Award Number:  W81XWH-12-2-0033

TITLE:  Army Medical Research & Materiel Command Resident Research Associateship Program

PRINCIPAL INVESTIGATOR:   Howard Gamble

CONTRACTING ORGANIZATION:  National Academy of Sciences/NAE/IOM
Washington, DC  20001

REPORT DATE: May 2017

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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The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision unless so designated by other documentation.
During this reporting period, the NRC promoted research opportunities at AMRMC institutes through a broad outreach plan. A total of 12 applications were received during the period and of these, 10 were reviewed by NRC panels. 8 awards were offered and all 8 were accepted. A total of 13 Associates ended their tenure during the reporting period and of these 9 submitted a final report. The productivity of these Associates is listed in the technical report.
The National Academies of
SCIENCES • ENGINEERING • MEDICINE
RESEARCH ASSOCIATESHIP PROGRAM
with
Walter Reed Army Institute for Research
U.S. Army Medical Research & Materiel Command
and Naval Medical Research Center/Naval Health Research Center

Annual Contract Technical Report
Contract No. W81XWH-12-2-0033
Contract Period: 05/01/2012-02/28/2018
Report Period: 05/01/2016-04/30/2017
During the reporting period, the National Academies of Sciences, Engineering, and Medicine (the Academies) NRC conducted the following activities in support of the subject contract:

**Outreach and Promotion**

The promotional schedule to advertise the NRC Research Associateship Programs included the following: 1) attendance at meetings of major scientific and engineering professional societies; 2) advertising in programs and career centers for these and other professional society meetings; 3) direct mailing and emailing of announcements and program materials to presidents, graduate deans, and heads of appropriate science and engineering departments and minority-affairs offices of all academic degree-granting institutions in the United States; 4) posting announcements on internet job sites, electronic newsletters and professional society websites; 5) print advertising in high profile publications (e.g., Science magazine, the Chronicle of Higher Education); and, 6) maintaining a presence on social media sites such as Facebook.

The Academies attended a number of minority focused events in which we maintained exhibit booths, participated in workshops and advertised in meeting literature, newsletters and websites or submitted materials for distribution. In addition, ads were placed in a variety of minority publications (e.g., Affirmative Action, Black Collegian).

In advertising the Research Opportunities available to prospective applicants, the Academies maintained an up-to-date listing of all active Research Advisers, current Adviser contact information and details of each Research Opportunity.

**Processing and Review of Applications**

Applications to the Research Associateship Programs were submitted via a web-based application system. Each application cycle opened two months prior to the application deadline. Academies staff provided support to prospective applicants including providing application instructions, technical support and additional information as requested.

A summary of applications for the reporting period is shown in Table 1.

For each applicant, the Academies received and processed an application form, a research proposal, transcripts, a statement of previous and current research, and confidential reference reports. An application file check was made prior to the review and each applicant was notified if required documents were missing.

The Academies convened panels in five broad discipline areas for the competitive review of applications in the NRC Research Associateship Programs. Results of the review were made available to Laboratory Program Representatives immediately following the conclusion of the each review.

A summary of the outcome of the review of applications for the reporting period is shown in Table 1.

**Administration of Awards**

The Academies made awards to applicants based on sponsor authorization. A summary of awards authorized and the acceptance or declination by the applicant during the current reporting period is shown in Table 1.

For NRC Research Associates beginning or continuing tenure, the Academies provided the administrative functions described in the contract Statement of Work. These functions included stipend payments,
management of a major medical benefits insurance program, and reimbursement for relocation and travel to professional meetings.

A summary of NRC Research Associates on tenure during the reporting period is shown in Table 2.

**Outcomes Reporting**

All NRC Research Associates who completed tenure were required to submit a final report that described the outcome of their Research Associateship award. Final reports received by the Academies during the current reporting period are attached to this technical report.

The activities of NRC Research Associates submitting final reports during this reporting period, including publications, presentations and patents, as well as an assessment of their experience in the program, are summarized in Table 3. Specific accomplishments of NRC Research Associates completing tenure during the reporting period are summarized in individual Final Reports (attached).

**Table 1.** Summary of applications and awards

**Table 2.** NRC Research Associates on tenure during the reporting period

**Table 3.** Activities of NRC Research Associates who completed tenure during the reporting period

**Attachments:** NRC Research Associates Final Reports, including Research Accomplishments and Scholarly Productivity
### Table 1: Summary of applications and awards

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**Table 2: NRC Research Associates on tenure during the reporting period**

<table>
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<tr>
<th>Associate</th>
<th>Adviser</th>
<th>Tenure Dates</th>
<th>Country of Citizenship</th>
<th>Final Report</th>
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<tr>
<td>No associates on tenure during report period.</td>
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</table>
Table 3: Activities of NRC Research Associates who completed tenure during the reporting period

0 Associates ended tenure during the report period
0 months was the average tenure length
0 months was the longest
0 months was the shortest
0 submitted final reports

In the final reports, Associates indicated the following scholarly activity while on tenure.

