



DEPARTMENT OF THE AIR FORCE
59TH MEDICAL WING (AETC)
JOINT BASE SAN ANTONIO - LACKLAND TEXAS



25 APR 2017

MEMORANDUM FOR ST

ATTN: RAQUEL L. LOPEZ

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

1. Your paper, entitled **Research Today Volume 3, Issue 2 April 2017 - Newsletter** presented at/published to **General Distribution; Available on 59 MDW/ST AFMS Kx Site, Email Distribution, etc** in accordance with MDWI 41-108, has been approved and assigned local file #**17208**.
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

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

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

INSTRUCTIONS

USE ONLY THE MOST CURRENT 59 MDW FORM 3039 LOCATED ON AF E-PUBLISHING

1. The author must complete page two of this form:
 - a. In Section 2, add the funding source for your study [e.g., 59 MDW CRD Graduate Health Sciences Education (GHSE) (SG5 O&M); SG5 R&D; Tri-Service Nursing Research Program (TSNRP); Defense Medical Research & Development Program (DMRDP); NIH; Congressionally Directed Medical Research Program (CDMRP) ; Grants; etc.]
 - b. In Section 2, there may be funding available for journal costs, if your department is not paying for figures, tables or photographs for your publication. Please state "YES" or "NO" in Section 2 of the form, if you need publication funding support.
2. Print your name, rank/grade, sign and date the form in the author's signature block or use an electronic signature.
3. Attach a copy of the 59 MDW IRB or IACUC approval letter for the research related study. If this is a technical publication/presentation, state the type (e.g. case report, QA/QI study, program evaluation study, informational report/briefing, etc.) in the "Protocol Title" box.
4. Attach a copy of your abstract, paper, poster and other supporting documentation.
5. Save and forward, via email, the processing form and all supporting documentation to your unit commander, program director or immediate supervisor for review/approval.
6. On page 2, have either your unit commander, program director or immediate supervisor:
 - a. Print their name, rank/grade, title; sign and date the form in the approving authority's signature block or use an electronic signature.
7. Submit your completed form and all supporting documentation to the CRD for processing (59crdpubspres@us.af.mil). **This should be accomplished no later than 30 days before final clearance is required to publish/present your materials.** If you have any questions or concerns, please contact the 59 CRD/Publications and Presentations Section at 292-7141 for assistance.
8. The 59 CRD/Publications and Presentations Section will route the request form to clinical investigations, 502 ISG/JAC (Ethics Review) and Public Affairs (59 MDW/PA) for review and then forward you a final letter of approval or disapproval.
9. Once your manuscript, poster or presentation has been approved for a one-time public release, you may proceed with your publication or presentation submission activities, as stated on this form. **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.
10. If your manuscript is accepted for scientific publication, please contact the 59 CRD/Publications and Presentations Section at 292-7141. This information is reported to the 59 MDW/CC. All medical research or technical information publications/presentations must be reported to the Defense Technical Information Center (DITC). See 59 MDWI 41-108, *Presentation and Publication of Medical and Technical Papers*, for additional information.
11. 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 "NO" 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 like 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 cause 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) 671-5795/3365, 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_AF1 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 :

"The experiments reported herein were conducted according to the principles set forth in the National Institute of Health Publication No. 80-23, Guide for the Care and Use of Laboratory Animals and the Animal Welfare Act of 1966, as amended."

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

1. TO: CLINICAL RESEARCH	2. FROM: (Author's Name, Rank, Grade, Office Symbol) Lopez, Raquel L., CTR, 59 MDW/ST	3. GME/GHSE STUDENT: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	4. PROTOCOL NUMBER: NA
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5. 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.)
NA

6. TITLE OF MATERIAL TO BE PUBLISHED OR PRESENTED:
Research Today Volume 3, Issue 2 April 2017 - Newsletter

7. FUNDING RECEIVED FOR THIS STUDY? YES NO FUNDING SOURCE:

8. DO YOU NEED FUNDING SUPPORT FOR PUBLICATION PURPOSES: YES NO

9. IS THIS MATERIAL CLASSIFIED? YES NO

10. 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 NOTE: If the answer is YES then attach a copy of the Agreement to the Publications/Presentations Request Form.

11. 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.

11a. PUBLICATION/JOURNAL (List intended publication/journal.)

11b. PUBLISHED ABSTRACT (List intended journal.)

