoroughly phenotyped with extensive brain imaging, EEG, and clinical studies. The goal is to identify patterns of gene expression that clearly differentiate the three variants of Gulf War illness and controls that can be used to define an objective diagnostic test and new clues to pathogenesis and treatment.

Aim 1: Perform gene expression profiling and group comparison analyses of differential gene expression in RNA-stabilized blood samples of the approximately 150 veterans meeting the Factor case definition and Gulf War-era veteran controls.

Title: Gulf War Veterans' Illness Research Program

Grant Number / PI: IDIQ Contract VA549-P-0027 / Robert W. Haley, MD

Time Commitment / Role: 70% / Program Director

Supporting Agency: Department of Veterans Affairs

Grants Officer: Vanessa Morton

Performance Period: 14 Nov 2006 – 1 June 2010

Level of Funding: \$33.5 million

Description of Goals: The fundamental goal of Gulf War Veterans' Illnesses research is to ultimately improve the health of ill Gulf War Veterans. To this end, UTSWMC shall conduct and manage research projects supported by task orders awarded against this contract. The research will answer central questions on the nature, causes and treatments of Gulf War Veterans' Illnesses.

Aim 1: Perform a national survey of Gulf War-era veterans to estimate the prevalence of Gulf War illness (GWI) in deployed and nondeployed populations and provide a representative sample for further studies

Aim 2: Develop high throughput methods for measuring paraoxonase-1 isoenzymes and perform studies on its role in the pathogenesis of GWI

Aim 3: Perform multiple neuroimaging, EEG and neuropsychological testing protocols on a representative sample of Gulf War-era veterans; and 4) Perform pre-clinical experimental studies on the mechanisms by which cholinesterase-inhibiting chemicals cause chronic brain dysfunction.

New

Title: Evaluating Re-active Surveillance Strategies for Malaria Elimination

Time Commitment / Role: 0% / Mentor (Michelle Hsiang, PI)

Grant Number: 7 K23 AI101012-04

Supporting Agency: NIH

Grants Officer: Malla Rao, DRPH, malla.rao@nih.gov

Period of Performance: 6/1/2015 – 5/31/2016

Level of Funding: \$243,500

Description of Goals: utilize a cluster randomized controlled study design to compare the effectiveness to interrupt malaria transmission of Targeted Parasite Elimination and Reactive Case Detection in reaction to a passive identified index case.

Aim 1: Primary Aim. To compare the impact of TPE versus RACD on cumulative incidence of malaria cases.

Aim 2: To compare the impact of TPE versus RACD on malaria seroprevalence, malaria infection prevalence, ratio of imported to local malaria infections, and time to first incident local case after intervention.

Title: Direct Test for Neuroinflammation with [11C]DPA-713-PET Scanning

Time Commitment / Role: 1.20 calendar months / Co-Investigator

Grant Number: GW130098 / Pomper, Martin

Supporting Agency: Department of Defense

Grants Officer: Kathy Robinson

Period of Performance: 07/01/2014-06/30/2019 (funding recommended and in negotiation)

Level of Funding: \$389,978

Description of Goals: This project concerns measuring two key neurological aspects of Gulf War Illness (GWI), namely, neuroinflammation and dysregulation of muscarinic cholinergic transmission.

Aim 1: To assess the degree of microglial activation in the brains of former Gulf War veterans who suffer from GWI through [11C]DPA-713 PET.

- Jennifer Coughlin

New

Title: Characterizing Altered Levels of Cerebrospinal Fluid (CSF) and Serum Markers in Recent Onset Schizophrenia

Time Commitment: 1.86 Calendar

Supporting Agency: Brain and Behavior Research

Grants Officer: Sho Tin Chen

Performance Period: 01/15/2014-01/14/2016

Level of Funding: \$30,000

Description of Goals: The goal is to identify central and peripheral biomarkers present early in the course of schizophrenia.

Aim 1. Characterization of differences in the concentration of “oxidative stress” neurochemical mediators between CSF and serum specimens of drug-naïve patients with recent-onset SZ (defined as within one year of onset of symptoms, n=82) and those of age- and gender-matched HCs (n=82).

