

Program Announcement

for the

Department of Defense

Defense Health Program

Congressionally Directed Medical Research Programs

Peer Reviewed Medical Research Program

Discovery Award

Funding Opportunity Number: W81XWH-15-PRMRP-DA

Catalog of Federal Domestic Assistance Number: 12.420

SUBMISSION AND REVIEW DATES AND TIMES

- **Pre-Application Deadline:** 5:00 p.m. Eastern time (ET), June 25, 2015
- **Application Submission Deadline:** 11:59 p.m. ET, July 9, 2015
- **End of Application Verification Period:** 5:00 p.m. ET, July 14, 2015
- **Peer Review:** September 2015
- **Programmatic Review:** November 2015

The CDMRP eReceipt System has been replaced with the electronic Biomedical Research Application Portal (eBRAP). Principal Investigators and organizational representatives should register in eBRAP as soon as possible. All pre-applications must be submitted through eBRAP. In addition, applications submitted through Grants.gov will now be available for viewing, modification, and verification in eBRAP prior to the end of the application verification period.

This Program Announcement/Funding Opportunity is one of two documents with instructions to prepare and submit an application for this funding opportunity. The second document, the General Application Instructions, is available for downloading from Grants.gov.

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I. FUNDING OPPORTUNITY DESCRIPTION

A. Program Description

Applications to the Fiscal Year 2015 (FY15) Peer Reviewed Medical Research Program (PRMRP) are being solicited for the Defense Health Agency, Research, Development, and Acquisition (DHA RDA) Directorate, by the U.S. Army Medical Research Acquisition Activity (USAMRAA). As directed by the Office of the Assistant Secretary of Defense for Health Affairs, the DHA RDA Directorate manages and executes the Defense Health Program (DHP) Research, Development, Test, and Evaluation (RDT&E) appropriation. The executing agent for this Program Announcement/Funding Opportunity is the Congressionally Directed Medical Research Programs (CDMRP). The PRMRP was initiated in fiscal year 1999 (FY99) to provide support for military health-related research of exceptional scientific merit. Appropriations for the PRMRP from FY99 through FY14 totaled \$844.5 million (M). The FY15 appropriation is \$247.5M.

The vision of the FY15 PRMRP is to improve the health and well-being of all military Service members, Veterans, and beneficiaries. The PRMRP challenges the scientific and clinical communities to address at least one of the FY15 Topic Areas with original ideas that foster new directions along the entire spectrum of research and clinical care. The program seeks applications in laboratory, clinical, behavioral, epidemiologic, and other areas of research to advance knowledge in disease etiology, improve prevention, detection, diagnosis, treatment, and quality of life for those affected by a relevant disease or condition, and to develop and validate clinical care or public health guidelines.

B. FY15 PRMRP Topic Areas

All applications for PRMRP funding must specifically address at least one of the Topic Areas as directed by Congress and must be directly relevant to the healthcare needs of military Service members, Veterans, and/or beneficiaries. If the proposed research does not specifically address at least one of the FY15 PRMRP Topic Areas, the Government will administratively withdraw the application. The Government reserves the right to reassign the application's Topic Area if submitted under an inappropriate Topic Area. The FY15 PRMRP Topic Areas are listed below.

- Acupuncture
- Acute Lung Injury
- Advanced Prosthetics
- Arthritis (other than osteoarthritis, post-traumatic osteoarthritis, and rheumatoid arthritis)
- Burn Pit Exposure
- Cardiovascular Health
- Chronic Migraine and Post-Traumatic Headache
- Congenital Heart Disease
- Dengue
- Diabetes
- DNA Vaccine Technology for Post-Exposure Prophylaxis
- Dystonia
- Focal Segmental Glomerulosclerosis
- Food Allergies
- Fragile X Syndrome
- Healthcare-Acquired Infection Reduction

- Hepatitis B
- Hereditary Angioedema
- Hydrocephalus
- Inflammatory Bowel Disease
- Integrative Medicine
- Interstitial Cystitis
- Lupus
- Malaria
- Metals Toxicology
- Mitochondrial Disease
- Nanomaterials for Bone Regeneration
- Osteoarthritis
- Pancreatitis
- Pathogen-Inactivated Dried Plasma
- Polycystic Kidney Disease
- Post-Traumatic Osteoarthritis
- Psychotropic Medications
- Pulmonary Fibrosis
- Respiratory Health (excludes lung cancer and mesothelioma)
- Rheumatoid Arthritis
- Scleroderma
- Sleep Disorders
- Tinnitus
- Vascular Malformations
- Women's Heart Disease

Applications addressing any of the above Topic Areas are of interest to the program. Gaps and priority research areas within each of the above FY15 PRMRP Topic Areas have been identified by the Department of Defense (DoD) and the Department of Veterans Affairs (VA). The list may be found in the [Appendix](#) of this document. Applicants are encouraged to read and consider these gaps and priority research areas before preparing their applications. The information provided is not exhaustive, and applicants are not restricted to submitting applications that address the identified gaps and priority research areas. Any aspect of research relevant to one or more of the FY15 PRMRP Topic Areas may be considered for funding. It is the responsibility of the applicant to articulate how the proposed research relates to at least one FY15 PRMRP Topic Area.

C. Award Information

The intent of the PRMRP Discovery Award is to support innovative, untested, high-risk/potentially high-reward research that will provide new insights, paradigms, technologies, or applications. Studies supported by this award are expected to lay the groundwork for future avenues of scientific investigation. ***The proposed research project should include a well-formulated, testable hypothesis*** based on a sound scientific rationale and study design.

The proposed research project should be novel and innovative. Innovative research may introduce a new paradigm, challenge existing paradigms, look at existing problems from new perspectives, or exhibit other highly creative qualities. Research that is an incremental advance upon published data is not considered innovative and is not consistent with the intent of this award mechanism.

Inclusion of preliminary data is strongly discouraged. The outcome of research supported by this award should be the generation of robust preliminary data that can be used as a foundation for future research projects to understand the mechanisms of initiation or progression and/or improving patient care for a disease or condition. ***The Discovery Award is not intended to support a logical progression of an already established research project or other types of ongoing work;*** therefore, inclusion of preliminary data other than serendipitous findings or in small amounts is not consistent with the exploratory nature of this award. The presentation of

substantial preliminary data suggests that the proposed research project would be more appropriately submitted to a different award mechanism.

Reviewers at both tiers of review will be blinded to the identity of the Principal Investigator (PI), collaborators, and their organizations. Applications that identify the PI, collaborators, or their organizations in certain components of the application (see [Section II.C., Full Application Submission Content](#), for details) will be rejected for noncompliance. A document describing common blinding mistakes to avoid can be found on the eBRAP “Funding Opportunities & Forms” web page (<https://ebrap.org/eBRAP/public/Program.htm>). Young/early career investigators are encouraged to apply.

Research involving human subjects and human anatomical substances is permitted; however, **this award may not be used to conduct clinical trials.** For information on how to distinguish clinical research from clinical trials, see the Human Subject Resource Document at <https://ebrap.org/eBRAP/public/Program> PIs seeking funding for a clinical trial should apply to the FY15 PRMRP Clinical Trial Award mechanism (W81XWH-15-PRMRP-CTA).

Military Relevance: Relevance to the healthcare needs of military Service members, Veterans, and beneficiaries is a key feature of this award. Applications are required to include an explanation of how the proposed project has military relevance. Examples include:

- Explanation of how the project addresses an aspect of the target disease/condition/technology that has direct relevance or is unique to military Service members, Veterans, or military beneficiaries
- Use of military or Veteran populations or datasets in the proposed research
- Description of how the knowledge, information, products, or technologies gained from the proposed research could be implemented in a dual-use capacity to address a military need that also benefits the civilian population

PIs are encouraged to integrate and/or align their research projects with DoD and/or VA research laboratories and programs. Collaboration with the DoD or VA is also encouraged; however, as the peer and programmatic reviewers will not have access to the identity of the PI, collaborators, and their organizations, collaboration cannot be taken into consideration for funding decisions.