11c. POSTER (To be demonstrated at meeting: name of meeting, city, state, and date of meeting.)

11d. PLATFORM PRESENTATION (At civilian institutions: name of meeting, state, and date of meeting.)

11e. OTHER (Describe: name of meeting, city, state, and date of meeting.)
General Distribution; Available on 59 MDW/ST AFMS Kx Site, Email Distribution, etc.

12. HAVE YOUR ATTACHED RESEARCH/TECHNICAL MATERIALS BEEN PREVIOUSLY APPROVED TO BE PUBLISHED/PRESENTED?
 YES NO ASSIGNED FILE # _____ DATE _____

13. EXPECTED DATE WHEN YOU WILL NEED THE CRD TO SUBMIT YOUR CLEARED PRESENTATION/PUBLICATION TO DTIC
NOTE: All publications/presentations are required to be placed in the Defense Technical Information Center (DTIC).

DATE
NA

14. 59 MDW PRIMARY POINT OF CONTACT (Last Name, First Name, M.I., email) Lopez, Raquel, L., raquel.l.lopez6.ctr@mail.mil	15. DUTY PHONE/PAGER NUMBER 210-292-3366
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16. AUTHORSHIP AND CO-AUTHOR(S) List in the order they will appear in the manuscript.

LAST NAME, FIRST NAME AND M.I.	GRADE/RANK	SQUADRON/GROUP/OFFICE SYMBOL	INSTITUTION (If not 59 MDW)
a. Primary/Corresponding Author Lopez, Raquel L.	CTR	59 MDW/ST	
b.			
c.			
d.			
e.			

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 40-401_IP, AND 59 MDWI 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.

18. AUTHOR'S PRINTED NAME, RANK, GRADE Lopez, Raquel L. CTR, 59 MDW/ST	19. AUTHOR'S SIGNATURE LOPEZ.RAQUEL.LYNN.1390331670	20. DATE 14 APRIL 2017
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21. APPROVING AUTHORITY'S PRINTED NAME, RANK, TITLE Debra M. Niemeyer, PhD, GS-15, DAF, Chief Scientist	22. APPROVING AUTHORITY'S SIGNATURE NIEMEYER.DEBRA.M.1022593567	23. DATE 14 April 2017
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PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

1st ENDORSEMENT (59 MDW/SGVU Use Only)

TO: Clinical Research Division 59 MDW/CRD Contact 292-7141 for email instructions.	24. DATE RECEIVED 4/14/2017	25. ASSIGNED PROCESSING REQUEST FILE NUMBER 17208
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26. DATE REVIEWED April 19, 2017	27. DATE FORWARDED TO 502 ISG/JAC
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28. AUTHOR CONTACTED FOR RECOMMENDED OR NECESSARY CHANGES: NO YES If yes, give date. _____ N/A

29. COMMENTS APPROVED DISAPPROVED
 S&T newsletter with appropriate disclaimers. Approved

30. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER Kevin Kupferer/GS13/Human Research Subject Protection Expert	31. REVIEWER SIGNATURE KUPFERER,KEVIN.R.1086667270 <small>Digitally signed by KUPFERER,KEVIN.R.1086667270 DN: cn=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USAF, email=KUPFERER,KEVIN.R.1086667270 Date: 2017.04.19 14:18:27 -0500</small>	32. DATE April 19, 2017
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2nd ENDORSEMENT (502 ISG/JAC Use Only)

33. DATE RECEIVED	34. DATE FORWARDED TO 59 MDW/PA
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35. COMMENTS APPROVED (In compliance with security and policy review directives.) DISAPPROVED

36. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER	37. REVIEWER SIGNATURE	38. DATE
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3rd ENDORSEMENT (59 MDW/PA Use Only)

39. DATE RECEIVED April 24, 2017	40. DATE FORWARDED TO 59 MDW/SGVU April 25, 2017
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41. COMMENTS APPROVED (In compliance with security and policy review directives.) DISAPPROVED

42. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER Kevin Iinuma, SSgt/E-5, 59 MDW Public Affairs	43. REVIEWER SIGNATURE <small>Digitally signed by IINUMA,KEVIN MITSUGU 1296227613 DN: cn=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USAF, cn=IINUMA,KEVIN MITSUGU 1296227613 Date: 2017.04.25 07:49:05 -0500</small>	44. DATE April 25, 2017
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4th ENDORSEMENT (59 MDW/SGVU Use Only)

