

I. OVERVIEW OF THE FUNDING OPPORTUNITY

Program Announcement for the Department of Defense

Defense Health Program

Congressionally Directed Medical Research Programs

Peer Reviewed Medical Research Program

Discovery Award

Announcement Type: Modified

Funding Opportunity Number: W81XWH-20-PRMRP-DA

**Catalog of Federal Domestic Assistance Number: 12.420 Military Medical
Research and Development**

SUBMISSION AND REVIEW DATES AND TIMES

- **Pre-Application Submission Deadline:** 5:00 p.m. Eastern time (ET), May 7, 2020
- **Application Submission Deadline:** 11:59 p.m. ET, May 21, 2020
- **End of Application Verification Period:** 5:00 p.m. ET, May 27, 2020
- **Peer Review:** July 2020
- **Programmatic Review:** September 2020

This Program Announcement must be read in conjunction with the General Application Instructions, version 501. The General Application Instructions document is available for downloading from the Grants.gov funding opportunity announcement by selecting the “Package” tab, clicking “Preview,” and then selecting “Download Instructions.”

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II. DETAILED INFORMATION ABOUT THE FUNDING OPPORTUNITY

II.A. Program Description

Applications to the Fiscal Year 2020 (FY20) Peer Reviewed Medical Research Program (PRMRP) are being solicited for the Defense Health Agency (DHA) J9, Research and Development Directorate, by the U.S. Army Medical Research Acquisition Activity (USAMRAA) using delegated authority provided by United States Code, Title 10, Section 2358 (10 USC 2358). As directed by the Office of the Assistant Secretary of Defense for Health Affairs (OASD[HA]), the DHA manages the Defense Health Program (DHP) Research, Development, Test, and Evaluation (RDT&E) appropriation. The execution management agent for this Program Announcement is the Congressionally Directed Medical Research Programs (CDMRP). The PRMRP was initiated in 1999 to provide medical research projects of clear scientific merit and direct relevance to military health. Appropriations for the PRMRP from FY99 through FY19 totaled \$2.35 billion (B). The FY20 appropriation is \$360 million (M).

The vision of the FY20 PRMRP is to improve the health, care, and well-being of all military Service members, Veterans, and beneficiaries, and its mission is to encourage, identify, select, and manage medical research projects of clear scientific merit and direct relevance to military health. The PRMRP challenges the scientific and clinical communities to address the FY20 PRMRP 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, epidemiological, 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. *The proposed research must be relevant to active duty Service members, Veterans, military beneficiaries, and/or the American public.*

II.A.1. FY20 PRMRP Topic Areas

All applications for PRMRP funding must specifically address at least one of the Topic Areas as directed by Congress and have direct relevance to military health. If the proposed research does not specifically address at least one of the FY20 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 FY20 PRMRP Topic Areas are listed below.

- Arthritis
- Burn Pit Exposure
- Chronic Migraine and Post-Traumatic Headache
- Congenital Heart Disease
- Constrictive Bronchiolitis
- Diabetes
- Dystonia
- Eating Disorders
- Emerging Viral Diseases

- Endometriosis
- Epidermolysis Bullosa
- Familial Hypercholesterolemia
- Fibrous Dysplasia
- Focal Segmental Glomerulosclerosis
- Food Allergies
- Fragile X
- Frontotemporal Degeneration
- Guillain-Barré Syndrome
- Hemorrhage Control
- Hepatitis B
- Hydrocephalus
- Immunomonitoring of Intestinal Transplants
- Inflammatory Bowel Diseases
- Interstitial Cystitis
- Metals Toxicology
- Mitochondrial Disease
- Musculoskeletal Health
- Myalgic Encephalomyelitis/Chronic Fatigue Syndrome
- Myotonic Dystrophy
- Nutrition Optimization
- Pancreatitis
- Pathogen-Inactivated Blood Products
- Plant-Based Vaccines
- Polycystic Kidney Disease
- Pressure Ulcers
- Pulmonary Fibrosis
- Resilience Training
- Respiratory Health
- Rheumatoid Arthritis
- Sleep Disorders and Restriction
- Spinal Muscular Atrophy
- Sustained Release Drug Delivery
- Vascular Malformations
- Women's Heart Disease

Applicants should select the FY20 PRMRP Program Announcement most appropriate to the stage of the proposed research. Areas of Encouragement related to the FY20 PRMRP Topic Areas have been identified by the Department of Defense (DoD), the Department of Veterans Affairs (VA), and other relevant stakeholders ([Appendix 2](#)). Applicants are urged to read and consider these Areas of Encouragement before preparing their applications. *The information provided is not exhaustive, and applicants are not restricted to submitting applications that address an Area of Encouragement on this list.*

II.B. Award Information

The intent of the PRMRP Discovery Award is to ***support innovative, non-incremental, 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.

Innovation is the most important review criterion. Innovative research may introduce a new paradigm, look at existing problems from new perspectives, or exhibit other highly creative qualities. Research that represents an incremental advancement on previously published work is not considered innovative. The following list, although not all-inclusive, provides examples of research that is ***not innovative***:

- Using a published series of in vitro assays to further characterize a model system
- Incorporating known biomarkers into in vivo or clinical models of the disease or condition
- Investigating the next logical step or continuation of a previous research project
- Proposing work that is an incremental advancement of published data

Inclusion of preliminary data is not required, but is allowed. The strength of the proposed research should be based on sound scientific rationale and logical reasoning. The presentation of substantial preliminary data suggests that the proposed research project would be more appropriately submitted to a different award mechanism. 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. ***Absence of preliminary data will not negatively affect scientific or programmatic review of the application.***

Early career investigators, including postdoctoral fellows (or equivalent), are encouraged to be named by the organization as the Principal Investigator (PI) on the application.

Reviewers at both tiers of review will be blinded to the identity of the PI, collaborator(s), and their organization(s). Due to the blinded nature of the review process, identifying or making references to the PI, collaborator(s), or their organization(s) in certain components of the application is prohibited and will result in administrative rejection of the application. Refer to [Section II.D.2.b.i, Full Application Guidelines](#), for more information. 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>).

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

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

PIs are encouraged to integrate and/or align their research projects with DoD and/or VA research laboratories and programs. Collaboration with DoD or VA investigators 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. A list of websites that may be useful in identifying additional information about ongoing DoD and VA areas of research interest or potential opportunities for collaboration within the FY20 PRMRP Topic Areas can be found in [Appendix 3](#).

The types of awards made under the Program Announcement will be assistance agreements. An assistance agreement is appropriate when the Federal Government transfers a “thing of value” to a “state, local government” or “other recipient” to carry out a public purpose of support or stimulation authorized by a law of the United States instead of acquiring property or service for the direct benefit and use of the U.S. Government. An assistance agreement can take the form of a grant or cooperative agreement. The level of involvement on the part of the DoD during project performance is the key factor in determining whether to award a grant or cooperative agreement. If “no substantial involvement” on the part of the funding agency is anticipated, a grant award will be made (31 USC 6304). Conversely, if substantial involvement on the part of the funding agency is anticipated, a cooperative agreement will be made (31 USC 6305), and the award will identify the specific substantial involvement. Substantial involvement may include, but is not limited to, collaboration, participation, or intervention in the research to be performed under the award. The award type, along with the start date, will be determined during the negotiation process.

The anticipated direct costs budgeted for the entire period of performance for an FY20 PRMRP Discovery Award will not exceed **\$200,000**. Refer to [Section II.D.5, Funding Restrictions](#), for detailed funding information.

Awards will be made no later than September 30, 2021. For additional information refer to [Section II.F.1, Federal Award Notices](#).