While not a complete list, the following websites may be useful in identifying additional information about ongoing DoD and VA areas of research interest or potential opportunities for collaboration within the FY15 PRMRP Topic Areas:

Air Force Research Laboratory	http://www.wpafb.af.mil	Conditionally Directed Medical Research Programs
Armed Forces Radiobiology Research Institute	http://www.usuhs.edu/afri/	http://cdmrp.army.mil
Clinical and Rehabilitative Medicine Research Program	https://crmrp.amedd.army.mil	Defense Advanced Research Projects Agency
Combat Casualty Care Research Program	https://ccc.amedd.army.mil	http://www.darpa.mil/
		Defense Technical Information Center
		http://www.dtic.mil
		Military Infectious Diseases Research Program
		https://midrp.amedd.army.mil

Military Operational Medicine
Research Program

<https://momrp.amedd.army.mil>

Naval Health Research Center

<http://www.med.navy.mil/sites/nhrc>

Navy and Marine Corps Public Health Center

<http://www.nmcphc.med.navy.mil/>

Office of Naval Research

<http://www.med.navy.mil/>

Office of the Under Secretary of Defense for
Acquisition, Technology and Logistics

<http://www.acq.osd.mil/>

Uniformed Services University of the
Health Sciences

<http://www.usuhs.edu/research.html>

U.S. Army Medical Research

Acquisition Activity

<https://www.usamraa.army.mil/>

U.S. Army Medical Research and
Materiel Command

<https://mrmc.amedd.army.mil>

U.S. Army Research Laboratory

<http://www.arl.army.mil>

U.S. Department of Defense Blast Injury
Research Program

<https://blastinjuryresearch.amedd.army.mil/>

U.S. Department of Veterans Affairs, Office
of Research and Development

<http://www.research.va.gov>

U.S. Naval Research Laboratory

<http://www.nrl.navy.mil>

Walter Reed Army Institute of Research

<http://wrair-www.army.mil>

Research Involving Human Anatomical Substances, Human Subjects, or Human

Cadavers: All DoD-funded research involving new and ongoing research with human anatomical substances, human subjects, or human cadavers must be reviewed and approved by the U.S. Army Medical Research and Materiel Command (USAMRMC) Office of Research Protections (ORP), Human Research Protection Office (HRPO), in addition to the local Institutional Review Board (IRB) of record. Local IRB approval at the time of submission is *not* required. The HRPO is mandated to comply with specific laws and requirements governing all research involving human anatomical substances, human subjects, or human cadavers that is supported by the DoD. These laws and requirements will necessitate information in addition to that supplied to the IRB. *Allow a minimum of 2 to 3 months for HRPO regulatory review and approval processes.* Refer to the General Application Instructions, Appendix 5, and the Human Subject Resource Document available on the eBRAP “Funding Opportunities & Forms” web page (<https://ebrap.org/eBRAP/public/Program.htm>) for additional information.

Guidelines for Animal Research: All projects should adhere to a core set of standards for rigorous study design and reporting to maximize the reproducibility and translational potential of preclinical research. The standards are described in Landis, S.C., et al. A call for transparent reporting to optimize the predictive value of preclinical research. *Nature* 2012, 490:187-191 (www.nature.com/nature/journal/v490/n7419/full/nature11556.html). While these standards are written for preclinical studies, the basic principles of randomization, blinding, sample-size estimation, and data handling derive from well-established best practices in clinical studies. Applicants should consult the ARRIVE (Animal Research: Reporting *In Vivo* Experiments) guidelines to ensure relevant aspects of rigorous animal research are adequately planned for and, ultimately, reported. The ARRIVE guidelines can be found at <http://www.nc3rs.org.uk/page.asp?id=1357>.

All DoD-funded research involving new and ongoing research with animals must be reviewed and approved by the USAMRMC ORP Animal Care and Use Review Office (ACURO), in addition to the local Institutional Animal Care and Use Committee (IACUC) of record. IACUC approval at the time of submission is not required. Specific documents relating to the use of

animals in the proposed research will be requested if the application is selected for funding. The ACURO must review and approve all animal use prior to the start of working with animals. PIs must submit the institutional animal use protocol, IACUC approval of that protocol, and a version of the animal use appendix titled “Research Involving Animals.” ***Allow at least 3 to 4 months for regulatory review and approval processes for animal studies.*** Refer to General Application Instructions, Appendix 5, for additional information.

The CDMRP intends that information, data, and research resources generated under awards funded by this Program Announcement/Funding Opportunity be made available to the research community (which includes both scientific and consumer advocacy communities) and to the public at large. For additional guidance, refer to the General Application Instructions, Appendix 3, Section L.

D. Eligibility Information

- Investigators at all levels are eligible to submit applications.
- Cost sharing/matching is not an eligibility requirement.
- Eligible investigators must apply through an organization. Organizations eligible to apply include national, international, for-profit, nonprofit, public, and private organizations. Both intramural (i.e., U.S. Federal Government agency, department, laboratory, medical treatment facility, or a U.S. Government activity embedded within a civilian medical center) and extramural investigators are encouraged to apply to this Program Announcement/Funding Opportunity.
- Refer to the General Application Instructions, Appendix 1, for general eligibility information.

E. Funding

- The maximum period of performance is **18** months.
- The anticipated direct costs budgeted for the entire period of performance will not exceed **\$200,000**. Associated indirect costs can be budgeted in accordance with the organization’s negotiated rate. No budget will be approved by the Government exceeding **\$200,000** direct costs or using an indirect rate exceeding the organization’s negotiated rate.
- All direct and indirect costs of any subaward (subgrant or subcontract) must be included in the total direct costs of the primary award.
- The applicant may request the entire maximum funding amount for a project that may have a period of performance less than the maximum **18** months.

Refer to the General Application Instructions, Section II.C.5., for budget regulations and instructions for the Research & Related Budget. ***For all Federal agencies or organizations collaborating with Federal agencies, budget restrictions apply as are noted in Section II.C.5. of the General Application Instructions.***

For this award mechanism, direct costs must be requested for:

- Travel costs for the PI to disseminate project results at one DoD to be specified by the CDMRP during the award performance period. These travel costs are in addition to those allowed for annual scientific/technical meetings.

May be requested for (not all-inclusive):

- Salary
- Research supplies
- Equipment
- Clinical research costs (clinical trials not allowed)
- Support for multidisciplinary collaborations
- Travel between collaborating organizations
- Travel costs to attend scientific/technical meetings in addition to the required meeting described above

Shall not be requested for:

- Tuition

Intramural (DoD), other Federal agency, and extramural investigators are encouraged to apply to this Program Announcement/Funding Opportunity. An intramural investigator is defined as a DoD military or civilian employee working within a DoD laboratory or medical treatment facility, or working in a DoD activity embedded within a civilian medical center. Intramural applicants and collaborators are reminded to coordinate receipt and commitment of funds through their respective resource managers. It is permissible for an intramural investigator to be named as a collaborator on an application submitted by an extramural investigator. ***In such cases, the extramural investigator must include a letter from the intramural collaborator's Commander or Commanding Officer that authorizes the involvement of the intramural collaborator.***

As required of all applicants to this Program Announcement/Funding Opportunity, if PIs from Federal agencies submit applications, they must submit through Grants.gov. Therefore, Federal applicants must be familiar with Grants.gov requirements, including the need for an active System for Award Management (SAM) registration and a Data Universal Numbering System (DUNS) number. Refer to Section II.A. of the General Application Instructions for further information regarding Grants.gov requirements.

Awards to extramural organizations will consist solely of assistance agreements (Cooperative Agreements and Grants). Awards to intramural agencies and other Federal agencies may be executed through a direct fund transfer (e.g., the Military Interdepartmental Purchase Request [MIPR] or Funding Authorization Document [FAD] process). Direct transfer of funds from the recipient to a Federal agency is not allowed except under very limited circumstances. Refer to the General Application Instructions, Section II.C.5. Research & Related Budget, for additional information on budget considerations for applications involving Federal agencies.

The CDMRP expects to allot approximately \$12.6M of the \$247.5M FY15 PRMRP appropriation to fund approximately 42 Discovery Award applications, depending on the

quality and number of applications received. Funding of applications received in response to this Program Announcement/Funding Opportunity is contingent upon the availability of Federal funds for this program.

II. SUBMISSION INFORMATION

Submission of applications that are essentially identical or propose essentially the same research project to different funding opportunities within the same program and fiscal year is prohibited and will result in administrative withdrawal of the duplicative application. As an exception, applicants may submit the research project described in their Discovery Award application as part of an application to the FY15 PRMRP Focused Program Award (W81XWH-15-PRMRP-FPA); however, accepting multiple awards to support the same project will not be allowed.