45. DATE RECEIVED	46. SENIOR AUTHOR NOTIFIED BY PHONE OF APPROVAL OR DISAPPROVAL <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> COULD NOT BE REACHED <input type="checkbox"/> LEFT MESSAGE
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47. COMMENTS APPROVED DISAPPROVED

48. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER	49. REVIEWER SIGNATURE	50. DATE
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59TH MEDICAL WING/SCIENCE & TECHNOLOGY NURSE SCIENTISTS ATTEND GATEWAY ACADEMY

By Maj Cubby Gardner, 59th Medical Wing Science and Technology

This Issue

59th Medical Wing/ Science & Technology Nurse Scientists Attend Gateway Academy	1-2
QIPS Cell StandUp	2
Dr. Kevin Wu Wins 2nd Place at the American Association of Pharmaceutical Scientists (AAPS)	3
CPT Samuel Tahk Wins Best in Category at the American Burn Association (ABA)	3
Dr. Nicholas Robbins Wins the Paul Myers Award at the Society of Military Surgeons (SMS)	3
The New Incoming US Army Institute of Surgical Research Deputy Commander and Director of RESTOR™ Col(s) Erik Weitzel	4
59th Clinical Research Division Laboratory Branch Support: Genomic and Epigenetic PTSD	5-6
Science & Technology Contact Information	7



The Office of the Chief Scientist Nursing Research Division's Nurse Scientists Lt Col Jacqueline Killian and Maj Cubby Gardner are among the most recent graduates of the 59th Medical Wing's Gateway Academy. Applying both scientific expertise and newly acquired Gateway Academy techniques, they each presented projects that support the 59th Medical Wing's mission and align with the strategic goals for improving data quality and analysis, and improving operational efficiency.

The Gateway Academy, a product of the 59th Medical Wing's Gateway Innovation Center, is a 9-day course designed to inspire creative problem solving through proven techniques adapted from decades of manufacturing and customer service research and experience. The course is broken into three monthly blocks of three consecutive days and culminates in each student presenting a well-developed process improvement project vetted by Gateway Academy faculty and sponsored by the attendee's leadership.

NURSE SCIENTISTS ATTENDS GATEWAY ACADEMY CONTINUED...

Regarding the return on the investment of time, Col Brenda Morgan, Director of Nursing Research said, "With the Wing's focus on innovation and continuous quality improvement, I felt it was important for the nurse scientists to cultivate ability and familiarity with these techniques to clarify how we add value to the organization. Knowledge gained from this experience will boost nursing research and Science and Technology's overall ability to advance the mission of the 59th Medical Wing."

Maj Gardner's project titled, "Standardized Capture and Display of Nursing Research Division Productivity Data," was designed to meet the objective of reducing variability in the way nurse scientists' work is captured and reported to leadership. This project is expected to facilitate more timely production of productivity reports with improved information accuracy. "We hope to have a better data collection and information display process in place by the end of May," Maj Gardner said. The project established a common framework for collecting and communicating productivity quickly.

Lt Col Killian's project titled, "59 MDW Nursing Research Division Marketing Program" was designed to improve the way information about the nursing research division is presented to leadership to promote better understanding and utilization of nurse scientists as a mission asset. The project is expected to provide leadership with greater awareness of nursing research division capabilities, and will be measured with an assessment tool utilized for higher level Air Force Medical Service (AFMS) assessment. "Some 59th Medical Wing leadership and staff are not aware that the AFMS has a small community of nurse scientists, three of which are located here within 59th Medical Wing, Science and Technology. This project provides a great opportunity to highlight the multifaceted nurse scientist role and how it benefits the 59th Medical Wing and the AFMS," Lt Col Killian said.

In addition to Lt Col Killian and Maj Gardner, other ST graduates of the Gateway Academy include, Dr. Kevin Kupferer and Dr. Linda Harris, "59th CRD Approved Drug List Review"; Ms. Maria Dominguez and Mr. Danny Schultz, "GME Live Tissue Data-call Report to SGE-C"; and Deputy Chief Scientist Lt Col Kevin Steel, "3039 Turnaround Time". Other 59 MDW/ST Gateway Academy graduates include Michael McCausland and Dr. Victor Sylvia. Information on additional projects will be provided in further editions.