Aim 2. Validation of oxidative stress/neuroinflammation in recent-onset SZ by PET- and MRS-based imaging.

Title: Personalized Molecular Neuroimaging of Inflammation in Recently Retired NFL Players

Time Commitment: .96 Calendar

Supporting Agency: General Electric Corp; GE/NF

Grants Officer: unknown

Performance Period: 07/22/2014-01/21/2016

Level of Funding: \$300,000

Description of Goals: Measure the degree of microglial activation in recently former NFL players

Aim 1. Measurement of the degree of microglial activation in recently former NFL players with DPA-PET.

Aim 2. Measurement of 5HTT activity in the same subjects as in Aim 1 using DASB-PET.

Title: Extrathalamic nAChR-PET for Imaging Neurodegeneration

Time Commitment: 1.8 Calendar

Supporting Agency: NIH

Grants Officer: unknown

Performance Period: 09/15/2012-05/31/2016

Level of Funding: \$249,274 (NCE)

Description of Goals: The goal is to develop a new nicotinic receptor-based PET agent that enables imaging of extrathalamic sites

Aim 1, R21. To develop a method of synthesis of sufficient quantities (100-300 mg) of precursor (-)JHU87571 for radiolabeling of [18F]XTRA for 100 radiosyntheses.

Aim 2, R21. To evaluate [18F]XTRA in mice. (a) To confirm that in vivo [18F]XTRA binds at nAChR selectively and specifically. (b) To show that the radioactive metabolites are not present in the mouse brain. (c) To carry out radiation dosimetry studies in mice for an eIND application.

Aim 3, R21. To characterize [18F]XTRA in baboon PET studies. (a) To confirm that the high nAChR binding potentials in cortex, hippocampus and putamen ($BP \geq 1.1$) and optimally rapid brain kinetics were not unique to the single experiment of the Preliminary studies.

Title: Biomarker and Drug Target Discovery for Subjects with First Episode Psychosis

Time Commitment: 2.4 Calendar

Supporting Agency: Mitsubishi Tanabe Pharma Corporation

Grants Officer: Kaji Takahide

Performance Period: 09/30/2012-09/29/2017

Level of Funding: \$1,793,839

Description of Goals: The goal of this study is to identify biomarkers of first episode psychosis, which are specifically associated with novel drug discovery.

Aim 1: to identify biomarkers of first episode psychosis

Title: Direct Test for Neuroinflammation with [11C]DPA-713-PET Scanning

Time Commitment: 2.4 Calendar

Supporting Agency: Department of Defense

Grants Officer: Unknown

Performance Period: 09/29/2014-09/28/2017

Level of Funding: \$347,212

Description of Goals: To assess the degree of microglial activation in the brains of former Gulf War veterans who suffer from GWI

Aim 1. To assess the degree of microglial activation in the brains of former Gulf War veterans who suffer from GWI through [11C]DPA-713 PET.

- Yuchuan Wang

New

Title: PSMA Directed Imaging of Prostate Cancer Focus on Androgen Receptor Dynamics

Time Commitments: 1.8 Calendar Months

Supporting Agency: NCI

Grants Contact: unknown

PI: Pomper

Performance Period: 07/14/2015 – 06/30/2018

Level of Funding: \$255,280

Description of Goals: The overall goal is to validate at least two positron-emitting, PSMA-targeted imaging agents clinically so that they can be used to full advantage in supporting existing and emerging therapies for a spectrum of patients suffering from PCa.

Title: Direct Test for Neuroinflammation with [11C]DPA-713-PET Scanning

Time Commitments: 2.4 Calendar Months

Supporting Agency/Award Number: DoD W81XWH-13-GWIRP-IIR - GW130098

Grants Contact: unknown

PI: Pomper

Performance Period: 09/29/2014 - 09/28/2017

Level of Funding: \$214,328

Description of Goals: This project concerns measuring two key neurological aspects of Gulf War Illness (GWI), namely, neuroinflammation and dysregulation of muscarinic cholinergic transmission.

- **What other organizations were involved as partners?**
 - Nothing to report