Submission is a two-step process requiring both (1) pre-application submission through the electronic Biomedical Research Application Portal (eBRAP) (<https://eBRAP.org/>) and (2) application submission through Grants.gov (<http://www.grants.gov/>). Refer to the General Application Instructions, Section II.A. for registration and submission requirements for eBRAP and Grants.gov.

eBRAP is a multifunctional web-based system that allows PIs to submit their pre-applications electronically through a secure connection, to view and edit the content of their pre-applications and full applications, to receive communications from the CDMRP, and to submit documentation during award negotiations and period of performance. A key feature of eBRAP is the ability of an organization's representatives and PIs to view and modify the Grants.gov application submissions associated with them. eBRAP will validate Grants.gov application files against the specific Program Announcement/Funding Opportunity requirements and discrepancies will be noted in an email to the PI and in the Full Application Files tab in eBRAP. It is the applicant's responsibility to review all application components for accuracy as well as ensure proper ordering as specified in this Program Announcement/Funding Opportunity.

PIs should ensure that their name and email address are the same as the name and email address that will be provided on the SF-424 Form of the Grants.gov application package submitted to Grants.gov. The organization, Business Officials, PI(s), and eBRAP log number named in the full application submitted to Grants.gov must match those named in the pre-application in eBRAP. ***Application viewing, modification, and verification in eBRAP is strongly recommended, but not required. The Project Narrative and Budget cannot be changed after the application submission deadline. Any other application component cannot be changed after the end of the application verification period.***

A. Where to Obtain the Grants.gov Application Package

To obtain the Grants.gov application package, including all required forms, perform a basic search using the Funding Opportunity Number W81XWH-15-PRMRP-DA in Grants.gov (<http://www.grants.gov/>).

B. Pre-Application Submission Content

All pre-application components must be submitted by the PI through eBRAP (<https://eBRAP.org/>).

PIs and organizations identified in the pre-application should be the same as those intended for the subsequent application submission. If any changes are necessary after submission of the pre-application, the PI must contact the CDMRP Help Desk at help@eBRAP.org or 301-682-5507.

The pre-application consists of the following components, which are organized in eBRAP by separate tabs (refer to the General Application Instructions, Section II.B., for additional information on pre-application submission):

- **Application Information – Tab 1**
- **Application Contacts – Tab 2**
 - Enter contact information for the PI. Enter the organization’s Business Official responsible for sponsored program administration (the “person to be contacted on matters involving this application” in Block 5 of the Grants.gov SF-424 Form). The Business Official must either be selected from the eBRAP list or invited in order for the pre-application to be submitted.
 - It is recommended that PIs identify an Alternate Submitter in the event that assistance with pre-application submission is needed.
- **Collaborators and Key Personnel – Tab 3**
 - Enter the name, organization, and role of all collaborators and key personnel associated with the application.
 - FY15 PRMRP Joint Programmatic Review Panel (JPRP) members should not be involved in any pre-application or application. For questions related to JPRP members and pre-applications or applications, refer to [Section IV.C., Withdrawal](#), or contact the CDMRP Help Desk at help@eBRAP.org or 301-682-5507.
- **Conflicts of Interest (COIs) – Tab 4**
 - List all individuals other than collaborators and key personnel who may have a COI in the review of the application (including those with whom the PI has a personal or professional relationship).
- **Pre-Application Files – Tab 5**
 - **Letter of Intent (LOI) (one-page limit):** Provide a brief description of the research to be conducted. Include the FY15 PRMRP Topic Area(s) under which the application will be submitted. LOIs are used for program planning purposes only (e.g., reviewer recruitment) and will not be reviewed during either the peer or programmatic review sessions.
- **Submit Pre-Application – Tab 6**
 - This tab must be completed for the pre-application to be accepted and processed.

C. Full Application Submission Content

The CDMRP cannot make allowances/exceptions to its policies for submission problems encountered by the applicant organization using system-to-system interfaces with Grants.gov.

Each application submission must include the completed Grants.gov application package provided in Grants.gov for this Program Announcement/Funding Opportunity. The Grants.gov

application package is submitted by the Authorized Organizational Representative through the Grants.gov portal (<http://www.grants.gov/>).

Note: The Project Narrative and Budget Form cannot be changed after the application submission deadline. If either the Project Narrative or the budget fails eBRAP validation or if the Project Narrative or Budget Form needs to be modified, an updated Grants.gov application package must be submitted via Grants.gov as a “Changed/Corrected Application” with the previous Grants.gov Tracking ID *prior to the application submission deadline*.

Reviewers will be blinded to the identity of the PI, collaborators, and their organization(s). Due to the blinded nature of the review process, identifying or making references to the PI(s), collaborator(s), or their organization(s) in the Project Narrative, Supporting Documentation, Technical and Public Abstracts, Military Relevance Statement, and Impact Statement is prohibited and will result in administrative rejection of the application. In addition, the use of “I,” “we,” “our,” “this organization,” or similar phrases that refer to the PI(s), collaborator(s), or their organization(s) through the references listed, or the use of formatting (e.g., bolding, underlining, names in headers/footers), inclusion of citations to unpublished manuscripts, inclusion of URLs, or in any other way highlighting the names of the PI(s), collaborator(s), or their institution(s), is prohibited and will result in administrative rejection of the application and preclude invitation to submit a full application.

Although required, the Statement of Work, Research & Related Budget, R & R Subaward Budget Attachment(s) Form (if applicable), Letters of Support, Collaborating Military DoD Facility Support Form (if applicable), biographical sketch, previous/current/pending support, and Project/Performance Site Location(s) Form will not be forwarded for peer review or programmatic review. These documents will be used for administrative purposes only.

Grants.gov application package components: For the Discovery Award, the Grants.gov application package includes the following components (refer to the General Application Instructions, Section II.C., for additional information on application submission):

- 1. SF-424 (R&R) Application for Federal Assistance Form:** Refer to the General Application Instructions, Section II.C., for detailed information.
- 2. Attachments Form**

Each attachment to the Grants.gov application forms must be uploaded as an individual PDF file in accordance with the formatting guidelines listed in Appendix 2 of the General Application Instructions. For all attachments, ensure that the file names are consistent with the guidance. Grants.gov will reject attachments with file names longer than 50 characters or incorrect file names that contain characters other than the following: A-Z, a-z, 0-9, underscore, hyphen, space, and period. In addition, Grants.gov has file size limits that may apply in some circumstances. Individual attachments may not exceed 20 MB and the file size for the entire Grants.gov application package may not exceed 200 MB.

- **Attachment 1: Project Narrative (five-page limit): Upload as “ProjectNarrative.pdf.”** The page limit of the Project Narrative applies to text and non-text elements (e.g., figures, tables, graphs, photographs, diagrams, chemical structures, drawings, etc.) used to describe the project. Inclusion of URLs that provide additional information to expand the Project Narrative and could confer

an unfair competitive advantage is prohibited and may result in administrative withdrawal of the application.

Describe the proposed project in detail using the outline below. ***Do not include names, URLs, or other information such as use of the terms “I,” “we,” “our,” “this organization,” or similar phrases that identify the PI, collaborator(s), or their organization(s).***

- **Background:** Present the ideas and reasoning behind the proposed work. Cite relevant literature. Inclusion of preliminary data is strongly discouraged.
- **Hypothesis:** State the hypothesis to be tested.
- **Specific Aims:** Concisely explain the project’s specific aims and the objectives to be reached. If the proposed work is part of a larger study, present only aims that the DoD award would fund.
- **Research Strategy:** Describe the experimental design, methods, and analyses, including appropriate controls, in sufficient detail for scientific evaluation. Describe the statistical and other data analyses to be used to justify the number of research subjects (animal or human) and assess the collected data. Address potential problem areas and present alternative methods and approaches. If animal studies are proposed, describe how they will be conducted in accordance with the ARRIVE guidelines (<http://www.nc3rs.org.uk/page.asp?id=1357>). If human subjects or human anatomical substances will be used, describe the study population and include a detailed plan for the recruitment of subjects or the acquisition of samples. ***Clinical trials are not allowed under the Discovery Award mechanism.***
- **Innovation:** Describe how the proposed research is novel and innovative, including how it will provide new insights, paradigms, technologies, or applications to the research field and/or patient care. Investigating the next logical step of an existing line of research or providing an incremental advance on published data is not considered innovative.
- **Attachment 2: Supporting Documentation.** Start each document on a new page. Combine and upload as a single file named “Support.pdf.” If documents are scanned to pdf, the lowest resolution (100 to 150 dpi) should be used. ***There are no page limits for any of these components unless otherwise noted. Include only those components described below; inclusion of items not requested will result in the removal of those items or may result in administrative withdrawal of the application.***
 - **References Cited (10-citation limit):** List the references cited (including URLs if available) in the Project Narrative using a standard reference format that includes the full citation (i.e., author[s], year published, title of reference, source of reference, volume, chapter, page numbers, and publisher, as appropriate). ***Do not include URLs that identify the PI(s), collaborator(s), or the organization(s) of the PI(s) or collaborator(s).***
 - **List of Abbreviations, Acronyms, and Symbols:** Provide a list of abbreviations, acronyms, and symbols.