0 Articles published in refereed journals
0 Articles other (Proceedings, Book Chapters, other)
0 Domestic presentations
0 International presentations
0 Patent applications
0 Awards

After ending their tenure, Associates indicated their future plans as follows:

0 Permanent position at the NRC host agency
0 Contract or temporary position at the NRC host agency
0 Research/administrative position with another U.S. government agency
0 Research/administrative position with foreign government agency
0 Research/teaching at US college/university
0 Research/teaching position at a foreign college or university
0 Research/administrative position in private industry in the U.S.
0 Research/administrative position in private industry outside of the U.S.
0 Research/administrative position with a non-profit
0 Self-employed/consulting
0 Postdoctoral Research
0 Other
0 No information provided

In their final reports, Associates were asked to evaluate certain aspects of their experiences on a scale of 1 (low) to 10 (high). The average rating for each item follows:

0.0 Short-term value (lab)-Development of knowledge, skills, and research productivity at lab
0.0 Long-term value (career)-How your Research Associateship affected your career to date
0.0 Laboratory Support-Equipment, funding, orientation, safety & health training, etc.
0.0 Adviser Mentoring-Quality of mentoring from the Research Adviser
0.0 LPR Support-Quality of administrative support from the LPR
0.0 NRC Support-Quality of administrative support from the NRC
Attachments
Associates Final Reports, including Research Accomplishments and Scholarly Productivity, follow.
**Table 1: Summary of applications and awards**

<table>
<thead>
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Table 3: Activities of NRC Research Associates who completed tenure during the reporting period

13 Associates ended tenure during the report period
35 months was the average tenure length
66 months was the longest
8 months was the shortest
12 submitted final reports

In the final reports, Associates indicated the following scholarly activity while on tenure.

- 62 Articles published in refereed journals
- 16 Articles other (Proceedings, Book Chapters, other)
- 41 Domestic presentations
- 15 International presentations
- 0 Patent applications
- 9 Awards

After ending their tenure, Associates indicated their future plans as follows:

- 0 Permanent position at the NRC host agency
- 8 Contract or temporary position at the NRC host agency
- 1 Research/administrative position with another U.S. government agency
- 0 Research/administrative position with foreign government agency
- 0 Research/teaching at US college/university
- 0 Research/teaching position at a foreign college or university
- 0 Research/administrative position in private industry in the U.S.
- 0 Research/administrative position in private industry outside of the U.S.
- 1 Research/administrative position with a non-profit
- 0 Self-employed/consulting
- 0 Postdoctoral Research
- 1 Other
- 1 No information provided

In their final reports, Associates were asked to evaluate certain aspects of their experiences on a scale of 1 (low) to 10 (high). The average rating for each item follows:

- 9.8 Short-term value (lab)-Development of knowledge, skills, and research productivity at lab
- 9.7 Long-term value (career)-How your Research Associateship affected your career to date
- 9.7 Laboratory Support-Equipment, funding, orientation, safety & health training, etc.
- 9.4 Adviser Mentoring-Quality of mentoring from the Research Adviser
- 9.5 LPR Support-Quality of administrative support from the LPR
- 9.9 NRC Support-Quality of administrative support from the NRC
**Attachments**

Associates Final Reports, including Research Accomplishments and Scholarly Productivity, follow.
NRC RESEARCH ASSOCIATESHIP PROGRAM ASSOCIATE FINAL REPORT

Associate: Brager, Allison J
Program: AMRMC - U.S. Army Medical Research & Materiel Command
          Walter Reed Army Institute of Research
          Psychiatry & Neurosciences-Behavioral Biology Branch
          Silver Spring, MD 20910
Opportunity: B4509/Strategies for Maintaining Neurobehavioral Effectiveness during Chronic Sleep Restriction and Total Sleep Deprivation
Adviser: Capaldi, Vincent F
Research Proposal: ADORA2A SNP-mediated Differences in Ability to Sustain Arithmetic Performance During Sleep Loss
Tenure Dates: 07/18/2016-03/13/2017

RESEARCH ACCOMPLISHMENTS
1. I submitted four papers related to sleep and performance/sleep resiliency and genetics (2 published; 2 under review): Journal of Strength & Conditioning Research (published), Biochimie (published), eLife (under review), and Wilderness & Environmental Medicine (under review).
2. I served as co-PI for a study looking at genetic markers related to sleep resiliency and performance and performance maintenance with caffeine administration. This study is near the final stages of analysis.
3. I served as an AI for a study looking at changes in inflammatory markers with sleep manipulation. We submitted several abstracts related to that.
4. I have done preparatory work as AI of a study looking at sleep, mental health, and sports performance study.
5. I served as an AI for a study looking at sleep and neurobehavioral performance conducted on different platforms.