QIPS CELL STANDUP

Science and Technology recently stood up a dedicated team to support the 59 MDW innovative efforts on quality improvement and patient safety projects derived through the Gateway Academy. The ST-QIPS cell is composed of senior scientists which can assist with project design, research determination, database setup and statistical support. In addition, this team can provide advice on creative ways to display complex data when individuals are presenting their work in various venues. The ST-QIPS cell is also involved with Gateway Academy efforts to educate and develop innovative thinkers at all levels of experience both through dedicated briefings and attendance at Gateway project presentations. ST expects that the QIPS cell will be well utilized. For more information please email the Deputy Chief Scientist, Lt Col Kevin Steel at kevin.e.steel.mil@mail.mil.

DR. KEVIN WU WINS 2ND PLACE AT THE AMERICAN ASSOCIATION OF PHARMACEUTICAL SCIENTISTS (AAPS)



Kevin Wu, Ph.D. was born and raised in Los Angeles, California and received an undergraduate degree for Psychology at the University of California, Irvine in 2004. He completed medical school at Ross University School of Medicine, receiving his medical degree in 2012. He completed 2 years of General Surgery Residency at UTHSCSA and is currently in his 2nd research year with RESTOR™ (Restorative Endeavor for Service members Through Optimization of Reconstruction). Dr. Wu presented a poster entitled “Hyperbaric norm thermic perfusion mitigates reperfusion injury in porcine Vascular Composite Allotransplantation (VCA)” at the American Association of Plastic Surgeons 96th Annual Meeting and Symposia. His poster won 2nd place for the AAPS Resident Poster Presentation.

CPT SAMUEL TAHK WINS BEST IN CATEOGRY AT THE AMERICAN BURN ASSOCIATION (ABA)

Captain Samuel Tahk, USA, MC, a California native and soccer enthusiast, graduated from UCLA undergraduate-Biochemistry, UCLA-Molecular Biology Ph.D., UC Davis Medical MD. He is currently a General surgery resident at SAMMC, and is a research fellow within the RESTOR™ program. CPT Tahk presented a poster entitled “A Novel Bioresorbable, Biontegratable, and Biocompatible Dressing for Negative Pressure Wound Therapy” at the American Burn Association 49th Annual Meeting in Boston, MA. His poster won “Best in Category” in the Wounds-Clinical Category at this meeting.



DR. NICHOLAS ROBBINS WINS THE PAUL MYERS AWARD AT THE SOCIETY OF MILITARY SURGEONS (SMS)



Nicholas Robbins, MD (CIV), graduated as valedictorian of his class from Rocky Vista University College of Medicine (COM) in 2014. He began a 7-year surgical residency at University of Texas Health Science Center in San Antonio, which includes a 2-year research fellowship. His work with the RESTOR™ program began in 2016. He plans to pursue a reconstructive plastic surgery and craniofacial fellowship after completing his current surgical residency. His abstract, entitled “Hyperbaric Normothermic Perfusion Mitigates Reperfusion Injury in Porcine Vascular Composite Allotransplantation” was accepted for podium presentation at the Society of Military Surgeons 2017 Symposium. He received the Paul Myers Award, given to the 1st Place award in the Basic Science session on behalf and recognition of Lt Gen Paul Meyers.

**THE NEW INCOMING US ARMY INSTITUTE OF SURGICAL RESEARCH
DEPUTY COMMANDER AND DIRECTOR OF RESTOR™,
COL(S) ERIK WEITZEL**



Col(s) Erik K. Weitzel MD, MC, USAF is the incoming Deputy Commander of the US Army Institute of Surgical Research, USAMRMC Joint Base San Antonio, Texas. The USAISR is the nation's premier tri-service research organization that integrates safety into planning and executing registry-base and translational research providing innovative solutions for burn, trauma, and combat casualty care from the time of injury through rehabilitation.

Col(s) Weitzel was commissioned as an officer to the Air Force in 1996 in Chicago, IL while attending University of Chicago's Pritzker School of Medicine. After obtaining his MD, he matriculated to Baylor College of Medicine in Houston, Texas for his General Surgery Internship and Otolaryngology residency. In 2004, Dr. Weitzel joined the Otolaryngology Department at Wilford Hall Medical Center as Officer in Charge of Clinical Operations. Seeking further clinical advancement, Col(s) Weitzel applied for and became the first OCONUS AFIT-funded surgical fellowship.