- **Attachment 3: Technical Abstract (one-page limit):** Upload as “TechAbs.pdf.” Use only characters available on a standard QWERTY keyboard. Spell out all Greek letters, other non-English letters, and symbols. Graphics are not allowed.

The technical abstract is used by all reviewers as a description of the project’s key aspects. Therefore, clarity and completeness within the space limits of the technical abstract are highly important. Describe the proposed research project including the following elements:

State the FY15 PRMRP Topic Area(s) addressed by the proposed research project. Clearly describe the proposed research including the rationale, the hypothesis to be tested, the innovative aspects of the research, the study design, the expected results, and how the results will be used as a foundation for future research projects. ***Do not include information that identifies the PI, collaborator(s), or their organization(s).***

- **Attachment 4: Lay Abstract (one-page limit):** Upload as “LayAbs.pdf.” Use only characters available on a standard QWERTY keyboard. Spell out all Greek letters, other non-English letters, and symbols. Graphics are not allowed.

State the FY15 PRMRP Topic Area(s) addressed by the proposed research project. Include an overview of the proposed research project that will be ***readily understood by readers without a background in science or medicine.*** Clearly describe the central critical problem or question to be addressed, the innovation of the idea, and the ultimate applicability and impact of the research. ***Do not duplicate the technical abstract. Do not include information that identifies the PI, collaborator(s), or their organization(s).***

- **Attachment 5: Statement of Work (SOW) (three-page limit):** Upload as “SOW.pdf.” The suggested SOW format and examples specific to different types of research projects are available on the eBRAP “Funding Opportunities & Forms” web page (<https://ebrap.org/eBRAP/public/Program.htm>). For the Discovery Award mechanism, use the SOW format example titled “SOW (Statement of Work) Generic Format.” The SOW must be in PDF format prior to attaching. Refer to the General Application Instructions, Section II.C.3., for detailed guidance on creating the SOW.

- **Attachment 6: Impact Statement (one-page limit):** Upload as “Impact.pdf.”

Explain why the proposed research project is important and relevant to understanding the cause or progression of the disease or condition, and/or to developing improvements in prevention, detection, diagnosis, treatment, or quality of life in the FY15 PRMRP Topic Area(s) addressed. Describe how the study will address a central critical problem or question in the relevant Topic Area(s). State the expected results from the proposed research and how they will be used as a foundation for future research projects. Outline the potential short-term or long-term impact of the proposed research on the field.

Do not include information that identifies the PI, collaborator(s), or their organization(s).

- **Attachment 7: Military Relevance Statement (one-page limit): Upload as “MilRel.pdf.”**

Describe how the proposed study is responsive to the healthcare needs of military Service members, Veterans, and/or beneficiaries. Provide information about the incidence and/or prevalence of the disease or condition to be studied in military Service members, Veterans, and/or beneficiaries.

If active duty military, military families, and/or Veteran population(s) or dataset(s) will be used in the proposed research project, describe the population(s)/dataset(s), the appropriateness of the population(s)/dataset(s) for the proposed study, and the feasibility of accessing the population(s)/dataset(s). If a non-military population will be used for the proposed research project, explain how the population simulates the targeted population (i.e., military Service members, Veterans, and/or beneficiaries).

If applicable, show how the proposed research project aligns with DoD and/or VA areas of research interest and/or patient care. Provide a description of how the knowledge, information, products, or technologies gained from the research could be implemented in a dual-use capacity to address a military need that also benefits the civilian population, as appropriate. ***Do not include information that identifies the PI, collaborator(s), or their organization(s).***

- **Attachment 8: Letters of Support:** Start each document on a new page. Combine and upload as “Letters.pdf.” A two-page limit per letter is recommended. Letters will not be forwarded for peer or programmatic review.
 - Letters of Organizational Support: Provide a letter (or letters, if applicable), signed by the Department Chair or appropriate organization official, confirming the laboratory space, equipment, and other resources available for the project. The letter should reflect the availability of laboratory space, equipment, and other resources available for the project.
 - Letters of Collaboration (if applicable): Provide a signed letter from each collaborating individual or organization that will demonstrate that the PI has the support or resources necessary for the proposed work.
- **Attachment 9: Collaborating DoD Military Facility Budget Form(s), if applicable: Upload as “MFBudget.pdf.”** If a Military Facility (military health system facility, research laboratory, treatment facility, dental treatment facility, or a DoD activity embedded with a civilian medical center) will be a collaborator in performance of the project, complete the Collaborating DoD Military Facility Budget Form (available for download on the eBRAP “Funding Opportunities & Forms” web page), including a budget justification, for each Military Facility as instructed. Refer to the General Application Instructions, Section II.C.8., for detailed information.

3. Research & Related Senior/Key Person Profile (Expanded): Refer to the General Application Instructions, Section II.C.4., for detailed information.

- PI Biographical Sketch (five-page limit): Upload as “Biosketch_LastName.pdf.” The suggested biographical sketch format is available on the “Funding Opportunities & Forms” web page (<https://ebrap.org/eBRAP/public/Program.htm>)

in eBRAP. The five-page National Institutes of Health Biographical Sketch may also be used.

- PI Previous/Current/Pending Support (no page limit): Upload as “Support_LastName.pdf.”
- Key Personnel Biographical Sketches (five-page limit each): Upload as “Biosketch_LastName.pdf.”
- Key Personnel Previous/Current/Pending Support (no page limit): Upload as “Support_LastName.pdf.”

4. Research & Related Budget: Refer to the General Application Instructions, Section II.C.5., for detailed information.

- Budget Justification (no page limit): Upload as “BudgetJustification.pdf.” The budget justification for the entire period of performance must be uploaded to the Research & Related Budget after completion of the budget for Period 1.

5. Project/Performance Site Location(s) Form: Refer to the General Application Instructions, Section II.C.6., for detailed information.

6. R & R Subaward Budget Attachment(s) Form (if applicable): Refer to the General Application Instructions, Section II.C.7., for detailed information.

D. Applicant Verification of Grants.gov Submission in eBRAP

Prior to the end of the application verification period, PIs and organizational representatives can review and modify in eBRAP certain components of an application submitted to Grants.gov. Following retrieval and processing of the Grants.gov application, eBRAP will notify the organizational representatives and PI by email to log into eBRAP to review, modify, and verify the Grants.gov application submission. eBRAP will validate retrieved files against the specific Program Announcement/Funding Opportunity requirements and discrepancies will be noted in both the email and in the Full Application Files tab in eBRAP. eBRAP does not confirm the accuracy of file content. It is the applicant’s responsibility to review all application components and ensure proper ordering as specified in the Program Announcement/Funding Opportunity. *If either the Project Narrative or the budget fails eBRAP validation, an updated Grants.gov application package must be submitted via Grants.gov as a “Changed/Corrected Application” with the previous Grants.gov Tracking ID prior to the application submission deadline.* The Project Narrative and Budget Form cannot be changed after the application submission deadline.

E. Submission Dates and Times

All submission dates and times are indicated on the [title page](#) of this Program Announcement/Funding Opportunity. Pre-application and application submissions are required. Failure to meet either of these deadlines will result in application rejection.