SCHOLARLY PRODUCTIVITY

ARTICLES - PEER REVIEWED

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<th>Author(s)</th>
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<td>Brager, Allison; Mistovich, Justin, 2017</td>
<td>Game Times and Higher Winning Percentages of West Coast Teams of the National Football League Correspond With Reduced Prevalence of Regular Season Injury</td>
<td>Journal of Strength &amp; Conditioning, 31(2):462-467</td>
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<tr>
<td>Brager AJ; Heemstra L; Bhambra R; Ehlen JC; Esser KA; Paul KN; Novak CM</td>
<td>Homeostatic effects of exercise and sleep on metabolic processes in mice with an overexpressed skeletal muscle clock</td>
<td>Biochimie; 132:161-165</td>
</tr>
<tr>
<td>Brager, AJ; Hammer SB; Capaldi V; Campbell B, 2017, In search of adaptive homeostasis in ultra-marathon runners</td>
<td>submitted to Wilderness &amp; Environmental Medicine</td>
<td></td>
</tr>
<tr>
<td>Ehlen JC*; Brager A*; Gray C; Baggs J; DeBruyne J; Esser KA; Takahashi J; Paul KN, 2017</td>
<td>Bmal1 function in skeletal muscle regulates sleep</td>
<td>eLife Sciences</td>
</tr>
</tbody>
</table>

ARTICLES - OTHER (PROCEEDINGS, BOOK CHAPTERS, OTHER)

PRESENTATIONS - DOMESTIC

PRESENTATIONS - INTERNATIONAL

PATENTS

AWARDS

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/03/2017</td>
<td>Chair, Public Advocacy Committee, Society for Research of Biological Rhythms</td>
</tr>
<tr>
<td>01/15/2017</td>
<td>National Collegiate Athletic Association (NCAA) Sleep Task Force, Sleep Research Society</td>
</tr>
</tbody>
</table>
NRC RESEARCH ASSOCIATESHIP PROGRAM ASSOCIATE FINAL REPORT

 Associate: DeDominicis, Kristen Elizabeth
 Program: AMRMC - U.S. Army Medical Research & Materiel Command
 Walter Reed Army Institute of Research
 Psychiatry & Neurosciences-Brain Trauma Neuroprotection and Neurorestoration
 Silver Spring, MD 20910
 Opportunity: B8288/Mechanisms and Biomarkers of Neurotrauma at the Walter Reed Army Institute for Research
 Adviser: Boutte, Angela M
 Research Proposal: Evaluating MicroRNAs as Prognostic Indicators of Chronic Deficits Following Mild Traumatic Brain Injury in Rats
 Tenure Dates: 09/08/2015-03/31/2017

RESEARCH ACCOMPLISHMENTS

Project 1: Single or repeat projectile concussive impact (sPCI or rPCI) injuries, or sham control manipulations, were induced in adult male Sprague-Dawley rats. The PCI model results in concussion symptomology in the absence of overt gross pathology or skull fracture. Assessments for loss of consciousness, gait, and cognitive and affective behaviors were performed. Fludeoxyglucose (FDG) Positron Emission Tomography (PET) experiments were conducted at 24h, 3 day(d), 7d, 1m, 3m, and 6m to assess alterations in glucose uptake.

Significant Findings:
Acute behavioral effects of PCI included greater righting reflex times, indicative of increased loss of consciousness, and gait dysfunction evident at 2h detected by the Catwalk gait analysis system across a wide number of parameters. Gait deficits were equally distributed across all limbs and, as hypothesized, more severe after rPCI than sPCI. The Morris water maze and elevated plus maze tasks did not reveal significant alterations in cognition or anxiety-like behavior, respectively, at 1m, 3m, or 6m after injury.

FDG-PET revealed significant alterations in FDG uptake in multiple brain regions following PCI. Overall, these results suggest that acute hypermetabolism resolves by 24h but is followed by chronic hypometabolism. Noteworthy alterations include elevated uptake in the olfactory bulb at 24h following both sPCI and rPCI and depressed uptake in the thalamus, which is present at 3d, resolves, then re-emerges chronically.