The CDMRP expects to allot approximately \$22.5M to fund approximately 75 Discovery Award applications. Funding of applications received is contingent upon the availability of Federal funds for this program as well as the number of applications received, the quality and merit of the applications as evaluated by scientific and programmatic review, and the requirements of the Government. Funds to be obligated on any award resulting from this

funding opportunity will be available for use for a limited time period based on the fiscal year of the funds. It is anticipated that awards made from this FY20 funding opportunity will be funded with FY20 funds, which will expire for use on September 30, 2026.

Research involving animals, 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.htm>. PIs seeking funding for a clinical trial should apply to the FY20 PRMRP Clinical Trial Award mechanism (W81XWH-20-PRMRP-CTA).

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 Development Command (USAMRDC) Office of Research Protections (ORP), Human Research Protection Office (HRPO), prior to research implementation. This administrative review requirement is in addition to the local Institutional Review Board (IRB) or Ethics Committee (EC) review. Local IRB/EC approval at the time of submission is *not* required. *Allow a minimum of 2 to 3 months for HRPO regulatory review and approval processes*. Refer to the General Application Instructions, Appendix 1, and the Human Subject Resource Document available on the electronic Biomedical Research Application Portal (eBRAP) “Funding Opportunities & Forms” web page (<https://ebrap.org/eBRAP/public/Program.htm>) for additional information. If the proposed research is cooperative (i.e., involving more than one institution), a written plan for single IRB review arrangements must be provided at the time of application submission or award negotiation. The lead institution responsible for developing the master protocol and master consent form should be identified and should be the single point of contact for regulatory submissions and requirements.

Research Involving Animals: All DoD-funded research involving new and ongoing research with animals must be reviewed and approved by the USAMRDC 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. *Allow at least 3 to 4 months for ACURO regulatory review and approval processes for animal studies*. Refer to the General Application Instructions, Appendix 1, for additional information.

II.C. Eligibility Information

II.C.1. Eligible Applicants

II.C.1.a. Organization: All organizations, including international organizations, are eligible to apply.

Government Agencies Within the United States: Local, state, and Federal Government agencies are eligible to the extent that applications do not overlap with their fully funded internal programs. Such agencies are required to explain how their applications do not overlap with their internal programs.

As applications for this Program Announcement may be submitted by extramural and intramural organizations, these terms are defined below.

Extramural Organization: An eligible non-DoD organization. Examples of extramural organizations include academic institutions, biotechnology companies, foundations, Federal Government organization other than the DoD, and research institutes.

Intramural DoD Organization: A DoD laboratory, DoD military treatment facility, and/or DoD activity embedded within a civilian medical center. ***Intramural Submission: Application submitted by a DoD organization for an intramural investigator working within a DoD laboratory or military treatment facility or in a DoD activity embedded within a civilian medical center.***

USAMRAA makes awards to eligible organizations, not to individuals.

II.C.1.b. Principal Investigator

Investigators at the level of postdoctoral fellow or clinical fellow (or equivalent) and above may be named by the organization as the PI on the application.

There is no limitation on the number of applications for which an investigator may be named by the organization as a PI.

An eligible PI, regardless of ethnicity, nationality, or citizenship status, must be employed by, or affiliated with, an eligible organization.

The CDMRP encourages all PIs to participate in a digital identifier initiative through Open Researcher and Contributor ID, Inc. (ORCID). Registration for a unique ORCID identifier can be done online at <https://orcid.org/>.

II.C.2. Cost Sharing

Cost sharing/matching is not an eligibility requirement.

II.C.3. Other

Organizations must be able to access **.gov** and **.mil** websites in order to fulfill the financial and technical deliverable requirements of the award and submit invoices for payment.

For general information on required qualifications for award recipients, refer to the General Application Instructions, Appendix 3.

Refer to [Section II.H.2, Administrative Actions](#), for a list of administrative actions that may be taken if a pre-application or application does not meet the administrative, eligibility, or ethical requirements defined in this Program Announcement.

II.D. Application and Submission Information

Submission of applications that are essentially identical or propose essentially the same research project to different funding opportunities within the FY20 PRMRP is prohibited and will result in administrative withdrawal of the duplicative application(s). As an exception, applicants may submit the research project described in their Discovery Award application as part of an application to the FY20 PRMRP Focused Program Award (Funding Opportunity Number: W81XWH-20-PRMRP-FPA); however, accepting multiple awards to support the same project will not be allowed.

Extramural Submission:

- Pre-application content and forms must be accessed and submitted at eBRAP.org.
- Full application packages must be accessed and submitted at Grants.gov.

Intramural DoD Submission:

- Pre-application content and forms must be accessed and submitted at eBRAP.org.
- Full application packages must be accessed and submitted at eBRAP.org

Note: Applications from an intramural DoD organization or from an extramural Federal Government organization may be submitted to Grants.gov through a research foundation.

II.D.1. Address to Request Application Package

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.

Contact information for the CDMRP Help Desk and the Grants.gov Contact Center can be found in [Section II.G, Federal Awarding Agency Contacts](#).

II.D.2. Content and Form of the Application Submission

Submission is a two-step process requiring both *pre-application* (eBRAP.org) and *full application* (eBRAP.org or Grants.gov) as indicated below. The submission process should be started early to avoid missing deadlines. There are no grace periods. Full application submission guidelines differ for extramural (Grants.gov) and intramural (eBRAP.org) organizations (refer to [Table 1. Full Application Guidelines](#)).

The application title, eBRAP log number, and all information for the PI, Business Official(s), performing organization, and contracting organization must be consistent throughout the entire pre-application and full application submission process. Inconsistencies may delay application processing and limit or negate the ability to view, modify, and verify the application

in eBRAP. If any changes need to be made, the applicant should contact the CDMRP Help Desk at help@eBRAP.org or 301-682-5507 prior to the application submission deadline.

II.D.2.a. Step 1: Pre-Application Submission Content

During the pre-application process, eBRAP assigns each submission a unique log number. This unique eBRAP log number is required during the full application submission process.

To begin the pre-application process, first select whether the submitting organization is extramural or intramural, then confirm your selection or cancel. **Incorrect selection of extramural or intramural submission type will delay processing.**

If an error has been made in the selection of extramural versus intramural and the pre-application submission deadline has passed, the PI or Business Official must contact the CDMRP Help Desk at help@eBRAP.org or 301-682-5507 to request a change in designation.

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

The applicant organization and associated PI 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 applicant must contact the CDMRP Help Desk at help@eBRAP.org or 301-682-5507.

PIs with an ORCID identifier should enter that information in the appropriate field in the “My Profile” tab in the “Account Information” section of eBRAP.

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):

- **Tab 1 – Application Information**

Submission of application information includes assignment of primary and secondary research classification codes, which may be found at <https://ebrap.org/eBRAP/public/Program.htm>. Applicants are strongly encouraged to review and confirm the codes prior to making their selection.

Select the FY20 PRMRP Topic Area addressed by the proposed research. If the proposed research project is aligned with more than one FY20 PRMRP Topic Area, select the Topic Area of highest relevance as the required first choice.

- **Tab 2 – Application Contacts**

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 SF424 Research & Related Form). The Business

Official must be either selected from the eBRAP list or invited in order for the pre-application to be submitted.

Select the performing organization (site at which the PI will perform the proposed work) and the contracting organization (organization submitting on behalf of the PI, which corresponds to Block 5 on the Grants.gov SF424 Research & Related Form), and click on “Add Organizations to this Pre-application.” The organization(s) must be either selected from the eBRAP drop-down list or invited in order for the pre-application to be submitted.