F. Other Submission Requirements

Refer to the General Application Instructions, Appendix 2, for detailed formatting guidelines.

All applications must be submitted through Grants.gov. Applicant organizations and all subrecipient organizations must have a DUNS number to submit applications to Grants.gov. The

applicant organization must also be registered in the Entity Management functional area of the SAM with an “Active” status to submit applications through the Grants.gov portal. Refer to the General Application Instructions, Section II.A., for information on Grants.gov registration requirements.

III. APPLICATION REVIEW INFORMATION

A. Application Review and Selection Process

All applicants are evaluated by scientists, clinicians, and consumer advocates using a two-tier review process. The first tier is peer review of applications against established criteria for determining technical merit. The second tier is a programmatic review that makes recommendations for funding to the DHA RDA Directorate and the Office of the Assistant Secretary of Defense for Health Affairs, based on (a) technical merit and (b) the relevance to the mission of the DHP and PRMRP, and to the specific intent of the award mechanism. The highest-scoring applications from the first tier of review are not automatically recommended for funding. Additional information about the two-tier process used by the CDMRP can be found at <http://cdmrp.army.mil/about/fundingprocess>. *For this Program Announcement/Funding Opportunity, reviewers at both tiers of review will be blinded to the identity of the PI(s), collaborator(s), and their organization(s).*

All CDMRP review processes are conducted confidentially to maintain the integrity of the merit-based selection process. Panel members sign a nondisclosure statement that application and evaluation information will not be disclosed outside the panel. Violations of confidentiality can result in the dissolving of a panel(s) and other corrective actions. In addition, personnel at the applicant or collaborating organizations are prohibited from contacting persons involved in the review process to gain protected evaluation information or to influence the evaluation process. Violations of these prohibitions will result in the administrative withdrawal of the organization’s application. Violations by panel members or applicants that compromise the confidentiality of the review process may also result in suspension or debarment from Federal awards. Furthermore, the unauthorized disclosure of confidential information of one party to another third party is a crime in accordance with Title 18 United States Code 1905.

B. Application Review Process

- 1. Peer Review:** To determine technical merit, all applications will be evaluated according to the following scored criteria, which are of equal importance:
 - **Research Strategy and Feasibility**
 - How well the scientific rationale supports the proposed research project and its feasibility.
 - To what degree the hypothesis proposed is clearly defined and testable.
 - To what extent the specific aims, experimental design, methods, and analyses are appropriate to test the hypothesis.
 - Whether the proposed research project can be completed within an 18-month performance period.
 - How well potential problems and alternative approaches are addressed.

- If applicable, to what degree the statistical plan and power analysis are appropriate for the proposed project.
- If animal studies are included, how well they are designed to achieve reproducible and rigorous results, including the choice of model and the endpoints/outcomes to be measured.
- **Innovation**
 - To what extent the proposed research will provide new insights, paradigms, technologies, or applications with the potential to impact the research field and/or patient care.
 - To what extent the proposed research represents more than an incremental advance upon published data or more than the next logical step in a research project.
- **Impact/Relevance**
 - To what extent the proposed research project impacts an important scientific question relevant to at least one of the FY15 PRMRP Topic Areas.
 - To what extent the research has the potential to generate robust preliminary data that can be used as a foundation for future research projects.
 - To what degree the proposed research project is important and relevant to understanding the cause or progression of the disease or condition, and/or to developing improvements in prevention, detection, diagnosis, treatment, or quality of life.
 - To what extent the proposed research has potential for long-term or short-term impact on the field.

In addition, the following unscored criteria will also contribute to the overall evaluation of the application:

- **Application Presentation**
 - To what extent the writing, clarity, and presentation of the application components influence the review.

2. Programmatic Review: To make funding recommendations and select the application(s) that, individually or collectively, will best achieve the program objectives, the following criteria are used by programmatic reviewers:

- a. Ratings and evaluations of the peer reviewers**
- b. Relevance to the mission of the DHP and FY15 PRMRP, as evidenced by the following:**
 - Adherence to the intent of the award mechanism
 - Military relevance
 - Program portfolio composition
 - Relative innovation
 - Relevance to program objectives

C. Recipient Qualification

For general information on required qualifications for award recipients, refer to the General Application Instructions, Appendix 1.

D. Application Review Dates

All application review dates and times are indicated on the [title page](#) of this Program Announcement/Funding Opportunity.

E. Notification of Application Review Results

Each PI and organization will receive email notification of posting of the funding recommendation in eBRAP. Each PI will receive a peer review summary statement on the strengths and weaknesses of the application.

IV. ADMINISTRATIVE ACTIONS

After receipt of applications from Grants.gov, the following administrative actions may occur:

A. Rejection

The following will result in administrative rejection of the application:

- Pre-application was not submitted.
- Project Narrative exceeds page limit.
- Project Narrative is missing.
- Budget is missing.
- Submission of the same research project to different funding opportunities within the same program and fiscal year. Refer to [Section II, Submission Information](#), for exceptions.
- The PI(s), collaborator(s), or their organization(s) are identified or referenced in the Project Narrative, Supporting Documentation, Technical and Public Abstracts, Impact Statement, and Military Relevance Statement.
- Use of “I,” “we,” “our,” “this organization,” or similar phrases that refer to the PI(s), collaborator(s), or their organization(s) through the references listed, or the use of formatting (e.g., bolding, underlining, names in headers/footers), inclusion of citations to unpublished manuscripts, or in any other way highlighting (and therefore revealing) the names of the PI(s), collaborator(s), or their institution(s).

B. Modification

- Pages exceeding the specific limits will be removed prior to review for all documents other than the Project Narrative.
- Documents not requested will be removed.

C. Withdrawal

The following may result in administrative withdrawal of the application:

- A FY15 PRMRP JPRP member is named as being involved in the research proposed or is found to have assisted in the pre-application or application processes including, but not limited to, concept design, application development, budget preparation, and the development of any supporting documentation. A list of the FY15 PRMRP JPRP members can be found at <http://cdmrp.army.mil/prmrp/panels/panels15>.
- The application fails to conform to this Program Announcement/Funding Opportunity description to the extent that appropriate review cannot be conducted.
- Inclusion of URLs, with the exception of links in References Cited and Publication and/or Patent Abstract sections.
- Page size is larger than 8.5 inches x 11.0 inches (approximately 21.59 cm x 27.94 cm).
- Inclusion of any employee of CDMRP review contractors in applications for funding without adequate plans to mitigate conflicts of interest. Refer to the General Application Instructions, Section II.B., for detailed information.
- Personnel from applicant or collaborating organizations are found to have contacted persons involved in the review process to gain protected evaluation information or to influence the evaluation process.
- The proposed research project is not relevant to any of the Congressionally directed FY15 PRMRP Topic Areas.
- If a clinical trial is proposed, the application will be withdrawn.

D. Withhold

Applications that appear to involve research misconduct will be administratively withheld from further consideration pending institutional investigation. The institution will be required to provide the findings of the investigation to the USAMRAA Grants Officer for a determination of the final disposition of the application.

V. AWARD ADMINISTRATION INFORMATION

A. Award Notice

Awards will be made no later than September 30, 2016. Refer to the General Application Instructions, Appendix 3, for additional award administration information.

Any assistance instrument awarded under this Program Announcement/Funding Opportunity will be governed by the award terms and conditions, which conform to DoD's implementation of the Office of Management and Budget (OMB) circulars applicable to financial assistance. Terms and conditions of new awards made after December 26, 2014 may include revisions to reflect DoD implementation of new OMB guidance in the Code of Federal Regulations, Title 2, Part 200, "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards" (2 CFR part 200).

B. Administrative Requirements

Refer to the General Application Instructions, Appendix 3 for general information regarding administrative requirements.

C. National Policy Requirements

Refer to the General Application Instructions, Appendix 4 for general information regarding national policy requirements.

D. Reporting

Refer to the General Application Instructions, Appendix 3, Section J, for general information on reporting requirements.

Quarterly technical progress reports with quad charts may be required.

E. Award Transfers

Refer to the General Application Instructions, Appendix 3, Section N, for general information on organization or PI changes.

VI. AGENCY CONTACTS

A. CDMRP Help Desk

Questions related to Program Announcement/Funding Opportunity content or submission requirements as well as questions related to the submission of the pre-application through eBRAP should be directed to the CDMRP Help Desk, which is available Monday through Friday from 8:00 a.m. to 5:00 p.m. ET. Response times may vary depending upon the volume of inquiries.