Project 2: Adult male Sprague-Dawley rats were injured by penetrating ballistic-like brain injury (PBBI), which mimics a gunshot wound to the head, or a less severe probe injury. Sham injured rats were included as a control. Abundance of the TBI hallmark proteins GFAP, alpha-II-spectrin, and their break-down products (BDPs) were assessed at 24h, 3d, 7d, 1m, and 3m after injury by Western blot and/or ELISA in discrete brain regions of interest and cerebrospinal fluid (CSF).

Significant Findings:
PBBI induced widespread tissue pathology in all markers assessed. This pathology was more robust and prolonged in areas encompassing the injury trajectory as opposed distal regions. Elevations in both full length GFAP and GFAP-BDPs were evident throughout 24h - 3m. Mild decreases in full length spectrin were seen throughout 3m while robust increases in calpain mediated spectrin BDPs were limited to 7d after injury. Probe injury alone resulted in less robust alterations than PBBI which were limited to areas of the injury trajectory only.

In CSF, GFAP and its BDPs were detectable after PBBI through 3d. Spectrin BDPs at 145/150 kDa were significantly elevated from 24h – 1m after PBBI. Significant correlations were obtained between CSF and brain tissues levels, suggesting the utility of these CSF proteins to predict underlying pathology. These results suggest that spectrin BDPs, rather than GFAP or its BDPs, may have greater utility as an acute – chronic biomarker after penetrating TBI.

SCHOLARLY PRODUCTIVITY

ARTICLES - PEER REVIEWED

ARTICLES - OTHER (PROCEEDINGS, BOOK CHAPTERS, OTHER)

PRESENTATIONS - DOMESTIC

DeDominicis, Kristen; Mountney, Andrea; Wilson, Colin; Jones, Scott; Jaiswal, Shalini; Bryant, Ying; Braverman, Stephanie; Hwang, Hye Mee; Hahn, Justin; Hoy, Andrew; Dardzinski, Bernard; Shear, Deborah; Selwyn, Reed; Cartagena, Casandra, 08/16/2016, Longitudinal FDG uptake changes following mild concussive brain injuries and correlation to clinical mTBI assessors in rats, 2016 Military Health Services Research Symposium, Orlando/Kissimmee, FL/USA

DeDominicis, Kristen; Hwang, Hye; Deng-Bryant, Ying; Shear, Deborah; Boutte, Angela; Cartagena, Casandra, 08/16/2016,
Regional acute and subacute alterations in GFAP, spectrin, and breakdown products following penetrating ballistic-like TBI in rats, 2016 Military Health Services Research Symposium, Orlando/Kissimmee, FL/USA

DeDominicis, Kristen; Hwang, Hye; Deng-Bryant, Ying; Shear, Deborah; Boutte, Angela; Cartagena, Casandra, 08/16/2016, Longitudinal changes in BAX and Bcl-2 in key regions of interest following penetrating traumatic brain injury in rats, 2016 Military Health Services Research Symposium, Orlando/Kissimmee, FL/USA

DeDominicis, Kristen; Hwang, Hye; Deng-Bryant, Ying; Shear, Deborah; Boutte, Angela; Cartagena, Casandra, 06/27/2016, Regional acute and subacute alterations in GFAP, spectrin, and breakdown products following penetrating ballistic-like TBI in rats., 2016 National Neurotrauma Symposium, Lexington, KY/USA

DeDominicis, Kristen; Hwang, Hye; Deng-Bryant, Ying; Shear, Deborah; Boutte, Angela; Cartagena, Casandra, 06/27/2016, Longitudinal changes in BAX and Bcl-2 in key regions of interest following penetrating traumatic brain injury in rats, 2016 National Neurotrauma Symposium, Lexington, KY/USA

DeDominicis, Kristen; Mountney, Andrea; Wilson, Colin; Jones, Scott; Jaiswal, Shalini; Bryant, Ying; Braverman, Stephanie; Hwang, Hye Mee; Hahn, Justin; Hoy, Andrew; Dardzinski, Bernard; Shear, Deborah; Selwyn, Reed; Cartagena, Casandra, 06/27/2016, Longitudinal FDG uptake changes following mild concussive brain injuries and correlation to clinical mTBI assessors in rats., 2016 National Neurotrauma Symposium, Lexington, KY/USA