It is recommended that applicants identify an Alternate Submitter in the event that assistance with pre-application submission is needed.

- **Tab 3 – Collaborators and Key Personnel**

Enter the name, organization, and role of all collaborators and key personnel associated with the application.

[FY20 PRMRP Programmatic Panel members](#) should not be involved in any pre-application or application. For questions related to panel members and pre-applications or applications, refer to [Section II.H.2.c, Withdrawal](#), or contact the CDMRP Help Desk at help@eBRAP.org or 301-682-5507.

- **Tab 4 – Conflicts of Interest**

List all individuals other than collaborators and key personnel who may have a conflict of interest in the review of the application (including those with whom the PI has a personal or professional relationship).

- **Tab 5 – Pre-Application Files**

Letter of Intent (LOI) (one-page limit): Provide a brief description of the research to be conducted. Include the FY20 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.

- **Tab 6 – Submit Pre-Application**

This tab must be completed for the pre-application to be accepted and processed.

II.D.2.b. Step 2: 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 full application package for this Program Announcement. The full application package is submitted by the Authorized Organizational Representative through Grants.gov (<https://www.grants.gov/>) for extramural

organizations or through eBRAP (<https://ebrap.org/>) for intramural organizations. See Table 1 below for more specific guidelines.

II.D.2.b.i. Full Application Guidelines

Extramural organizations must submit full applications through Grants.gov. Applicants must create a Grants.gov Workspace for submission, which allows the application components to be completed online and routed through the applicant organization for review prior to submission. Applicants may choose to download and save individual PDF forms rather than filling out webforms in Workspace. A compatible version of Adobe Reader **must** be used to view, complete, and submit an application package consisting of PDF forms. If more than one person is entering text into an application package, the **same version** of Adobe Reader software should be used by each person. Check the version number of the Adobe software on each user’s computer to make sure the versions match. Using different versions of Adobe Reader may cause submission and/or save errors – even if each version is individually compatible with Grants.gov. Refer to the General Application Instructions, Section III, and the “Apply For Grants” page of Grants.gov (<https://www.grants.gov/web/grants/applicants/apply-for-grants.html>) for further information about the Grants.gov Workspace submission process. Submissions of extramural applications through eBRAP may be withdrawn.

Do not password protect any files of the application package, including the Project Narrative.

Table 1. Full Application Submission Guidelines

Extramural Submissions	Intramural DoD Submissions
Application Package Location	
Download application package components for W81XWH-20-PRMRP-DA from Grants.gov (https://www.grants.gov) and create a Grants.gov Workspace. Workspace allows online completion of the application components and routing of the application package through the applicant organization for review prior to submission.	Download application package components for W81XWH-20-PRMRP-DA from eBRAP (https://ebrap.org).
Full Application Package Components	
SF424 Research & Related Application for Federal Assistance Form: Refer to the General Application Instructions, Section III.A.1, for detailed information.	<p>Tab 1 – Summary: Provide a summary of the application information.</p> <p>Tab 2 – Application Contacts: This tab will be pre-populated by eBRAP; add Authorized Organizational Representative.</p>

Extramural Submissions	Intramural DoD Submissions
<p>Descriptions of each required file can be found under Full Application Submission Components:</p> <ul style="list-style-type: none"> • Attachments • Research & Related Personal Data • Research & Related Senior/Key Person Profile (Expanded) • Research & Related Budget • Project/Performance Site Location(s) Form • Research & Related Subaward Budget Attachment(s) Form (if applicable) 	<p>Tab 3 – Full Application Files: Upload files under each Application Component in eBRAP. Descriptions of each required file can be found under Full Application Submission Components:</p> <ul style="list-style-type: none"> • Attachments • Key Personnel • Budget • Performance Sites <p>Tab 4 – Application and Budget Data: Review and edit proposed project start date, proposed end date, and budget data pre-populated from the Budget Form.</p>
Application Package Submission	
<p>Create a Grants.gov Workspace. Add participants (investigators and Business Officials) to Workspace, complete all required forms, and check for errors before submission.</p> <p>Submit a Grants.gov Workspace Package. An application may be submitted through Workspace by clicking the “Sign and Submit” button on the “Manage Workspace” page, under the “Forms” tab. Grants.gov recommends submission of the application package at least 24-48 hours prior to the close date to allow time to correct any potential technical issues that may disrupt the application submission.</p> <p>Note: If either the Project Narrative or the budget fails eBRAP validation or if the Project Narrative or the budget 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 <i>prior to</i> the application submission deadline. <i>Do not password protect any files of the application package, including the Project Narrative.</i></p>	<p>Submit package components to eBRAP (https://ebrap.org).</p> <p>Tab 5 – Submit/Request Approval Full Application: After all components are uploaded and prior to the full application submission deadline, enter your password in the space provided next to “Enter Your Password Here” and press the “Submit Full Application” button. eBRAP will notify your Resource Manager/ Comptroller/Task Area Manager or equivalent Business Official by email. <i>Do not password protect any files of the application package, including the Project Narrative.</i></p>

Extramural Submissions	Intramural DoD Submissions
<u>Application Verification Period</u>	
<p>The full application package submitted to Grants.gov may be viewed and modified in eBRAP until the end of the application verification period. During the application verification period, the full application package may be modified <i>with the exception of the Project Narrative and Research & Related Budget Form</i>.</p>	<p>After eBRAP has processed the full application, the organizational Resource Manager/Comptroller/Task Area Manager or equivalent Business Official and PI will receive email notification of this status and will be able to view and modify application components in eBRAP. During the application verification period, the full application package may be modified <i>with the exception of the Project Narrative and Research & Related Budget Form</i>. Your Resource Manager/Comptroller/Task Area Manager or equivalent Business Official should log into eBRAP to review and to approve prior to the application verification deadline.</p>
Further Information	
<p>Tracking a Grants.gov Workspace Package. After successfully submitting a Workspace package, a Grants.gov Tracking Number is automatically assigned to the package. The number will be listed on the “Confirmation” page that is generated after submission.</p> <p>Refer to the General Application Instructions, Section III, for further information regarding Grants.gov requirements.</p>	<p>Refer to the General Application Instructions, Section IV, for further information regarding eBRAP requirements.</p>

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, collaborator(s), or their organization(s) in the Project Narrative, Supporting Documentation, Technical and Lay Abstracts, Relevance to Military Health 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, 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 (uniform resource locators, or web addresses), or in any other way highlighting the names of the PI, collaborator(s), or their organization(s), is prohibited and will result in administrative rejection of the application and preclude invitation to submit a full application.

Although required, Research & Related Budget, Research & Related Subaward Budget Attachment(s) 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.

The full application package must be submitted using the unique eBRAP log number to avoid delays in application processing.

II.D.2.b.ii. Full Application Submission Components

- **Extramural Applications Only**

SF424 Research & Related Application for Federal Assistance Form: Refer to the General Application Instructions, Section III.A.1, for detailed information.

- **Extramural and Intramural Applications**

Attachments:

Each attachment to the full application components must be uploaded as an individual file in the format specified and in accordance with the formatting guidelines listed in the General Application Instructions, Appendix 4.

For all attachments, ensure that the file names are consistent with the guidance. Attachments will be rejected if the file names are longer than 50 characters or have incorrect file names that contain characters other than the following: A-Z, a-z, 0-9, underscore, hyphen, space, and period. In addition, there are file size limits that may apply in some circumstances. Individual attachments may not exceed 20 MB, and the file size for the entire full application package may not exceed 200 MB. *It is important to include the attachment name as a header on each page of the attachment files.*

- **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) 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. Due to the blinded nature of the review process, *do not include information that identifies the PI, collaborator(s), or their organization(s).*

- **Background:** Describe how the proposed research project addresses one or more of the FY20 PRMRP Topic Areas. Present the ideas and reasoning behind the proposed work. Cite relevant literature. Inclusion of preliminary data is not required.
- **Hypothesis:** State the hypothesis to be tested.