Phone: 301-682-5507

Email: help@eBRAP.org

B. Grants.gov Contact Center

Questions related to application submission through Grants.gov portal should be directed to the Grants.gov Contact Center, which is available 24 hours a day, 7 days a week (closed on U.S. Federal holidays). Note that the CDMRP Help Desk is unable to provide technical assistance with Grants.gov submission.

Phone: 800-518-4726

Email: support@grants.gov

Sign up on Grants.gov for “send me change notification emails” by following the link on the Synopsis page for the Program Announcement/Funding Opportunity or by responding to the prompt provided by Grants.gov when first downloading the Grants.gov application package. If the Grants.gov application package is updated or changed, the original version of the application package may not be accepted by Grants.gov.

VII. APPLICATION SUBMISSION CHECKLIST

Grants.gov Application Components	Upload Order	Action	Completed
SF-424 (R&R) Application for Federal Assistance		Complete form as instructed.	
Attachments Form	1	Project Narrative: Upload as Attachment 1 with file name "ProjectNarrative.pdf."	
	2	Supporting Documentation: Upload as Attachment 2 with file name "Support.pdf."	
	3	Technical Abstract: Upload as Attachment 3 with file name "TechAbs.pdf."	
	4	Lay Abstract: Upload as Attachment 4 with file name "LayAbs.pdf."	
	5	Statement of Work: Upload as Attachment 5 with file name "SOW.pdf."	
	6	Impact Statement: Upload as Attachment 6 with file name "Impact.pdf."	
	7	Military Relevance Statement: Upload as Attachment 7 with file name "MilRel.pdf."	
	8	Letters of Support: Upload as Attachment 8 with file name "Letters.pdf."	
	9	Collaborating DoD Military Facility Budget Form(s): Upload Attachment 9 with file name "MFBudget.pdf," if applicable.	
Research & Related Senior/Key Person Profile (Expanded)		Attach PI Biographical Sketch (Biosketch_LastName.pdf) to the appropriate field.	
		Attach PI Previous/Current/Pending Support (Support_LastName.pdf) to the appropriate field.	
		Attach Biographical Sketch (Biosketch_LastName.pdf) for each senior/key person to the appropriate field.	
		Attach Previous/Current/Pending (Support_LastName.pdf) for each senior/key person to the appropriate field.	
Research & Related Budget		Complete as instructed. Attach Budget Justification (BudgetJustification.pdf) to the appropriate field.	
Project/Performance Site Location(s) Form		Complete form as instructed.	
R & R Subaward Budget Attachment(s) Form		Complete form as instructed.	

APPENDIX GAPS AND PRIORITY RESEARCH AREAS

Applications addressing any of the Fiscal Year 2015 (FY15) Peer Reviewed Medical Research Programs (PRMRP) Topic Areas are of interest to the program. Gaps and priority research areas related to the FY15 PRMRP Topic Areas have been identified by the Department of Defense (DoD) and the Department of Veterans Affairs and are listed below. Applicants are encouraged to read and consider these gaps and priority research areas before preparing their applications. The information provided is not exhaustive, and applicants are not restricted to submitting applications that address the identified gaps and priority research areas in this list. Any aspect of research relevant to one or more FY15 PRMRP Topic Area may be considered for funding.

Acupuncture

- Definitive studies to determine the effectiveness of acupuncture for acute and chronic pain associated with traumatic neuromusculoskeletal injuries, including the role of acupuncture in reducing pain medication use.
- Research on the role of acupuncture in pain management following traumatic brain injury, spinal cord injury, and/or peripheral nerve injury.
- Research on the use of acupuncture as prevention of or treatment for mental health disorders such as post-traumatic stress, depression, suicide and suicidal ideation, substance abuse, agitation, anxiety, and other co-morbid disorders.
- Research to contribute to clinical guidelines on use of acupuncture, including dose response, degree of rigor, how long it should be continued for specific conditions, and how to incorporate it into standard care.
- Research on the use of acupuncture in patient transport to manage pain.

Acute Lung Injury

- Cellular or other therapies to treat acute lung injury due to inhalation injury in the single and polytrauma patient.
- Preventive techniques and therapeutics to reduce the incidence of acute respiratory distress syndrome (ARDS) and/or lung injury secondary to severe trauma.
- Strategies for safe transport of patients with lung injury in order to optimize therapeutic interventions (sigh breaths, adjusting vent settings, etc.).
- Research to provide a better understanding of a patient's predisposition to outcomes of hemorrhagic shock related to immune-modulation or inflammatory response.
- Preventive techniques and therapeutics for patients that develop acute lung injury as a result of hemorrhagic shock and/or transfusion.
- Research on the etiology and prevention of ARDS caused by the immune system's responses to infectious disease.

Advanced Prosthetics

- Advancement of efferent control, i.e., control of multi-degree-of-freedom prostheses. This could include an upper extremity with fine motor movements, or a lower extremity to provide a biologically accurate gait.
- Development of device afferent communication, science of proprioception, and pressure sensing, and determining how to communicate this information to the user. The end goal of this research would be for the user to obtain natural feedback from a terminal device.
- Research on the development and use of prosthetics for urogenital injury.

Arthritis (other than osteoarthritis, rheumatoid arthritis, and post-traumatic osteoarthritis)

- Studies that define the risk of contracting septic arthritis, reactive arthritis, arthritis caused by a gastrointestinal, genitourinary, or viral infection (e.g., Lyme disease, Campylobacter, chikungunya), and other arthritis types in active duty military personnel.
- Research toward the development of clinical practice guidelines to prevent, identify, and treat arthritis, particularly as a result of traumatic injury, surgery, and/or infectious diseases.
- Research to establish activity recommendations for maximal joint life following joint repair, particularly in young patient populations.
- Repair of focal cartilage defects using cell-based therapies.

Burn Pit Exposure

- Research on the etiology and treatment of adverse health events related to military deployment to Iraq and Afghanistan associated with exposure to airborne hazards and open pit burning of solid waste and other materials.
- Toxicological studies to ascertain toxicity of natural dust, burn pit combustion products, interactions between pollutants, and mechanisms of action.
- Characterization of emissions from open air burns, burn boxes, and incinerators. This includes determining relative contributions of background anthropogenic and geogenic sources.
- Development and validation of exposure assessment instruments for use in research and clinical validation.

Cardiovascular Health

- Risk assessment, prevention, and treatment of trauma-induced cardiac arrest secondary to hemorrhage and polytrauma.
- Research to better understand the hypermetabolic state of combat casualties while at Level 5 military medical treatment facilities and beyond, including etiology, outcomes (e.g., left ventricular hypertrophy), and treatment.
- Research to understand the relationship between physical (e.g., traumatic brain injury) and psychological (e.g., post-traumatic stress disorder, depression, anxiety) disorders and cardiovascular disease.

- Research toward development of guidelines for the management of active duty patients with non-operative disease of the aortic valve and/or ascending aorta. With increased availability and use of CT (computed tomography) scans and echocardiography, the known incidence of aortic aneurysm and aortic valve disease in the active duty population is increasing, but current management is variable, non-standardized, and inconsistent.
- Research to assess the impact of the DoD Physical Fitness Tests in influencing reduction of cardiovascular risk from atherosclerosis.

Chronic Migraine and Post-Traumatic Headache

- Epidemiological/natural history studies to characterize specific types of post-traumatic headache, the pathobiology of these headaches (such as the role of cortical spreading depression acutely after injury as a risk factor for chronic headaches of a migrainous type), and risk factors that might predispose people to certain types of post-traumatic headache.
- Double-blind placebo-controlled trials in the post-traumatic headache population in order to determine whether similar phenotypes in primary headache disorders and post-traumatic headache will respond similarly to treatment.
- Research on the optimal approaches to effective management of co-occurring psychological health disorders and acute and chronic pain management for chronic migraine and post-traumatic headache, with a focus on assessing and eliminating adverse outcomes and decreasing polypharmacy.
- Research on the utility of the Patient-Centered Medical Home model of care of patients with chronic migraine or post-traumatic headache.
- Research to investigate, develop, and validate biomarkers useful in diagnosing and monitoring traumatic brain injury patients with chronic migraine or post-traumatic headache.