PRESENTATIONS - INTERNATIONAL

PATENTS

AWARDS
**Research Accompishments**

- Demonstrated that ivermectin inhibits development of *Plasmodium falciparum* in the primary malaria vector, *Anopheles gambiae*
- Demonstrated that ivermectin is lethal to important Southeast Asian and Latin American malaria vectors
- Demonstrated that ivermectin inhibits the development of *Plasmodium vivax* in Southeast Asian malaria vectors, *Anopheles dirus*
- Demonstrated that ivermectin inhibits development of *Plasmodium falciparum* in the primary malaria vector, *Anopheles gambiae*
- Demonstrated that ivermectin is lethal to important Southeast Asian and Latin American malaria vectors
- Established the Ivermectin for Malaria Elimination Network, participated in multiple presentations and meetings of ivermectin effects indicate that there is an active mosquito-lethal metabolite of ivermectin

**Scholarly Productivity**

**Articles - Peer Reviewed**

- Kobylinski, Kevin; Ubalee, Ratawan; Ponlawat, Alongkot; Phasomkusolsil, Siripom; Tarning, Joel; Wattanakul, Thanaporn; Na-Bangchang, Kesara; McCardle, Wes; Szumlas, Daniel; Davidson, Silas; Richardson, Jason, 2017, Ivermectin susceptibility and sporontocidal effect in Greater Mekong Subregion *Anopheles*, Malaria Journal, pending
- Kobylinski, Kevin; Vasquez, Gissella; Baldeviano, Christian; Lopez, Victor; Escobedo, Karin; Stoops, Craig, 2017, Ivermectin susceptibility of the Amazonian malaria vector, *Anopheles darlingi*. Malaria Journal, pending
- Slater, Hannah; Kobylinski, Kevin; Aguas, Ricardo; White, Lisa; Azra, Ghani, 2017, Modelling the impact of ivermectin mass drug administration on *Plasmodium* transmission in the Greater mekong Subregion. Malaria Journal. pending
- Kobylinski, Kevin; Davidson, Silas; Jittamala, Podjanee; Pukrittayakamee, Sasithon; Hanboonkunupakarn, Borimas; van der Pluijm, Rob; Tarning, Joel; Dondorp, Arjen; Day, Nicholas; White, Nicholas, 2017, Safety, tolerability, pharmacokinetic interaction, and mosquito-lethal efficacy of ivermectin, dihydroartemisinin-piperaquine, and primaquine., Clinical Infectious Diseases, pending
- Sampaio, Vanderson; Beltrán, Tatiana; Kobylinski, Kevin; Lim, José; da Silva, Sara; Rodrigues, Iria; Silva, Henrique; Guerra, Maria; Pimenta, Paulo; Lacerda, Marcus; Monteiro, Wuelton, 2016, Filling gaps on ivermectin knowledge: effects on the survival and reproduction of *Anopheles aquasalis*, a Latin American malaria vector, Malaria Journal, 15, e491
- Rowland, Tobin; Davison, Silas; Kobylinski, Kevin; Menses, Claudio; Rowton, Edgar, 2015, Efficacy of permethrin treated bed nets against Leishmania major infected sand flies, United States Army Medical Department Journal. Jul-Sep. 10-15.
- Chaccour, Carlos; Rabinoivich, Regina; Slater, Hannah; Canavati, Sara; Bousema, Teun; Lacerda, Marcus; ter Kuile, Feiko; Drakeley, Chris; Bassat, Quique; Foy, Brian; Kobylinski, Kevin, 2015, Establishment of the Ivermectin Research for Malaria Elimination Network: updating the research agenda. Malaria Journal. 14: e243.
- Ouedraogo, Andre; Bastiaens, Guido; Tiono, Alfred; Guelbeogo, Wamdaogo; Kobylinski, Kevin; Ouedraogo, Alphonse; Barry, Aissata; Bougouma, Edith; Nebie, Issa; Ouattara, Maurice; et al, 2015, Efficacy and safety of the mosquitoicidal drug ivermectin to prevent malaria transmission after treatment A double-blind, randomized, clinical trial. Clinical Infectious Diseases. 60: 357-65.
- Alout, Haoues; Krajauch, Ben; Meyers, Jacob; Grubaugh, Nathan; Brickney, Doug; Kobylinski, Kevin; Diclaro, Joseph; Bolay, Fatorma; Fakoli, Lawrence; Diabaté, Abdoulaye; Dabiré, Roch; Bougma, Roland; Foy, Brian, 2014, Evaluation of ivermectin mass drug administration for malaria transmission control across different West African environments. Malaria Journal. 13: e417.
- Kobylinski, Kevin; Alout, Haoues; Foy, Brian; Clemets, Archie; Adisakwattana, Poom; Swierczewski, Brett; Richardson, Jason, 2014, Rationale for the co-administration of albendazole and ivermectin to humans for malaria parasite transmission control.
Kobylinski, Kevin Conrad, Generated: 5/18/2017, 1:35 PM