- **Specific Aims:** Concisely explain the project’s specific aims and the objective(s) to be reached. If the proposed work is part of a larger study, present only aims that this DoD award would fund.
- **Research Strategy and Feasibility:** Describe the experimental design, methods, and analyses, including appropriate controls, in sufficient detail for scientific evaluation. If cell lines or animals are to be used, justify why the proposed cell line(s) or animal model(s) were chosen. If applicable, describe the statistical and other data analyses to be used to justify the number of research subjects (animal or human) and assess the data collected. Address potential problem areas and present alternative methods and approaches. Describe how the research project will be completed within the proposed period of performance. Clinical trials are not allowed under the Discovery Award mechanism.
- **Innovation:** Describe how the proposed research is 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: Combine and upload as a single file named “Support.pdf”.** Start each document on a new page. If documents are scanned to PDF, the lowest resolution (100 to 150 dpi) should be used. The Supporting Documentation attachment should not include additional information such as figures, tables, graphs, photographs, diagrams, chemical structures, or drawings. These items should be included in the Project Narrative.

There are no page limits for any of these components unless otherwise noted. Include only those components described below; inclusion of items not requested or viewed as an extension of the Project Narrative will result in the removal of those items or may result in administrative withdrawal of the application.

- **References Cited (25-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, collaborator(s), or their organization(s).***
- **List of Abbreviations, Acronyms, and Symbols:** Provide a list of abbreviations, acronyms, and symbols. ***Do not include information that will identify the PI, collaborator(s), or their organization(s).***
- **Attachment 3: Technical Abstract (one-page limit): Upload as “TechAbs.pdf”.** The technical abstract is used by all reviewers. Abstracts of all funded research projects will be posted publicly. ***Do not include proprietary or confidential information.*** Use only characters available on a standard QWERTY keyboard. Spell out all Greek letters, other non-English letters, and symbols. Graphics are not allowed.

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 FY20 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”.** The lay abstract is used by all reviewers. Abstracts of all funded research projects will be posted publicly. **Do not include proprietary or confidential information.** 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 FY20 PRMRP Topic Area(s) addressed by the proposed research project. Include an overview of the proposed research project that can be **readily understood by readers without a background in science or medicine.** Clearly describe the 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 (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.

The SOW should include a list of major tasks that support the proposed specific aims, followed by a series of subtasks outlined related to the major tasks and milestones within the period of performance. The SOW should describe only the work for which funding is being requested by this application and, as applicable, should also:

- Include the name(s) of the key personnel and contact information for each study site/subaward site.
- Indicate the number (and type, if applicable) of research subjects (animal or human) and/or human anatomical samples projected or required for each task and at each site. Refer to the General Application Instructions, Appendix 1, for additional information regarding regulatory requirements.
- If applicable, indicate timelines required for regulatory approvals relevant to animal or human subjects research such as IACUC or IRB, USAMRDC ACURO or HRPO.

The SOW will not be forwarded for peer or programmatic review.

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

Explain why the proposed research project is important and relevant to the FY20 PRMRP Topic Area(s) addressed. Describe the critical problem or important scientific question in the relevant Topic Area(s) that is addressed in the proposed research. If applicable, describe how the project addresses one or more of the FY20 PRMRP Areas of Encouragement ([Appendix 2](#)). Outline the potential impact, either short-term or long-term, of the proposed research on the field of study and/or patient care. Describe how the research has the potential to generate preliminary data that can be used as a foundation for future research projects. *Do not include information that identifies the PI, collaborator(s), or their organization(s).*

- **Attachment 7: Relevance to Military Health Statement (one-page limit): Upload as “MilRel.pdf”.** *Do not include information that identifies the PI, collaborator(s), or their organization(s).*

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 in the general population as well as in military Service members, Veterans, and/or beneficiaries.

Describe the population(s) or dataset(s), without information identifying the PI, collaborator(s), or their organization(s), that will be used in the proposed research project, the appropriateness of the population(s)/dataset(s) for the proposed study, and the feasibility of accessing the population(s)/dataset(s).

Provide a description of how the knowledge, information, products, technologies or applications gained from the research could be implemented in a dual-use capacity to benefit the civilian population that also addresses a need related to military health, as appropriate.

- **Attachment 8: Letters of Support: Start each document on a new page. Combine and upload as “Letters.pdf”.** 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: Equipment List, if applicable: Upload as “Equipment.pdf”.** If the proposed research is unusual or highly specialized, provide a list of equipment available for the proposed research. *Do not include information that identifies the PI, collaborator(s), or their organization(s).*
- **Attachment 10: Representations, if applicable (extramural submissions only): Upload as “RequiredReps.pdf”.** All extramural applicants must complete and submit the Required Representations template available on eBRAP (<https://ebrap.org/eBRAP/public/Program.htm>). For more information, see the General Application Instructions, Appendix 5, Section B, Representations.
- **Attachment 11: Suggested Collaborating DoD Military Facility Budget Format, if applicable: Upload as “MFBudget.pdf”.** If a military facility (Military Health System facility, research laboratory, medical 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 a separate budget, using “Suggested Collaborating DoD Military Facility Budget Format,” available for download on the eBRAP “Funding Opportunities & Forms” web page <https://ebrap.org/eBRAP/public/Program.htm>), including a budget justification, for each military facility as instructed. The costs per year should be included on the Grants.gov Research & Related Budget Form under subaward costs. Refer to the General Application Instructions, Section III.A.8, for detailed information.

- **Extramural and Intramural Applications**

To evaluate compliance with Title IX of the Education Amendments of 1972 (20 USC A§1681 et seq.), the DoD is collecting certain demographic and career information to be able to assess the success rates of women who are proposed for key roles in applications in science, technology, engineering, and/or mathematics (STEM) disciplines. To enable this assessment, each application must include the following forms completed as indicated.

Research & Related Personal Data: For extramural submissions (via Grants.gov), refer to the General Application Instructions, Section III.A.3, and for intramural submissions (via eBRAP), refer to the General Application Instructions, Section IV.A.2, for detailed information.

Research & Related Senior/Key Person Profile (Expanded): For extramural submissions (via Grants.gov), refer to the General Application Instructions, Section III.A.4, and for intramural submissions (via eBRAP), refer to the General Application Instructions, Section IV.A.3, 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 National Institutes of Health Biographical Sketch may also be used. All biographical sketches should be submitted in uneditable PDF format.

- 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”.

Research & Related Budget: For extramural submissions (via Grants.gov), refer to the General Application Instructions, Section III.A.5, and for intramural submissions (via eBRAP), refer to the General Application Instructions, Section IV.A.4, 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.

Project/Performance Site Location(s) Form: For extramural submissions (via Grants.gov), refer to the General Application Instructions, Section III.A.6, and for intramural submissions (via eBRAP), refer to the General Application Instructions, Section IV.A.5, for detailed information.

- **Extramural Applications Only**

Research & Related Subaward Budget Attachment(s) Form (if applicable): Refer to the General Application Instructions, Section III.A.7, for detailed information.

- **Extramural Subaward:** Complete the Research & Related Subaward Budget Form through Grants.gov. (Refer to the General Application Instructions, Section III.A.7, for detailed information.) Verify subaward budget(s) and budget justification forms are present in eBRAP during the application verification period. If these components are missing, upload them to eBRAP before the end of the application verification period.
- **Intramural DoD Collaborator(s):** Complete the “Suggested Collaborating DoD Military Facility Budget Format” and upload to Grants.gov attachment form as [Attachment 11](#). (Refer to the General Application Instructions, Section IV.A.4, for detailed information.) Each Intramural DoD Collaborator should include costs per year on the Grants.gov Research & Related Budget Form under subaward costs.

