MEMORANDUM FOR SGTT
ATTN: CAPT ANDREW PATTERSON

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

1. Your paper, entitled *Dynamics of the Dermatologic Microbiome in U.S. Air Force Basic Training* presented at/published to *2017 Department of Defense Microbiome Symposium, Colorado Springs, CO, 5-7 April 2017* in accordance with MDWI 41-108, has been approved and assigned local file #17161.

2. Pertinent biographic information (name of author(s), title, etc.) has been entered into our computer file. Please advise us (by phone or mail) that your presentation was given. At that time, we will need the date (month, day and year) along with the location of your presentation. It is important to update this information so that we can provide quality support for you, your department, and the Medical Center commander. This information is used to document the scholarly activities of our professional staff and students, which is an essential component of Wilford Hall Ambulatory Surgical Center (WHASC) internship and residency programs.

3. Please know that if you are a Graduate Health Sciences Education student and your department has told you they cannot fund your publication, the 59th Clinical Research Division may pay for your basic journal publishing charges (to include costs for tables and black and white photos). We cannot pay for reprints. If you are a 59 MDW staff member, we can forward your request for funds to the designated Wing POC at the Chief Scientist’s Office, Ms. Alice Houy, office phone: 210-292-8029; email address: alice.houy.civ@mail.mil.

4. Congratulations, and thank you for your efforts and time. Your contributions are vital to the medical mission. We look forward to assisting you in your future publication/presentation efforts.

LINDA STEEL-GOODWIN, Col, USAF, BSC
Director, Clinical Investigations & Research Support

Warrior Medics — Mission Ready — Patient Focused
The Joint Ethics Regulation (JER) DoD 5500.07-R, Standards of Conduct, provides standards of ethical conduct for all DoD personnel and their interactions with other non-DoD entities, organizations, societies, conferences, etc. Part of the Form 3039 review and approval process includes a legal ethics review to address any potential conflicts related to DoD personnel participating in non-DoD sponsored conferences, professional meetings, publication/presentation disclosures to domestic and foreign audiences, DoD personnel accepting non-DoD contributions, awards, honoraria, gifts, etc. The specific circumstances for your presentation will determine whether a legal review is necessary. If you (as the author) or your supervisor check "YES" in block 17 of the Form 3039, your research or technical documents will not be forwarded to the 502 ISG/JAC legal office for an ethics review. To assist you in making this decision about whether to request a legal review, the following examples are provided as a guideline:

For presentations before professional societies and likeminded organizations, the 59 MDW Public Affairs Office (PAO) will provide the needed review to ensure proper disclaimers are included and the subject matter of the presentation does not create any conflict for DoD concern.

If the sponsor of a conference or meeting is a DoD entity, an ethics review of your presentation is not required, since the DoD entity is responsible to obtain all approvals for the event.

If the sponsor of a conference or meeting is a non-DoD commercial entity or an entity seeking to do business with the government, then your presentation should have an ethics review.

If your travel is being paid for (in whole or in part) by a non-Federal entity (someone other than the government), a legal ethics review is needed. These requests for legal review should come through the 59 MDW Gifts and Grants Office to 502 ISG/JAC.

If you are receiving an honorarium or payment for speaking, a legal ethics review is required.

If you (as the author) or your supervisor check "YES" in block 17 of the Form 3039, your research or technical documents will be forwarded simultaneously to the 502 ISG/JAC legal office and PAO for review to help reduce turn-around time. If you have any questions regarding legal reviews, please contact the legal office at (210) 671-5795/33685, DSN 473.

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement:
"The views expressed are those of the [author(s)] [presenter(s)] and do not reflect the official views or policy of the Department of Defense or its Components."

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement for research involving humans:
"The voluntary, fully informed consent of the subjects used in this research was obtained as required by 32 CFR 219 and DODI 3216.02_AFI 40-402."

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement for research involving animals, as required by AFMAN 40-401_IP: 80-23, Guide for the Care and Use of Laboratory Animals and the Animal Welfare Act of 1966, as amended."
28 Mar 2017

Dynamics of the dermatologic microbiome in military members

Dynamics of the dermatologic microbiome in U.S. Air Force Basic Training

Funding received for this study? 