TABLES - ARTICLES

Kobylinski, Kevin, Foy, Brian; Richardson, Jason, 2012, Ivermectin inhibits the sporogony of Plasmodium falciparum in Anopheles gambiae
, Malaria Journal. 11: e381

Kobylinski, Kevin; Foy, Brian: Richardson, Jason, 2012, Ivermectin inhibits the sporogony of Plasmodium falciparum in Anopheles gambiae
, Malaria Journal. 11: e153

Kobylinski, Kevin; Saadeh, David; Ponlawat, Alongkot; Ubalee, Ratawan; Foy, Brian; Yow, Stacie, 2013, Ivermectin to help control malaria: A research agenda for a promising new tool for malaria elimination.
, Malaria Journal. 12: e40.

Kobylinski, Kevin; Sylla, Massamba; Foy, Brian; Richardson, Jason, 2013, GCE Special: Endectocides for controlling transmission of mosquito-borne diseases.

Sylla, Massamba; Kobylinski, Kevin; Foy, Brian, 2013, GCE Special: Endectocides for controlling transmission of mosquito-borne diseases.

Chaccour, Carlos; Kobylinski, Kevin; Bassat, Quique; Bousema, Teun; Drakeley, Chris; Alonso, Pedro; Foy, Brian, 2013, Ivermectin to help control malaria: A research agenda for a promising new tool for malaria elimination.

Kobylinski, Kevin; Foy, Brian; Richardson, Jason, 2012, Ivermectin inhibits the sporogony of Plasmodium falciparum in Anopheles gambiae
, Malaria Journal. 11: e381

ARTICLES - OTHER (PROCEEDINGS, BOOK CHAPTERS, OTHER)

PRESENTATIONS - DOMESTIC

Kobylinski, Kevin; Davidson, Silas; Jittamala, Podjanee; Pekrittayakamee, Sasithon; Hanboonkunupakarn, Borimas; van der Pluijim, Rob; Mekaka, Mavuto; Tarning, Joel; Watanakul, Thanaporn; Dondorp, Arjen; Day, Nicholas; White, Nicholas, 11/15/2016, Mosquito-lethal efficacy of ivermectin, dihydroartemisinin-piperaquine, and primaquine: Ivermectin for Malaria in Southeast Asia (IMSEA Study, Thailand)
, American Society of Tropical Medicine and Hygiene (Atlanta, Georgia)

Kobylinski, Kevin; Ubalee, Ratawan; Ponlawat, Alongkot; Foy, Brian; McCardle, Wes; Davidson, Silas; Wanja, Elizabeth; Szumlas, Daniel; Richardson, Jason, 10/01/2015, Ivermectin inhibits the development of Plasmodium vivax in Anopheles dirus, 64th annual meeting of the American Society of Tropical Medicine and Hygiene, Philadelphia, PA.

Kobylinski, Kevin; Ponlawat, Alongkot; Ubalee, Ratawan; Foy, Brian; Tarning, Joel; Watanakul, Thanaporn; McCardle, Wes; Schuster, Anthony; Szumlas, Daniel; Richardson, Jason. , 11/01/2014, Assessing Ivermectin Susceptibility of Greater Mekong Subregion Malaria Vectors
, 63rd annual meeting of the American Society of Tropical Medicine and Hygiene. New Orleans, LA.

Kobylinski, Kevin; Foy, Brian; Richardson, Jason, 11/01/2012, Ivermectin inhibits the sporogony of Plasmodium falciparum in Anopheles gambiae, 61st annual meeting of the American Society of Tropical Medicine and Hygiene, Atlanta, GA.

Kobylinski, Kevin; Sylla, Massamba; Sylla, Massamba; Foy, Brian; Richardson, Jason, 09/01/2012, Ivermectin for malaria control
, 44th annual meeting of the Society for Vector Ecology, St. Augustine, FL

PRESENTATIONS - INTERNATIONAL

Kobylinski, Kevin; Davidson, Silas; Jittamala, Podjanee; Pekrittayakamee, Sasithon; Hanboonkunupakarn, Borimas; van der Pluijim, Rob; Tarning, Joel; Dondorp, Arjen; Day, Nicholas; White, Nicholas, 09/17/2016, Ivermectin mass drug administration for malaria elimination in the Greater Mekong Subregion, International Conference on Tropical Medicine and Malaria (Brisbane, Australia)

Kobylinski, Kevin; Davidson, Silas; Jittamala, Podjanee; Pekrittayakamee, Sasithon; Hanboonkunupakarn, Borimas; van der Pluijim, Rob; Tarning, Joel; Dondorp, Arjen; Day, Nicholas; White, Nicholas, 04/01/2016, Ivermectin for Malaria in Southeast Asia, WHO Global Malaria Programme, Technical consultation on ivermectin for malaria transmission control. Geneva, Switzerland