II.D.3. Dun and Bradstreet Data Universal Numbering System (DUNS) Number and System for Award Management (SAM)

Applicant organizations and all sub-recipient 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. Verify the status of the applicant organization’s Entity registration in SAM well in advance of the application submission deadline. Allow several weeks to complete

the entire SAM registration process. If an applicant has not fully complied with the requirements at the time the Federal awarding agency is ready to make a Federal award, the Federal awarding agency may determine that the applicant is not qualified to receive a Federal award and use that determination as a basis for making a Federal award to another applicant. Refer to the General Application Instructions, Section III, for further information regarding Grants.gov requirements.

Announcement of Transition to SAM-Generated Unique Entity Identifier (UEI): Through December 2020, a transition from DUNS to the SAM-generated UEI will occur. Refer to the General Application Instructions, Section III.1, DUNS Number, for more information on the transition and timing.

II.D.4. Submission Dates and Times

All submission dates and times are indicated in [Section I, Overview of the Funding Opportunity](#). Pre-application and application submissions are required. The pre-application and application submission process should be started early to avoid missing deadlines. There are no grace periods. Failure to meet either of these deadlines will result in submission rejection.

Applicant Verification of Full Application Submission in eBRAP

For Both Extramural and Intramural Applicants: eBRAP allows an organization's representatives and PIs to view and modify the full application submissions associated with them. Following retrieval and processing of the full application, eBRAP will notify the organizational representatives and PI by email to log into eBRAP to review, modify, and verify the full application submission. eBRAP will validate full application files against the specific Program Announcement requirements, and discrepancies will be noted in an email to the PI and in the "Full Application Files" tab in eBRAP. eBRAP does not confirm the accuracy of file content. Application viewing, modification, and verification in eBRAP are strongly recommended, but not required. It is the applicant's responsibility to review all application components and ensure proper ordering as specified in the Program Announcement. ***If either the Project Narrative or the budget fails eBRAP validation or needs to be modified, an updated full application package must be submitted prior to the application submission deadline. The Project Narrative and Research & Related Budget Form cannot be changed after the application submission deadline.*** Other application components may be changed until the end of the application verification period. Verify that subaward budget(s) and budget justification forms are present in eBRAP during the application verification period. If these components are missing, upload them to eBRAP before the end of the application verification period. After the end of the application verification period, the full application cannot be modified.

Extramural Submission: The full application package submitted to Grants.gov may be viewed and modified in eBRAP until the end of the application verification period. During the application verification period, the full application package, ***with the exception of the Project Narrative and Budget Form***, may be modified.

Intramural DoD Submission: After eBRAP has processed the full application, the organizational Resource Manager/Comptroller/Task Area Manager or equivalent Business Official and PI will receive email notification of the status and will be able to view and modify

application components in eBRAP. During the application verification period, the full application package, ***with the exception of the Project Narrative and Budget Form***, may be modified. The Resource Manager/Comptroller/Task Area Manager or equivalent Business Official should log into eBRAP to review and to approve the application package prior to the application verification deadline.

For All Submissions: Verify that subaward budget(s) with budget justification are present in eBRAP during the application verification period. If these components are missing, upload them to eBRAP before the end of the application verification period.

II.D.5. Funding Restrictions

The maximum period of performance is **2** years.

The anticipated direct costs budgeted for the entire period of performance will not exceed **\$200,000**. If indirect cost rates have been negotiated, indirect costs are to 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 cost rate exceeding the organization's negotiated rate.

All direct and indirect costs of any subaward or contract 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 **2** years.

For this award mechanism, direct costs may be requested for (not all-inclusive):

- Support for multidisciplinary collaborations, including travel
- Travel costs for one investigator to travel to one scientific/technical meeting per year.

Must not be requested for:

- Tuition

For extramural awards with an intragovernmental component, direct transfer of funds from an extramural award recipient to a DoD or other Federal agency is not allowed except under very limited circumstances. Funding to intramural DoD and other Federal agencies will be managed through a direct funds transfer. Intramural applicants are responsible for coordinating through their agency's procedures the use of contractual or assistance funding awards or other appropriate agreements to support extramural collaborators.

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

II.D.6. Other Submission Requirements

Refer to the General Application Instructions, Appendix 4, for detailed formatting guidelines.

II.E. Application Review Information

II.E.1. Criteria

II.E.1.a. Peer Review

To determine technical merit, all applications will be evaluated according to the following **scored criteria**, *where Innovation is the most significant scored criterion*, and the remaining are of equal importance:

- **Innovation**
 - To what extent the proposed research will provide new insights, or new paradigms, or new technologies, or new 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.
- **Research Strategy and Feasibility**
 - How well the scientific rationale supports the proposed research project and its feasibility.
 - How well the hypothesis, experimental design, methods, and analyses support the feasibility of completing the aims.
 - If preliminary data are included, how well they support the proposed research.
 - How well potential problems are identified and alternative approaches are addressed.
 - Whether the proposed research project can be completed within the proposed performance period.
- **Impact**
 - To what extent the proposed research project impacts a critical problem or an important scientific question relevant to at least one of the FY20 PRMRP Topic Areas.
 - To what extent the research has the potential to generate preliminary data that can be used as a foundation for future research projects.
 - To what extent the proposed research has potential for impact, either short-term or long-term, on the field of study and/or patient care.

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.

II.E.1.b. 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:

- Ratings and evaluations of the peer reviewers
- Relevance to the mission of the DHP and FY20 PRMRP, as evidenced by the following:
 - Adherence to the intent of the award mechanism
 - Relative innovation
 - Relative impact
 - Relevance to military health
 - Program portfolio composition

II.E.2. Application Review and Selection Process

All applications are evaluated by scientists, clinicians, and consumers in a two-tier review process. The first tier is **peer review**, the evaluation of applications against established criteria to determine technical merit, where each application is assessed for its own merit, independent of other applications. The second tier is **programmatic review**, a comparison-based process in which applications with high scientific and technical merit are further evaluated for programmatic relevance. Final recommendations for funding are made to the Commanding General, USAMRDC, on behalf of the DHA and the OASD(HA). ***The highest-scoring applications from the first tier of review are not automatically recommended for funding. Funding recommendations depend on various factors as described in [Section II.E.1.b, Programmatic Review](#).*** Additional information about the two-tier process used by the CDMRP can be found at <https://cdmrp.army.mil/about/2tierRevProcess>. An information paper describing the funding recommendations and review process for the award mechanisms for the PRMRP will be provided to the PI and posted on the CDMRP website. For this Program Announcement, reviewers at both tiers of review will be blinded to the identity of the PI, 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 statement declaring 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 and approval 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 and approval 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 18 USC 1905.

II.E.3. Integrity and Performance Information

Prior to making an assistance agreement award where the Federal share is expected to exceed the simplified acquisition threshold, as defined in 2 CFR 200.88, over the period of performance, the Federal awarding agency is required to review and consider any information about the applicant that is available in the Federal Awardee Performance and Integrity Information System (FAPIIS).

An applicant organization may review FAPIIS, accessible through SAM, and submit comments to FAPIIS on any information about the organization that a Federal awarding agency previously entered and is currently available in FAPIIS.