In 2007, he PCS'd to Adelaide, Australia to begin his training to become the first endoscopic skull base surgeon in the Department of Defense. In 2008, Dr. Weitzel rejoined Wilford Hall's faculty and

enjoyed a rich academic experience to include promotion to Professor of Surgery at the Uniformed Services University of Health Science; and he also served as co-director of the DOD's Comprehensive Skull base Team, Adjunct Associate Professor at UTHSCSA, Program Director of San Antonio Uniformed Services Health Education Consortium (SAUSHEC) Otolaryngology, Chairman of SAUSHEC Supervision Subcommittee, Flight Commander of 59MDOS/SO20 ENT and Audiology, Chairman of JBSA Otolaryngology Department, and was the recipient of the prestigious SAUSHEC Gold Headed Cane award. Dr. Weitzel also leads the RESTOR™ Program (Restorative Endeavor for Service members Through Optimization of Reconstruction), whose mission is to advance the science of Vascularized Composite Allotransplantation (VCA), immunomodulation, and regenerative medicine to optimize reconstructive potential for injured service members.

Education:

- 1995 Bachelor of Science in Engineering, honors and distinction, Duke University, Durham NC
- 1999 Doctor of Medicine Degree, University of Chicago, Pritzker School of Medicine, Chicago, IL
- 2000 General Surgery Internship, Baylor College of Medicine, Houston, TX
- 2004 Otolaryngology Residency, Baylor College of Medicine, Houston, TX
- 2008 Rhinology and Endoscopic Skullbase Surgery, University of Adelaide, South Australia
- 2015 Air War College graduate (by correspondence)

59TH CLINICAL RESEARCH DIVISION LABORATORY BRANCH SUPPORT: GENOMIC AND EPIGENETIC PTSD PROTOCOLS

Genomic testing. In support of the protocol, “Adverse childhood experience and serotonin transporters: a gene environmental interaction study of the risk of PTSD in soldiers (ACES)”, Captain Jonathan Thomas requested Single Nucleotide Polymorphism (SNP) and Whole Exome Next Generation Sequencing (NGS) to query for genetic links to Post Traumatic Stress Disorder (PTSD) from the 59 MDW CRD laboratory.

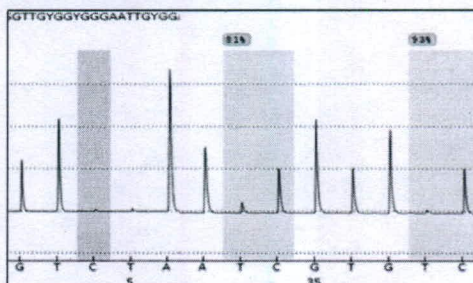
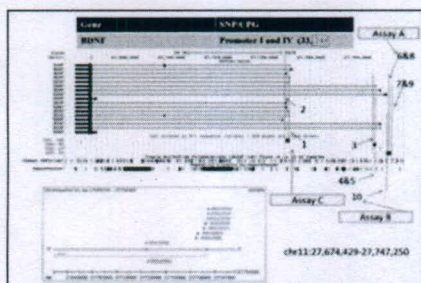
The 59 MDW Clinical Research Division (CRD) laboratory branch is analyzing the genotypes of subjects with PTSD as well as control subjects without PTSD to identify genes that may be linked to this disease. Two main testing strategies are being performed for the genetic arm of the study. The first (SNP testing) involves standard Real-time Polymerase Chain Reaction (PCR) to assess for a single nucleotide, and the second (NGS testing) involves the use of an advanced molecular technique called Next Generation Sequencing which can sequence the entire human genome.

SNP (pronounced “snip”) testing is utilized to assess for one of the 3 billion DNA building blocks which are nucleotides that comprises the human genome. For example, a SNP may replace the nucleotide cytosine (C) with the nucleotide thymine (T) in a certain stretch of DNA. The Principle investigator selected SNPs from the over 10 million SNPs in the human genome that are in genes thought to be important to PTSD.

In addition to the SNP testing the ST CRD laboratory branch is utilizing Next Generation Sequencing for whole exome sequencing on a subset of 20 control (without PTSD) and 20 subjects with PTSD. The whole exome sequencing data will provide genetic data encompassing all exons of the protein coding regions of the entire genome which includes over 20,000 genes. The initial analysis from the NGS testing will focus on 12 genes selected by the Principle Investigator. The NGS data will continued to be stored at the CRD as part of the Institutional Review Board approved data/tissue repository associated with the protocol. This sequence data will facilitate future PTSD research. The exome NGS testing will not only provide additional data to the investigator with respect to the number of SNPs queried, this type of sequencing can potentially lead to the discovery of new genotypes that may be linked with PTSD.