Kobylinski, Kevin; Ubalee, Ratawan; Ponlawat, Alongkot; Foy, Brian; McCardle, Wes; Davidson, Silas; Wanja, Elizabeth; Szumlas, Daniel; Richardson, Jason, 03/01/2016, Ivermectin mass drug administration for malaria elimination in the Greater Mekong Subregion, Malaria Consortium, Second Asia Symposium: Addressing infectious diseases through sustainable health systems. Bangkok, Thailand

Kobylinski, Kevin; Ubalee, Ratawan; Ponlawat, Alongkot; Foy, Brian; McCardle, Wes; Davidson, Silas; Wanja, Elizabeth; Szumlas, Daniel; Richardson, Jason, 12/01/2015, Ivermectin inhibits the development of Plasmodium vivax in Anopheles dirus and Anopheles minimus, Joint International Tropical Medicine Meeting. Bangkok, Thailand

Kobylinski, Kevin; Ponlawat, Alongkot; Ubalee, Ratawan; Foy, Brian; Tarning, Joel; Watanakul, Thanaporn; McCardle, Wes; Schuster, Anthony; Szumlas, Daniel; Richardson, Jason, 01/01/2015, Ivermectin mass drug administration to humans as a potential tool for malaria elimination, 10th meeting of the Vector Control Working Group. Geneva, Switzerland

Kobylinski, Kevin; Ponlawat, Alongkot; Ubalee, Ratawan; McCardle, Wes; Schuster, Anthony; Foy, Brian; Tarning, Joel; Wattanakul, Thanaporn; McCardle, Wes; Schuster, Anthony; Szumlas, Daniel; Richardson, Jason, 12/01/2014, Ivermectin mass drug administration for malaria elimination in the Greater Mekong Subregion, Joint International Tropical Medicine Meeting. Bangkok, Thailand

Kobylinski, Kevin; Foy, Brian; Ponlawat, Alongkot; Ubalee, Ratawan; McCardle, Wes; Schuster, Anthony; Szumlas, Daniel; Tarning, Joel; Richardson, Jason, 04/01/2014, Ivermectin mass drug administration as a malaria elimination tool, 3rd meeting of the WHO Technical Expert Group on Drug Resistance Containment. Geneva, Switzerland

Kobylinski, Kevin; Sylla, Massamba; Foy, Brian; Richardson, Jason, 04/01/2014, The potential of ivermectin mass drug administration to humans for Plasmodium vivax control in Southeast Asia: preliminary evidence, 4th meeting of Advances in Plasmodium vivax Malaria Research, Barcelona, Spain

Kobylinski, Kevin; Foy, Brian; Saunders, David; Ponlawat, Alongkot; Ubalee, Ratawan; McCardle, Wes; Schuster, Anthony; Szumlas, Daniel; Richardson, Jason. , 12/01/2013, WRAIR-AFRIMS: the role of ivermectin in malaria elimination, WHO and BMGF: Operational research convening to support accelerating malaria elimination in the context of artemisinin resistant falciparum malaria in the Greater Mekong Sub-Region, Bangkok, Thailand.
NRC Research Associateship Programs

FINAL REPORT

1) Associate Last or Family Name  
ZARLING

First Name  
STASYA

M.I.  
N

2) FORWARDING Address (to which your tax statement will be mailed)  
FORWARDING Phone(s) and E-Mail (if known)

3) Today's Date  
May 16, 2016

Dates of Tenure  
from February 6, 2011  to  May 15, 2016

4) Host Agency  
AMRMC  (e.g., AFRL)

Laboratory or Center  
WRAIR  (e.g., Wright Patterson AFB)

Division / Directorate / Department  
MVB  (e.g., High-Speed Propulsion)

5) Name of Laboratory Adviser (and USMA Mentor, if applicable)  
URSZULA KRZYCH

6) TITLE OF RESEARCH PROPOSAL  
Characterization of Protective Immune Responses After Vaccination Against Plasmodium Species

7) SUMMARY OF RESEARCH DURING TENURE  
Itemize significant findings in concise form, utilizing key concepts/words.