The Federal awarding agency will consider any comments by the applicant, in addition to other information in the designated integrity and performance system, in making a judgment about the applicant's integrity, business ethics, and record of performance under Federal awards when determining a recipient's qualification prior to award, according to the qualification standards of the Department of Defense Grant and Agreement Regulations (DoDGARs), Section 22.415.

II.E.4. Anticipated Announcement and Federal Award Dates

All application review dates and times are indicated in [Section I, Overview of the Funding Opportunity](#).

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.

II.F. Federal Award Administration Information

II.F.1. Federal Award Notices

Awards supported with FY20 funds are anticipated to be made no later than September 30, 2021. Refer to the General Application Instructions, Appendix 2, for additional award administration information.

After email notification of application review results through eBRAP, and if selected for funding, a representative from USAMRAA will contact the Business Official authorized to negotiate on behalf of the PI's organization.

Pre-Award Costs: An institution of higher education, hospital, or other non-profit organization may, at its own risk and without the Government's prior approval, incur obligations and expenditures to cover costs up to 90 days before the beginning date of the initial budget period of a new award. Refer to the General Application Instructions, Section III.B.

Only an appointed USAMRAA Grants Officer may obligate the Government to the expenditure of funds. No commitment on the part of the Government should be inferred from discussions with any other individual. **The award document signed by the Grants Officer is the official authorizing document.**

Federal Government Organizations: Funding made to Federal Government organizations (to include intramural DoD organizations) will be executed through the Military Interdepartmental Purchase Request (MIPR) or Funding Authorization Document (FAD) process. Transfer of funds is contingent upon appropriate safety and administrative approvals. Intramural applicants and collaborators are reminded to coordinate receipt and commitment of funds through their respective Resource Manager/Task Area Manager/Comptroller or equivalent Business Official.

II.F.1.a. PI Changes and Award Transfers

Changes in PI and an organizational transfer of an award are discouraged and will be evaluated on a case-by-case basis and only allowed at the discretion of the USAMRAA Grants Officer.

An organizational transfer of an award will not be allowed in the last year of the (original) period of performance or any extension thereof.

Refer to the General Application Instructions, Appendix 2, Section B, for general information on organization or PI changes.

II.F.2. Administrative and National Policy Requirements

Applicable requirements in the DoDGARs found in 32 CFR, Chapter I, Subchapter C, and 2 CFR, Chapter XI, apply to grants and cooperative agreements resulting from this Program Announcement.

Refer to the General Application Instructions, Appendix 2, for general information regarding administrative requirements.

Refer to the General Application Instructions, Appendix 5, for general information regarding national policy requirements.

Refer to full text of the latest [DoD R&D General Terms and Conditions](#); the [General Research Terms and Conditions with Institutions of Higher Education, Hospitals, and Non-Profit Organizations: Addendum to the DoD R&D General Terms and Conditions](#); and the [USAMRAA General Research Terms and Conditions with For-Profit Organizations](#) for further information.

II.F.3. Reporting

Refer to the General Application Instructions, Appendix 2, Section A, for general information on reporting requirements. *If there are technical reporting requirement delinquencies for any existing USAMRAA-sponsored awards at the applicant organization, no new awards will be issued to the applicant organization until all delinquent reports have been submitted.*

Annual progress reports as well as a final progress report will be required.

The Award Terms and Conditions will specify if more frequent reporting is required.

Award Expiration Transition Plan: An Award Expiration Transition Plan must be submitted with the final progress report. Use the one-page suggested template “Award Expiration Transition Plan,” available on the eBRAP “Funding Opportunities & Forms” web page (<https://ebrap.org/eBRAP/public/Program.htm>) under the “Progress Report Formats” section. The Award Expiration Transition Plan must outline if and how the research supported by this award will progress and must include source(s) of funding, either known or pending.

Awards resulting from this Program Announcement will incorporate additional reporting requirements related to recipient integrity and performance matters. Recipient organizations that have Federal contract, grant, and cooperative agreement awards with a cumulative total value greater than \$10,000,000 are required to provide information to FAPIIS about certain civil, criminal, and administrative proceedings that reached final disposition within the most recent 5-year period and that were connected with performance of a Federal award. Recipients are required to disclose, semiannually, information about criminal, civil, and administrative proceedings as specified in the applicable Representations (see General Application Instructions, Appendix 5, Section B).

II.G. Federal Awarding Agency Contacts

II.G.1. CDMRP Help Desk

Questions related to Program Announcement content or submission requirements as well as questions related to the pre-application or intramural application submission 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

II.G.2. Grants.gov Contact Center

Questions related to extramural 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; International 1-606-545-5035

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 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.

II.H. Other Information

II.H.1. Program Announcement and General Application Instructions Versions

Questions related to this Program Announcement should refer to the Program name, the Program Announcement name, and the Program Announcement version code 501d. The Program Announcement numeric version code will match the General Application Instructions version code 501.

II.H.2. Administrative Actions

After receipt of applications, the following administrative actions may occur:

II.H.2.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.
- The PI, collaborator(s), or their organization(s) are identified or referenced in the Project Narrative, Supporting Documentation, Technical or Lay Abstracts, Relevance to Military Health Statement, or Impact Statement.
- Use of “I,” “we,” “our,” “this organization,” or similar phrases that refer to the PI, 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, collaborator(s), or their organization(s).

II.H.2.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.

II.H.2.c. Withdrawal

The following may result in administrative withdrawal of the application:

- An FY20 PRMRP Programmatic Panel 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 FY20 PRMRP Programmatic Panel members can be found at <https://cdmrp.army.mil/prmrp/panels/panels20>.*
- The application fails to conform to this Program Announcement description.
- 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).
- To preserve the integrity of its peer and programmatic review processes, the CDMRP discourages inclusion of any employee of its review contractors having any role in the preparation, research or other duties for submitted applications. For FY20, the identities of the peer review contractor and the programmatic review contractor may be found at the CDMRP website (<https://cdmrp.army.mil/about/2tierRevProcess>). Applications that include names of personnel from either of these companies may be administratively withdrawn.
- Personnel from applicant or collaborating organizations are found to have contacted persons involved in the review or approval process to gain protected evaluation information or to influence the evaluation process.
- Applications from extramural organizations, including non-DoD Federal agencies, received through eBRAP may be withdrawn.
- Applications submitted by an intramural DoD organization may be withdrawn if the intramural organization cannot coordinate the use of contractual, assistance, or other appropriate agreements to provide funds to extramural collaborators.
- The proposed research project does not address at least one of the Congressionally directed FY20 PRMRP Topic Areas.
- Submission of the same research project to different funding opportunities within the same program and fiscal year. Refer to [Section II.D, Application and Submission Information](#), for exceptions.

- A clinical trial is proposed.

II.H.2.d. Withhold

Applications that appear to involve research misconduct will be administratively withheld from further consideration pending organizational investigation. The organization 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.