Yes 

No FUNDING SOURCE: AFMSA

Do you need funding support for publication purposes? 

Yes 

No

Is this material classified? 

Yes 

No

Is this material subject to any legal restrictions for publication or presentation through a collaborative research and development agreement (CRADA), material transfer agreement (MTA), intellectual property rights agreement etc.? 

Yes 

No

Material is for: 

Domestic release

Foreign Release

Check appropriate box or boxes for approval with this request. Attach copy of material to be published/presented.

Publication/Journal

Published Abstract (List intended publication/journal)

Poster

Platform Presentation

Other

Have your attached research/technical materials been previously approved to be published/presented? 

Yes 

No

Protocol title: (Note: For each new release of medical research or technical information as a publication/presentation, a new 59 MDW Form 3039 must be submitted for review and approval.)

Declarations of Medical Research

1. PRIMARY POINT OF CONTACT (Last Name, First Name, M.I., email)

Patterson, Andrew T, PattersonAT1@gmail.com

18. DUTY PHONE/PAGER NUMBER

210-671-9740 (330-701-5183)

16. AUTHORSHIP AND CO-AUTHOR(S) List in the order they will appear in the manuscript.

<table>
<thead>
<tr>
<th>LAST NAME, FIRST NAME</th>
<th>GRADE/RANK</th>
<th>SQUADRON/GROUP/OFFICE SYMBOL</th>
<th>INSTITUTION (ifo not 59 MDW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patterson, Andrew, T</td>
<td>Capt/O-3</td>
<td>559 THLS/59 MDG/SGTT</td>
<td></td>
</tr>
<tr>
<td>Beachkofsky, Thomas, M</td>
<td>Maj/O-4</td>
<td>59 Pilot Research Division/SGO</td>
<td></td>
</tr>
<tr>
<td>Webber, Bryant, J</td>
<td>Maj/O-4</td>
<td>59 THLS/Preventative Medicine</td>
<td></td>
</tr>
<tr>
<td>Noc, Jody, C</td>
<td>Civ</td>
<td>59 MDW Clinical Research Div/SGVUL</td>
<td></td>
</tr>
<tr>
<td>Lenz, Brittany, L</td>
<td>Capt/O-3</td>
<td>59 MDW Dept of Dermatology</td>
<td></td>
</tr>
</tbody>
</table>

17. Is a 502 ISG/JAC Ethics Review Required (JER DOD 5500.07-R)? 

Yes 

No

I certify any human or animal research related studies were approved and performed in strict accordance with 32 CFR 219, AFMAN 40-001, and 59 MDW 41-108. I have read the final version of the attached material and certify that it is an accurate manuscript for publication and/or presentation.

19. Author's Signature

Andrew T Patterson

20. Date

28 Mar 2017

Maria J. Belmonte, Lt Col, O-5, Flight Commander, Trainee Health

22. Approving Authority’s Signature

Belmonte

23. Date

28 Mar 2017

59 MDW Form 3039. 20160628 Previous editions are obsolete
**Presentation of IRB approved research effort with appropriate disclaimers. approved**

<table>
<thead>
<tr>
<th>30. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER</th>
<th>31. REVIEWER SIGNATURE</th>
<th>32. DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kevin Kupferer/GS13/Human Res Subj Prot Expert</td>
<td>KUPFERER.Kevin.R.1</td>
<td>29 March 2017</td>
</tr>
</tbody>
</table>

**Comments**

Presentation of IRB approved research effort with appropriate disclaimers. approved

<table>
<thead>
<tr>
<th>33. DATE RECEIVED</th>
<th>34. DATE FORWARDED TO 59 MDWPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>29 March 2017</td>
<td></td>
</tr>
</tbody>
</table>

**Comments**

Presentation of IRB approved research effort with appropriate disclaimers. approved