1) Assessment of CD4 and CD8 T cell responses to novel pre-erythrocytic vaccine candidate antigens from human PBMCs collected following immunization with genetically attenuated sporozoites administered by mosquito bite

2) Determination of a critical role for IL-15 in the survival of CD8 central memory cells for protracted protection in mice following vaccination with radiation attenuated sporozoites

3) Assessment of immune responses and dependence on CD8 T cells following immunization with pre-erythrocytic vaccine candidate antigens in mice by DNA or virus vectored immunization

4) Attempted to generate protein antigens in E. coli expression system to use as vaccination platform for selected pre-erythrocytic antigens. This proved to be very difficult with the chosen antigens and subsequently was dropped from the project.

5) Assessed novel vaccine adjuvants and platforms for administration of pre-erythrocytic vaccine candidate antigens (USMA Davies Fellow: please add summary of teaching, including classes taught.)

8) RESEARCH IN PROGRESS  
Describe in no more than 100 words.

Assessment of T cell responses to pre-erythrocytic vaccine antigens from PBMCs collected from human volunteers immunized with radiation attenuated sporozoites (RAS) by the bite of Anopheles mosquitoes.

9) PUBLICATIONS AND PAPERS RESULTING FROM NRC ASSOCIATESHIP RESEARCH  
Provide complete citations: author(s), title, full name of journal, volume number, page number(s), and year of publication.

a) Publications in peer-reviewed journals


The National Academies of  
SCIENCES • ENGINEERING • MEDICINE

b) Books, book chapters, other publications

c) Manuscripts in preparation, manuscripts submitted

10) PATENT OR COPYRIGHT APPLICATIONS RESULTING FROM NRC ASSOCIATESHIP RESEARCH
Provide titles, inventors, and dates of applications.

11) PRESENTATIONS AT SCIENTIFIC MEETINGS OR CONFERENCES
Provide complete references: author(s), title, abstract/proceeding citation, meeting name and location.

International

12) SEMINARS OR LECTURES DELIVERED AT UNIVERSITIES AND/OR INSTITUTES Include dates, names and locations of seminars.

13) PROFESSIONAL AWARDS RECEIVED DURING TENURE
AMERICAN ASSOCIATION OF IMMUNOLOGISTS TRAINEE POSTER AWARD

14) POST-TENURE POSITION / JOB TITLE
RESEARCH MICROBIOLOGIST (IMMUNOLOGY)

15) NAME AND ADDRESS OF POST-TENURE POSITION / JOB ORGANIZATION
WRAIR, MALARIA VACCINE BRANCH

16) POST-TENURE POSITION STATUS / CATEGORY Please indicate only one.
☐ Permanent position at the host agency
☒ Contract or temporary position at the host Agency
Abbreviate Host Laboratory/Center WRAIR
☐ Research/Administrative position with another U.S.-government agency
☐ Research/Administrative position with a foreign-government agency
☐ Research/teaching position at a U.S. college or university
17) (For J-1 visa holders only) **SUMMARY OF CULTURAL AND EDUCATIONAL EXCHANGE DURING TENURE**  
Itemize experiences that your laboratory (LPR and/or Adviser) has offered to you that facilitated your learning about American culture. Also itemize what you have done to share your culture with your colleagues and the community.

1) 
2) 
3) 
4) 
5) 

18) **APPRAISAL OF NRC RESEARCH ASSOCIATESHIP PROGRAM**

On a scale of 1 – 10 (poor - excellent), please rate the following:

**SHORT TERM VALUE**

- Development of knowledge, skills, and research productivity  
  Comments

**LONG TERM VALUE**

- How the NRC Research Associateship award affected your career to date  
  Comments

**LAB SUPPORT**

- Quality of support from the Laboratory--equipment, funding, orientation, safety and health guidelines, etc.  
  Comments

**ADVISER/MENTOR SUPPORT**

- Quality of mentoring from the Laboratory Adviser (USMA Mentor, if applicable)  
  Comments

**LPR SUPPORT**

- Quality of administrative support from the Laboratory Program Representative (LPR)  
  Comments

**NRC RESEARCH ASSOCIATESHIP PROGRAMS SUPPORT**

- Quality of administrative support. Please assess the support you received from the Fellowships Office (e.g., moving company, insurance, Omega, payroll, Program Coordinator, travel, etc.)  
  Comments

18) **PLEASE PROVIDE ANY SUGGESTIONS FOR PROGRAM IMPROVEMENT.**

Include information regarding Occupational Health Exam procedures on the website.

Please do NOT scan to PDF. Send the Final Report as MSWord document via e-mail to your Program Coordinator.

**No handwritten signature required; but you may upload a scanned signature file below:**

Leah Probst: lprobst@nas.edu  
Linda Sligh: lsligh@nas.edu  
Melanie Suydam: msuydam@nas.edu  
Peggy Wilson: pwilson@nas.edu

Id# Rev. October 2015 Proj/Act ID#