II.H.3. Application Submission Checklist

Application Components	Action	Completed
SF424 Research & Related Application for Federal Assistance (extramural submissions only)	Complete form as instructed	
Summary (Tab 1) and Application Contacts (Tab 2) (intramural submissions only)	Complete tabs as instructed	
Attachments	Project Narrative: Upload as Attachment 1 with file name "ProjectNarrative.pdf"	
	Supporting Documentation: Upload as Attachment 2 with file name "Support.pdf"	
	Technical Abstract: Upload as Attachment 3 with file name "TechAbs.pdf"	
	Lay Abstract: Upload as Attachment 4 with file name "LayAbs.pdf"	
	Statement of Work: Upload as Attachment 5 with file name "SOW.pdf"	
	Impact Statement: Upload as Attachment 6 with the file name "Impact.pdf"	
	Relevance to Military Health Statement: Upload as Attachment 7 with the file name "MilRel.pdf"	
	Letters of Support: Upload as Attachment 8 with the file name "Letters.pdf"	
	Equipment List: Upload as Attachment 9 with file name "Equipment.pdf" if applicable	
	Representations (extramural submissions only): Upload as Attachment 10 with file name "RequiredReps.pdf" if applicable	
	Suggested Collaborating DoD Military Facility Budget Format: Upload as Attachment 11 with file name "MFBudget.pdf" if applicable	
Research & Related Personal Data	Complete form as instructed	

Application Components	Action	Completed
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 (extramural submissions only)	Complete as instructed. Attach Budget Justification (BudgetJustification.pdf) to the appropriate field	
Budget (intramural submissions only)	Suggested DoD Military Budget Format, including justification	
Project/Performance Site Location(s) Form	Complete form as instructed	
Research & Related Subaward Budget Attachment(s) Form, if applicable	Complete form as instructed	

APPENDIX 1: ACRONYM LIST

ACURO	Animal Care and Use Review Office
ARDS	Acute Respiratory Distress Syndrome
B	Billion
CDMRP	Congressionally Directed Medical Research Programs
CFR	Code of Federal Regulations
CPAP	Continuous Positive Air Pressure
DHA	Defense Health Agency
DHP	Defense Health Program
DoD	Department of Defense
DoDGARs	Department of Defense Grant and Agreement Regulations
DUNS	Data Universal Numbering System
eBRAP	Electronic Biomedical Research Application Portal
EC	Ethics Committee
ET	Eastern Time
FAD	Funding Authorization Document
FAPIIS	Federal Awardee Performance and Integrity Information System
FDA	U.S. Food and Drug Administration
FH	Familial Hypercholesterolemia
FY	Fiscal Year
FXPOI	Fragile X-Associated Primary Ovarian Insufficiency
FXTAS	Fragile X-Associated Tremor/Ataxia Syndrome
GMP	Good Manufacturing Practice
HBOC	Hemoglobin-Based Oxygen Carrier
HIV	Human Immunodeficiency Virus
HRPO	Human Research Protection Office
IACUC	Institutional Animal Care and Use Committee
IgE	Immunoglobulin E
IRB	Institutional Review Board
LOI	Letter of Intent
M	Million
ME/CFS	Myalgic Encephalomyelitis/Chronic Fatigue Syndrome
MIPR	Military Interdepartmental Purchase Request
OASD(HA)	Office of the Assistant Secretary of Defense for Health Affairs
ORCID	Open Researcher and Contributor ID, Inc.
ORP	Office of Research Protections
PI	Principal Investigator
PRMRP	Peer Reviewed Medical Research Program
RDT&E	Research, Development, Test, and Evaluation
SAM	System for Award Management
SMN	Survival Motor Neuron
SOW	Statement of Work

STEM	Science, Technology, Engineering, and/or Mathematics
UEI	Unique Entity Identifier
URL	Uniform Resource Locator
USAMRAA	U.S. Army Medical Research Acquisition Activity
USAMRDC	U.S. Army Medical Research and Development Command
USC	United States Code
VA	Department of Veterans Affairs

APPENDIX 2: AREAS OF ENCOURAGEMENT

Applications addressing any of the FY20 PRMRP Topic Areas are of interest to the program. ***Any aspect of research relevant to one or more FY20 PRMRP Topic Areas may be considered for funding.*** Areas of Encouragement related to each FY20 PRMRP Topic Area have been identified by the DoD, VA, and other relevant stakeholders and are listed below under each Topic Area. Applicants are urged to read and consider these Areas of Encouragement before preparing their applications. ***The information provided is not exhaustive, and applicants are not restricted to submitting applications that address an Area of Encouragement on this list.***

Arthritis (other than [Rheumatoid Arthritis](#), which is a separate Topic Area listed below)

- Research quantifying the impacts of obesity, weight loss, physical fitness (all components, e.g., cardiovascular, strength, flexibility, balance), and dietary factors on the development of or prevention/risk reduction of arthritis.
- Basic and translational research to identify treatments to mitigate and/or reverse osteoarthritis.
- Research to establish activity recommendations for maximal joint life following joint repair, particularly in young patient populations.
- Development or validation of innovative regenerative rehabilitation approaches for preventing or mitigating arthritis.
- Intra-articular treatments that offer sustained (two or more months) relief of symptoms and/or disease-modifying effects.
- Research on therapies that target multiple phases of the cellular response pathways that are implicated in the development of arthritis, including cell death, inflammation, matrix changes, and changes in metabolic responses.
- Identification and/or validation of diagnostic biomarkers that can serve as surrogate endpoints.

Burn Pit Exposure

- Research on the etiology and treatment of adverse health events associated with exposure to airborne hazards and/or open burn pits during deployment.
- Toxicological studies to characterize emissions from open air burns, burn boxes, incinerators, and simulated burn pits to ascertain the toxicity and mechanisms of action of such chemicals and airborne environmental dust and mixtures, as well as interactions among pollutants and particulate materials.
- Identification and validation of biomarkers, particularly from the lung microbiome, of both exposure to and health effects of burn pit combustion products, burning biomass and refuse, and geogenic dusts.

- Development and validation of sensors/instruments for assessing (including in real time) area and/or individual levels of exposure to airborne hazards for use in research and for occupational and environmental exposure monitoring.

Chronic Migraine and Post-Traumatic Headache

- Precision medicine research to identify and validate biomarkers to diagnose and monitor traumatic brain injury patients with chronic migraine or post-traumatic headache and to characterize individual responses to treatment.
- Epidemiological/natural history studies to characterize specific types of post-traumatic headache and chronic migraine, the pathobiology of these headaches, and the risk factors/exposure conditions that might predispose people to certain types of post-traumatic headache and chronic migraine.
- Research on the optimal approaches to effective management of acute and chronic pain and co-occurring psychological health disorders for chronic migraine and post-traumatic headache, with a focus on assessing and eliminating adverse outcomes and decreasing polypharmacy.
- Evaluation of the efficacy of existing or emerging pharmaceutical interventions (non-opioid), as well as evaluation of mechanical stimulation and/or other non-pharmaceutical interventions, for the treatment of chronic migraine and post-traumatic headache.
- Evaluation of the differences in etiology, diagnosis, treatment plan, and prevention of migraine headaches between men and women.

Congenital Heart Disease

- Development of approaches, including regenerative medicine, that provide structural support, restore native activity, allow for tissue growth, and prevent the need for reoperation.
- Population-based or outcomes-based research to assess the health outcomes of individuals with congenital heart disease across their life spans.
- Research to improve understanding of the causes of congenital heart defects, including genomic, proteomic, and metabolomic profiling.
- Research to design and implement improved or novel models (in vitro or in vivo) with an established phenotype to increase the efficacy of discovering drug targets, screening existing drugs, performing cardiotoxicity testing, or uncovering pathogenesis.
- Research both on the risk of neurologic injury and on enhanced neuroprotection before, during, and after surgery for congenital heart disease.

Constrictive Bronchiolitis

- Research to understand the role of occupational and environmental exposures, including military-relevant volatile compounds, toxic industrial chemicals/materials in dense urban

environments, and airborne particulates, such as mineral and soil dusts, in the etiology of constrictive bronchiolitis.

- Research to determine the prevalence and severity of constrictive bronchiolitis and related respiratory diseases in previously deployed military Service members and/or Veterans.
- Studies on the etiology of vaping-induced constrictive bronchiolitis.
- Development and testing of minimally invasive or non-invasive approaches for diagnosing constrictive bronchiolitis.
- Research to develop novel and/or innovative therapeutics to modify the progression of constrictive bronchiolitis.
- Development and/or validation of animal models for understanding mechanisms and etiology of constrictive bronchiolitis.