<table>
<thead>
<tr>
<th>35. COMMENTS</th>
<th>36. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER</th>
<th>37. REVIEWER SIGNATURE</th>
<th>38. DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ APPROVED</td>
<td>Kevin Kupferer/GS13/Human Res Subj Prot Expert</td>
<td>KUPFERER.Kevin.R.1</td>
<td>29 March 2017</td>
</tr>
</tbody>
</table>

**Comments**

Presentation of IRB approved research effort with appropriate disclaimers. approved

<table>
<thead>
<tr>
<th>39. DATE RECEIVED</th>
<th>40. DATE FORWARDED TO 59 MDWPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 6, 2017</td>
<td>April 7, 2017</td>
</tr>
</tbody>
</table>

**Comments**

Presentation of IRB approved research effort with appropriate disclaimers. approved

<table>
<thead>
<tr>
<th>41. COMMENTS</th>
<th>42. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER</th>
<th>43. REVIEWER SIGNATURE</th>
<th>44. DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ APPROVED</td>
<td>Kevin Inuma, SSgt/E-5, 59 MDW Public Affairs</td>
<td>INUMA.Kevin.MITSUGU.</td>
<td>April 7, 2017</td>
</tr>
</tbody>
</table>

**Comments**

Presentation of IRB approved research effort with appropriate disclaimers. approved

<table>
<thead>
<tr>
<th>45. DATE RECEIVED</th>
<th>46. SENIOR AUTHOR NOTIFIED BY PHONE OF APPROVAL OR DISAPPROVAL</th>
<th>47. COMMENTS</th>
<th>48. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER</th>
<th>49. REVIEWER SIGNATURE</th>
<th>50. DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES NO COULD NOT BE REACHED LEFT MESSAGE</td>
<td>☐ APPROVED</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments**

Presentation of IRB approved research effort with appropriate disclaimers. approved
DYNAMICS OF THE DERMATOLOGIC MICROBIOME IN U.S. AIR FORCE BASIC TRAINING

Andrew Patterson, MD; Thomas Beachkofsky, MD; Bryant Webber, MD, MPH; Brittany Lenz, MD; Patrick Brown, MD; Jody Noe, PhD; Michael Grinkemeyer, MD; James Baldwin, PhD; Heather Yun, MD

158th Medical Group, 58th Medical Wing, Joint Base San Antonio-Lackland, Texas; 2Department of Dermatology, 58th Medical Wing, Joint Base San Antonio-Lackland, Texas; 358th Clinical Research Division, Joint Base San Antonio-Lackland, Texas; 411th USAFAMEDT Applied Technology & Genomics, Patterson Air Force Base, Ohio; 5Department of Infectious Disease, 58th Medical Wing, Joint Base San Antonio-Lackland, Texas

BACKGROUND

Cutting-edge metagenomic sequencing technology is increasingly available and cost-effective avenue for population-based clinical studies. The skin flora represents a relatively unexplored niche of microbiome research despite its many unexplored linkages to host health and disease. The dermatologic microbiome possesses wide-ranging potential clinical and operational military applications including:

- Pre- and post-deployment screening
- Occupational hazard identification
- Global health bioterrorism
- Personalized medicine and biomarker detection
- Identifying at-risk patients for infections in the surgical stage
- Guiding regional antibiotics including emerging antibiotic resistant organisms
- Future inquiry into systemic and topical interventions to modulate cutaneous microbiota homeostasis after antibiotic use

As a leading cause of morbidity among U.S. service members and trainees in both combat and standard occupational locales, skin and soft tissue infections (STIs) have a major impact, both current and future operational readiness. Basic military trainees face unique environmental influences during their highly-regimented 8 week training course including working within a flight of approximately 50 individuals for nearly 24 hours a day and receiving universal chemoprophylaxis against Group A beta-hemolytic streptococcus through year-round provision of biologic LA 1.2M intramuscular units during in-processing.