Congenital Heart Disease

- Research on the transition of care of congenital heart disease patients from pediatric to adult providers in the Military Health System.
- Research on the ability of patients with congenital heart disease to join or remain on active duty.

Dengue

- Research leading to a better understanding of the immune mechanisms involved in the clearance of dengue virus and mechanisms of immune enhancement that lead to more severe clinical disease.
- Evaluation of humoral and cellular immune responses after vaccination and natural infection.
- Development of a dengue vaccine.
- Development of a safe, effective dengue human challenge model for clinical trials.
- Development of field-based diagnostics to allow for rapid identification of dengue virus infection.

- Research toward understanding the potential influence of dietary intake as a potential repellent to mosquito vectors and vector behavior.
- Identification and reduction of the Dengue pathogen in blood products for transfusion.

Diabetes

- Development of an electronic patient-care medical home/neighborhood for diabetes care, to include components such as a comprehensive diabetes care flow chart in electronic medical records (EMR) with the ability for data to automatically flow, eliminating second entry; automated reminders for standard of care, the Healthcare Effectiveness Data and Information Set (HEDIS) and other National Committee for Quality Assurance (NCQA) measures; automated order entry with decision support algorithms; improvement of the current inpatient EMR glycemic management tools; standardization of order sets; reconfiguration of data flow for clinical usability.
- Research on the effectiveness of electronic patient care medical home/neighborhood technologies, such as improvement in HEDIS metrics, disease control and complications, order set utilization, rates of hospital hyper- and hypoglycemia, readmission rates, morbidity, and mortality.
- Research on the effectiveness, tolerability, safety, and accessibility of Food and Drug Administration-approved pharmacology for the treatment of obesity and prevention/improvement of obesity-related co-morbid diseases in military healthcare beneficiaries, including the active duty population.
- Optimization of the medical home care of patients with diabetes by utilizing non-mydriatic cameras for retinal exams, including DoD-wide studies with electronic data collection to examine the impact of diagnosing early diabetic eye disease, early intervention, and cost-saving strategies.
- Research to better understand the heterogeneity of diabetes.
- Development of biomarkers to identify and monitor at risk individuals and assess treatment response.

DNA Vaccine Technology for Post-Exposure Prophylaxis

- The design and manufacture of a cost-efficient DNA vaccine that is simple to manufacture, stable without the need for refrigeration or freezing, can be used in both immune-competent and immune-compromised individuals, and expresses a highly conserved, chimeric protein antigen displaying multiple antigenic domains of key virulence factors of enteric or viral pathogens.
- Development of innovative approaches to cure human immunodeficiency virus (HIV) using multiple therapeutic modalities in acute HIV infection. Additionally, there is a need to optimize antibody responses using novel adjuvants for HIV vaccine.
- Development of mechanisms or devices for mucosal delivery of a DNA vaccine for enteric or viral pathogens. This includes research to understand and improve the mechanisms to stimulate immune responses with a cost-efficient DNA vaccine for enteric or viral pathogens that is simple to manufacture and stable without the need for refrigeration or freezing.

- Research leading to a better understanding of the immune mechanisms involved in the clearance of enteric pathogens that would most likely be stimulated by a DNA vaccine. There is a need to evaluate humoral immune responses after DNA vaccination and to determine immunological correlates of protection, including both antibodies and cellular immune mechanisms in reproducible small animal models.
- Development of safe and effective DNA vaccines against hantavirus.

Dystonia

- Research to improve identification of delayed onset dystonia following traumatic brain injury.
- Development of treatments to prevent or slow the progression of, or alleviate the symptoms of, dystonia associated with traumatic brain injury.
- Research on the risk, incidence, etiology, prevention, and treatment of embouchure dystonia in military band woodwind and brass players.

Focal Segmental Glomerulosclerosis

- Development of non-invasive methods to diagnosis focal segmental glomerulosclerosis and its variants.
- Research on the long-term use of immunosuppressants in patients with focal segmental glomerulosclerosis and the likelihood of developing infections.
- Research to improve understanding of the causes of primary and secondary focal segmental glomerulosclerosis.
- Development of a curative therapy or treatments to better halt the progression of the disease and/or prevent post-transplantation recurrence.

Food Allergies

- Studies designed to determine the prevalence of common food allergies in the U.S. active duty military population.
- Studies aimed at determining the relationship between gut permeability and food allergies and manipulation of the biome to prevent, mitigate, and treat food allergies.
- Studies to determine whether there is a link between the Maillard reaction and food allergies.
- Studies designed to determine what Service members and their families know, think, and feel about food allergies.

Fragile X Syndrome

- Research to determine the frequency of genetic testing for Fragile X syndrome in military children with global developmental delay, intellectual disability, or autism.

Healthcare-Acquired Infection Reduction

- Development of a multi-center infection control consortium in military hospitals to assess ways to reduce transmission of nosocomial pathogens.
- Research to improve understanding of bacterial mechanisms of resistance and ways to counter them.
- Development of new modalities to identify, prevent, and treat patients with *Clostridium difficile* infection.
- Development of new antimicrobials for the treatment of emerging resistant healthcare-associated infections.
- Establishment of a pilot program to determine whether restricting antibiotic use in military or civilian hospitals leads to reduction in multidrug-resistant pathogens.
- Assessment of proper implementation of existing healthcare-associated infection reduction techniques and technologies in military and civilian healthcare settings and identification of best practices for prevention.
- Utilization of a systems engineering approach to develop automated systems to remove human introduction of infection in high-risk processes.
- Research to identify minimum necessary infection control practices in the transport environment (e.g., fixed-wing aircraft, helicopter, ships, ambulance) to safely conduct clinical procedures, including dressing changes, central line placement, and surgery.
- Research to identify minimum necessary infection control practices in the forward surgical setting (e.g., tents and other temporary shelters, buildings of opportunity, and other non-clean environments) to safely conduct clinical procedures, including standard nursing care and operative procedures.

Hepatitis B

- Identification and reduction of hepatitis B virus in blood products for transfusion.

Hereditary Angioedema

- Research to improve early diagnosis of hereditary angioedema.

Hydrocephalus

- Research on the etiology, prevention, diagnosis, and treatment of delayed-onset hydrocephalus following traumatic brain injury.
- Research on how to manage hydrocephalus and resulting intracranial pressure in Service members who have sustained severe and/or penetrating head injury from point of injury through acute hospitalization.

Inflammatory Bowel Disease

- Clinical studies in human subjects directed toward understanding how acute enteric infections may trigger chronic bowel diseases with acute and sub-acute inflammation (e.g., inflammatory bowel disease, post-infectious functional bowel disorders) utilizing systems biology.
- Mechanistic studies in animal models designed specifically to understand how enteric infection may trigger chronic bowel diseases with acute and sub-acute inflammation (e.g., inflammatory bowel disease, post-infectious functional bowel disorders) including genomic, microbiomic, and immune mechanisms.
- Epidemiological studies of post-infectious acute and sub-acute inflammatory bowel disorders (e.g., inflammatory bowel disease, post-infectious functional bowel disorders) that define risk and provide estimates of illness-associated disability, healthcare costs, and symptom duration from a military health system and societal perspective.
- Studies (epidemiological, clinical, animal model) directed toward understanding the interaction between acute/chronic stress and infection and development of chronic bowel diseases with acute and sub-acute inflammatory features.
- Research to explore whether the travel patterns of active duty personnel increases the risk of developing inflammatory bowel disease by means of exposing them to potential changes in intestinal microflora.

Integrative Medicine

- Research on the use of integrative medicine in treatment and management of chronic pain disorders, including comparative efficacy studies relative to standard of care.
- Research on the use of integrative medicine in strategic aeromedical evacuation (i.e., non-pharmacy options that would improve transport experience for patients through the continuum of care).
- Rigorous longitudinal studies of integrative medicine approaches for enhancing resilience and for treating psychological health issues and co-occurring disorders.
- Development of outcomes tools and measures to evaluate the effectiveness of integrative medicine.

Interstitial Cystitis

- Studies that define the risk and prevalence of interstitial cystitis among active duty personnel.
- Studies that assess the impact of interstitial cystitis on the ability of patients to join, or remain, as active duty military personnel.