ST/CRD is focused on supporting Clinical Investigations Program Protocols, and this new capability is instrumental to acquainting our new clinicians on the importance of research supporting precision medicine.

59TH CLINICAL RESEARCH DIVISION LABORATORY BRANCH SUPPORT: GENOMIC AND EPIGENETIC PTSD PROTOCOLS CONTINUED.....



Sample ID	Well	Assay	ID	Internal Control [I]	Internal Control [C]	%Substrate conversion of control	Mean	Min	Max	SD	
Low Cont	A5	BDNF	08	L	150.12	6.32	4%	3%	3%	4%	0%
	A5	BDNF	10	L	192.94	9.38	3%	5%	3%	8%	2%
	A1	NR3C1	01	L	363.37	7.38	2%	4%	3%	6%	1%
	B5	NR3C1	05	L	220.15	1.55	3%	3%	1%	5%	2%
High Cont	A6	BDNF	08	H	181.44	6.38	3%	96%	95%	98%	1%
	A6	BDNF	10	H	138.57	11.60	0%	95%	90%	100%	4%
	A2	NR3C1	01	H	425.86	9.96	2%	92%	75%	98%	9%
	B9	NR3C1	05	H	219.80	5.29	5%	89%	79%	95%	7%
*140011	C6	NR3C1	09	H	140.63	1.36	2%	90%	77%	92%	9%
	A7	BDNF	08	11	230.08	6.08	3%	5%	4%	6%	1%
	A7	BDNF	10	11	201.04	6.03	3%	6%	4%	11%	3%
	A3	NR3C1	01	11	480.56	7.76	2%	4%	2%	6%	2%
*140011	B7	NR3C1	05	11	151.76	1.92	2%	3%	2%	6%	2%
	C7	NR3C1	09	11	214.07	1.09	1%	3%	2%	6%	2%

Example of Methylation study data provided by CRD to Principle Investigators

Epigenetic Testing. In support of Captain Michael R. Hossack’s protocol the Molecular Laboratory at the CRD is testing methylation status of 9 areas of the human genome for his hypothesis which states, “After controlling for combat exposure and adversity, methylation levels will distinguish soldiers with PTSD from those without. Early adversity will correlate with methylation status of the genes studied as well as PTSD presence and severity”.

Epigenetics is the study of biological mechanisms that will switch genes on and off. DNA methylation is one of the key epigenetic mechanisms that regulates genes. Even if two people have the exact same genes, if the DNA of the genes from one individual is methylated at a higher level, the expression of the genes from that individual is comparatively repressed. This difference in the expression of genes even in the context of identical genotypes may predispose an individual to developing a disease like PTSD. The CRD laboratory branch is utilizing Pyrosequencing technology for real-time, sequence-based detection and quantification of the epigenetic methylation status of 9 areas of the genome from subjects with PTSD as well as control subjects without PTSD. CRD laboratory branch staff validated 9 Pyrosequencing assays to assess the methylation levels of 7 genes linked to PTSD; 3 of the assays required designing by CRD staff and are proving to be relevant to Captain Hossack’s hypothesis.

Science and Technology Contact Information



Our Vision:

Grow Medical Leaders, Drive Innovations in Patient Centered Care and Readiness

Our Mission:

Conduct clinical studies and translational research and apply knowledge gained to enhance performance, protect the force, and advance medical care and capabilities

Points of Contact

**Chief Scientist's Office
Science and Technology
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Wilford Hall Ambulatory Surgical Center
2200 Bergquist Dr, Ste 1
JBSA-Lackland TX 78236**

**Admin Support (292-2097)
Senior Program Analyst (292-3466)
Senior Scientist (292-3513)
Clinical Investigations/CRD (292-7068)
Area Code: 210; DSN: 554**

ST email: usaf.jbsa.59-mdw.mbx.59-mdw-st@mail.mil

Kx site: <https://kx.afms.mil/ki/kx8/59MDWScienceAndTechnology/Pages/home.aspx>

Public site: <http://www.59mdw.af.mil/Units/ChiefScientist-ST.aspx>

<http://www.59mdw.af.mil/News/ArticleDisplay/tabid/2553/Article/936338/science-technology-revolutionizing-tomorrows-military-medicine-today.aspx>

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