U.S. Air Force Basic Military Training

- Approximately 39,000 U.S. Air Force Basic Military Trainees complete their initial enlisted training at Joint Base San Antonio-Lackland, Texas, each year
- The documented SSTI rate for all basic military trainees from 2012 to 2014 was 0.82%
- This results in an estimated 390 SSTIs annually with a combined financial burden to the U.S. Air Force of $446,940 encompassing purely antibiotic costs and missed training days (not including healthcare facility staffing and operational costs)

METHODS

TAXON

<table>
<thead>
<tr>
<th>Nature Name</th>
<th>Scientific Name</th>
<th>Hits</th>
<th>Average Score</th>
<th>Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacillus anthracis</td>
<td>Bacillus anthracis str. 95014</td>
<td>30</td>
<td>62.00</td>
<td>2</td>
</tr>
<tr>
<td>Bacillus cereus</td>
<td>Bacillus cereus ATCC 10876</td>
<td>14</td>
<td>70.00</td>
<td>4</td>
</tr>
<tr>
<td>Burkholderia cepacia</td>
<td>Burkholderia cepacia</td>
<td>32</td>
<td>129.00</td>
<td>2</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>Escherichia coli O157:H7 str. SS17</td>
<td>23</td>
<td>209.50</td>
<td>2</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>Escherichia coli O5:K4(L):H4 str. ATCC 23502</td>
<td>74</td>
<td>168.75</td>
<td>4</td>
</tr>
<tr>
<td>Neisseria meningitidis</td>
<td>Neisseria meningitidis 6103</td>
<td>19</td>
<td>96.33</td>
<td>3</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>Pseudomonas aeruginosa VRFPA04</td>
<td>163</td>
<td>123.00</td>
<td>4</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>Staphylococcus aureus M1300</td>
<td>1</td>
<td>138.00</td>
<td>1</td>
</tr>
<tr>
<td>Vibrio parahaemolyticus</td>
<td>Vibrio parahaemolyticus UCM-V493</td>
<td>5</td>
<td>38.33</td>
<td>3</td>
</tr>
</tbody>
</table>

FIGURE 1 - SELECTED MICROORGANISM YIELDS FROM TRIAL AGNOSTIC SEQUENCING PERFORMED ON 4 HEALTHY VOLUNTEER PALMAR SWABS

INVESTIGATORS FROM THE 58TH MEDICAL WING AND THE 71ST HUMAN PERFORMANCE WING PARTNERED TO DESIGN A JOINT STEELE FLATABILITY STUDY UTILIZING EMERGING GENOMIC SEQUENCING TECHNOLOGIES TO ASSESS CHANGES IN MICROBIAL COLONIZATION OF THE SKIN IN THE BASIC MILITARY TRAINEE POPULATION IN RESPONSE TO COMMUNAL LIVING AND UNIVERSAL GROUP A STRIP CHEMOPROPHYLAXIS.

Planning and Approval Steps

- Received permission from the 737th Training Group commander to utilize 10 flights of new basic military trainee flights, 5 male and 5 female, encompassing an estimated 500 participating subjects and capitalizing on the extant process of randomized allocation of new trainees
- Obtained approval from the 58th Medical Wing Institutional Review Board (FWH 20170033H) to begin anticipated subject enrollment beginning summer 2017 with an anticipated start date of fall 2017
- Small scale validation trials of hand microbiota from 4 subjects are in progress to optimize collection, transport, analysis, and interpretation models for each of the parallel bacterial and agnostic sequencing arms. A sample of initial preliminary agnostic data is shown in Figure 1.

GOALS

- Further establish a framework for skin microbiome data collection, analysis, and interpretation in Department of Defense laboratories as non-invasive screening tool
- Define an epidemiologic baseline for the effects of systemic antibiotic administration on the cutaneous microbiota
- Demonstrate the skin flora shifts that occur as a result of communal living in the BMT population
- Identify dominant and potentially high risk microorganism signatures that may predispose trainees to skin and soft tissue infections

Quantified metagenomic analysis of the epidemiologic changes in the collective dermatologic microbiome are being compared based on shifts in microbiota flora frequencies according to:

- Gender
- Dorm and occupational exposures
- Temporal relation to penicillin administration
- Known pathogenic and non-pathogenic microorganisms

REFERENCES