Lupus

- Development of early diagnosis technologies and strategies to detect lupus that can be implemented within the Military Health System.
- Development of improved treatment strategies for lupus, including approaches to identify patients at risk for developing to a more severe disease state and preventing lupus flares.
- Research on the long-term use of immunosuppressive drugs in patients with lupus and the likelihood of developing infections.

Malaria

- Development and optimization of multi-platform-based (i.e., protein, DNA, viral vector or live-attenuated) pre-erythrocytic-based malaria vaccines to increase efficacy and enable identification of correlates of protection in preclinical studies and clinical trials.
- Identification of novel pre-erythrocytic stage *Plasmodium vivax* antigens and assessment of potential predictors of candidate vaccine efficacy in preclinical studies and clinical trials.
- Development of orally administered, bioavailable, novel chemical entities or alternative formulations of known antimalarial drugs suitable for weekly prophylaxis, radical cure, treatment of severe/complicated disease indications, and to replace artemisinin class drugs in targeting immature blood stage parasites.
- Identification of modes of action of new-generation antimalarial drugs, optimization of drug combination strategies for new malaria therapeutics and prophylaxis indications, and characterization of interactions between 8-aminoquinoline class antimalarial drugs and cytochrome p450 2D6 enzyme to optimize development of next-generation anti-relapse malarial drugs.
- Research toward understanding the potential of dietary intake as a potential repellent to mosquito vectors and vector behavior.

Metals Toxicology

- Identification and development of biomarkers as a tool to evaluate exposure to toxic metals in an operational environment.
- Retrospective studies to evaluate risk and exposure among workers at DoD industrial facilities.
- Assessment of the health effects of embedded metal fragments and development of treatment strategies to enhance elimination of metals from the body.

Mitochondrial Disease

- Research to determine the frequency of genetic testing for mitochondrial diseases in military children with global developmental delay, intellectual disability, or autism.

Nanomaterials for Bone Regeneration

- Technologies addressing segmental/large bone defects in the craniomaxillofacial body region.
- Controlled release/extended release of growth factors for bone regeneration.
- Technologies that enable enhanced recruitment of endogenous cell populations for bone regeneration.
- Technologies that repair the soft tissue envelope to enhance bone regeneration.

Osteoarthritis

- Basic and translational research to identify treatments to reverse osteoarthritis.
- Studies to examine use of existing regenerative medicine techniques and therapies, including dose response information and frequency and timing of application.
- Research to establish activity recommendations for maximal joint life following joint repair, particularly in young patient populations.
- Repair of focal cartilage defects using cell-based therapies.
- Basic and translational research to describe the acute inflammatory response to neuromusculoskeletal combat injury as it relates to osteoarthritis.

Pancreatitis

- Retrospective studies to determine risk and incidence of pancreatitis among former and current active duty personnel.

Pathogen-Inactivated Dried Plasma

- Identify the clinical impact of administering dried plasma in the en route care system, before and during transport.

Polycystic Kidney Disease

- Development of improved treatment strategies for polycystic kidney disease, including approaches to identify and monitor patients at risk for progressing to end stage renal disease.

Post-Traumatic Osteoarthritis

- Development of best practices to maximize function and evaluation of multidisciplinary team (orthopaedics, pain, rehabilitation, etc.) approaches toward evaluating the success of treatment algorithms for post-traumatic osteoarthritis.
- Technologies that restore joint stability after injury (e.g., connective tissues such as ligament/tendon/meniscus structures).
- Sustained release, intra-articular injectable steroidal, non-steroidal, or disease-modifying therapies that offer two or more months of symptomatic relief of pain and/or inflammation in a single injection.

- Development of preventive therapies and/or techniques to minimize the progression of post-traumatic osteoarthritis after traumatic injury to the joint.
- Research to establish activity recommendations for maximal joint life following joint repair, particularly in young patient populations.

Psychotropic Medications

- Identification and/or development of therapies that can completely or selectively reverse the effects of psychotropic medications.
- Research into the use of psychotropic medications for the treatment of mental health disorders including post-traumatic stress, suicidal ideation, substance abuse, and other co-morbid disorders.
- Research to determine and test psychological interventions related to mental health issues specific to women in the military.
- Research toward increasing the accuracy and effectiveness of prescription practices for mental health medications, including but not limited to development of biomarkers to match patients to medications and follow treatment response, better measures of outcomes, and better collection of patient data in real time.
- Research on use of psychotropic medications in strategic aeromedical evacuation.

Pulmonary Fibrosis

- Research to enhance biomarker discovery work to identify indicators of pulmonary injury.
- Retrospective studies to determine risk and incidence of pulmonary fibrosis among former and current active duty personnel.

Respiratory Health (excluding lung cancer and mesothelioma)

- Development of an innovative, next-generation adenovirus vaccine, ideally one that may be modified for different adenovirus serotypes, for the prevention of acute respiratory illness caused by adenovirus.
- Research into opportunistic infections that will assist in understanding their basic metabolism, create ex vivo growth systems or small animal models where there are none available, and/or development of new agents with which to treat them as it relates to respiratory disease.
- Research on the cause, treatment, and prevention of respiratory symptoms and ailments possibly associated with deployed and re-deployed military personnel, including acute eosinophilic pneumonia, constrictive bronchiolitis, asthma, allergies, and other chronic lung diseases and breathing problems.
- Clinical assessments to determine the prevalence and severity of respiratory disease in returned Service members, including pre- and post-deployment and retrospective medical record studies.
- Studies to determine the natural history of deployment-related respiratory disease and to identify factors associated with respiratory disease.

- Identification and development of biomarkers of exposure for a set of military-relevant hazards selected from airborne nanomaterials, diesel exhaust, and other combustion products and fuels.
- Assessment of the impact of aeromedical evacuation on respiratory health, including ventilator settings, oxygen use, etc.
- Development of improved therapeutics for influenza.
- Research to improve the identification of pathogens in lower respiratory tract infections.

Rheumatoid Arthritis

- Research on the long-term use of immunosuppressants in patients with rheumatoid arthritis and the likelihood of developing infections.
- Research to better understand the relationship between genetic risk and environmental triggers, such as infection or smoking, in developing rheumatoid arthritis.
- Research to establish activity recommendations following joint replacement for maximal joint life.

Scleroderma

- Research into the etiology of localized and systemic scleroderma to inform development of improved, earlier diagnostic techniques.

Sleep Disorders

- Research on how the disruption of normal sleep and circadian biological rhythms adversely affects health, safety, performance, and productivity of military and civilian populations.
- How to prevent/reduce sleep disorders that are associated with long aeromedical evacuation flights for both clinical team members and patients (sleep/rest cycles, in-flight entertainment, etc.).
- Research to assess the validity of improving adherence to nightly CPAP (continuous positive airway pressure) in children with neurodevelopmental disorders and obstructive or mixed sleep apnea through habituation with behavioral techniques and pharmacological management.
- Research to identify the most effective treatment protocols for sleep disorders in DoD beneficiaries.
- Investigation of how mental disorders, and post-traumatic stress disorder in particular, combined with the disruption/degradation of sleep quality, impact long-term physical health through changes in glucocorticoid regulation.
- Research on non-pharmacological treatments for sleep disorders.

Tinnitus

- Research to understand the mechanisms of tinnitus, its relationship to noise-induced hearing loss, and progression to chronic tinnitus.
- Identification of effective non-invasive interventions to include neuromodulation and tinnitus retraining therapy for tinnitus treatment.
- Identification of novel therapies for early interventions to prevent tinnitus, including new uses for existing drugs, nutritional and pharmaceutical based strategies, and acoustic, electrical, and other stimulation technologies.
- Improvement of objective tools to diagnose and characterize tinnitus (e.g., imaging techniques to identify functional and structural changes in the brain).

Vascular Malformations

- Development of improved screening mechanisms to find vascular malformations and determination of whether such individuals should be allowed to serve in the military.
- Development of improved methods to diagnose and manage vascular disruptions with or without hemorrhagic shock.
- Development of improved methods to manage circulation and control junctional and truncal hemorrhaging in the pre-hospital environment.

Women's Heart Disease

- Retrospective studies to determine risk and incidence of heart disease among former and current female active duty personnel.
- Research on trauma-induced cardiac arrest secondary to hemorrhage and polytrauma in the female population.