Diabetes

- Identification and/or evaluation of interventions to reduce metabolic dysregulation and the development of diabetes among individuals meeting the clinical criteria for prediabetes.
- Research on interventions to prevent or treat diabetes complications, including diabetic retinopathy, nephropathy, neuropathy, cardiomyopathy, and impaired wound healing.
- Research to better understand the heterogeneity of diabetes including the identification of novel biomarkers (especially the metabolomics biomarkers that are common between diabetes and post-traumatic stress disorder).
- Research on the transplantation of allogenic or autologous pancreatic islet cells for long-term natural insulin production, including current good laboratory/clinical/manufacturing practices (as needed) for cell line development.
- Research to design and implement improved or novel models (in vitro or in vivo) to model pancreatic islets to uncover pathogenesis and improve the efficiency of drug discovery.
- Development of an implantable biosensor system for glucose detection in real time.

Dystonia

- Research to improve identification of delayed onset dystonia following traumatic brain injury.
- Research on interventions to prevent, slow the progression of, or treat dystonia.
- Studies into the natural history, genetics, and/or neurobiology of dystonia.
- Research to identify the relationship between specific molecular/genetic changes and circuitry/network alterations in dystonia.

- Identification and development of novel research tools (such as cellular models, phenotypic models, etc.) to aid dystonia research.

Eating Disorders

- Studies on the pathophysiological consequences of eating disorders, including effects on organ functions and metabolic processes.
- Assessment of patterns of comorbidity between eating disorders and other mental health conditions, including an examination of whether eating disorders are more likely to precede or follow the development of other mental health conditions.
- Studies to identify the most effective treatment or preventive strategies for patients with an eating disorder and a comorbid disorder.
- Research to advance the understanding of the biological, genetic, lifestyle, and environmental factors that influence eating disorders.
- Investigations into the prevalence, diagnosis, risk factors, and treatment patterns of eating disorders.

Emerging Viral Diseases

- Surveillance and predictive modeling tools that leverage artificial intelligence approaches to predict outbreaks and epidemics and support strategies for mitigating the threat of **emerging viral diseases** as defined by the National Institute of Allergy and Infectious Diseases.¹
- Research and development of in silico and/or in vitro tools to assess product manufacturability/developability, efficacy, and toxicity, such as cells-on-a-chip and 3D tissue modeling, to support development of medical countermeasures.
- Development of a wearable sensor that provides real-time diagnostics of emerging viral diseases to predict illness before onset of symptoms.
- Rapid prediction of protective antigens/epitopes and testable correlates of protection on emerging or novel pathogens.
- Development of a highly sensitive diagnostic system for use at the point of injury that provides early diagnosis of infection prior to the onset of classical symptoms.
- Research, development, and validation of animal models for the study of emerging viral diseases that clearly show the pathophysiological mechanism of the disease and provide translational data to advance drug products to human clinical trials.
- Development of risk assessment strategies for vector-borne diseases and novel interventions for vector control, including but not limited to novel insecticides, larvicide applications, and barrier methods.

¹ <https://www.niaid.nih.gov/research/emerging-infectious-diseases-pathogens>

Endometriosis

- Research to elucidate the underlying pathogenesis, evolution, pathophysiology, and progression of endometriosis. (How does it start, why does it start, and why does it get so bad in some women?)
- Improve detection and diagnosis of endometriosis through non-invasive techniques.
- Development of novel treatments, including non-opioid pain therapies, or alternative therapies to alleviate symptoms and reduce progression and secondary effects of endometriosis such as pain, scarring, and infertility.
- Research to identify risk factors for subsequent cancer development, such as endometrioid and clear cell ovarian cancer.
- Research to optimize surgical techniques that improve fertility in endometriosis patients and reduce progression and symptoms of disease.

Epidermolysis Bullosa

- Research, including clinical trials, focused on therapeutics (topical or systemic) or dressings that enhance wound healing in inherited epidermolysis bullosa.
- Development of novel therapeutics to reduce epidermolysis bullosa symptoms, improve quality of life, or lead to a cure.
- Research to provide further insight into those cellular pathways that promote the development of squamous cell carcinomas in recessive dystrophic and junctional epidermolysis bullosa.
- Research, including randomized controlled clinical trials, focused on systemic drugs that prevent, delay the onset, or modify the aggressiveness of squamous cell carcinoma in patients with recessive dystrophic and junctional epidermolysis bullosa.

Familial Hypercholesterolemia

- Research to improve early diagnosis of familial hypercholesterolemia (FH) and the implementation of diagnostic tools, including in the pediatric population.
- Development of evidence-based approaches for risk stratification to understand FH disease progression and comorbidities (e.g., early onset cardiovascular disease and coronary artery disease), including panomic (genomics, proteomics, metabolomics, transcriptomics, and clinical data) studies to identify and evaluate polygenic risk factors.
- Research to understand the approaches to clinical management to treat FH patients at higher risk for progressing to clinical atherosclerotic cardiovascular disease.
- Studies to identify social and/or biological disparities in diagnosis and treatment and how they affect risk.
- Gene editing or gene therapy studies addressing monogenic causes of FH.

- Studies to systematically identify individuals at risk for FH using machine learning tools.

Fibrous Dysplasia

- Research to better understand the underlying pathophysiology of fibrous dysplasia, including elucidating any genetic and cellular signaling factors that contribute to pathogenesis.
- Research that explores the prevention of lesion development or expansion in adolescents, or the development of implants that accommodate adolescent growth.
- Research to develop or better characterize animal models of fibrous dysplasia to assist in understanding disease pathogenesis, discover relevant biomarkers, or evaluate therapeutic efficacy.
- Research to discover and explore novel effective therapies for fibrous dysplasia outside of surgical interventions.
- Development of novel diagnostic tools for early and accurate detection of fibrous dysplasia.
- Development of improved treatments and preventive care for fibrous dysplasia in adolescent populations.

Focal Segmental Glomerulosclerosis

- Development of a curative therapy or treatments to delay or halt the progression of focal segmental glomerulosclerosis and/or prevent post-transplantation recurrence.
- Research to improve understanding of the causes of primary and/or secondary focal segmental glomerulosclerosis, including genetic mutations, lifestyle factors, or comorbidities.
- Development of non-invasive methods to diagnose focal segmental glomerulosclerosis and its variants, especially in newborn or pediatric diagnostics for early detection and intervention.
- Research to determine the efficacy of medications used off-label (outside the U.S. Food and Drug Administration [FDA]-approved indication) to treat focal segmental glomerulosclerosis.
- Development of surrogate endpoints to accelerate approval of new treatments.

Food Allergies

- Studies to investigate the role of immunoglobulin E (IgE) in the development or treatment of food allergies.
- Studies to determine the role of maternal diet on the incidence of food allergies in children.
- Research to understand the impact of environment (urban versus rural) on the incidence and type of food allergy.

- 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 understand the link between the food-processing techniques and food allergies.

Fragile X

- Development and evaluation of gene modification (e.g., gene editing or gene reactivation) therapeutics for the treatment of fragile X syndrome (including fragile X-associated tremor/ataxia syndrome [FXTAS] and fragile X-associated primary ovarian insufficiency [FXPOI]).
- Identification and validation of functional measures of the manifestations of fragile X syndrome (including FXTAS and FXPOI) across the life span.
- Research to advance the understanding of the pathophysiology/natural history or life course of fragile X syndrome (including FXTAS and FXPOI).
- Identification of novel targets and/or testing novel or existing therapeutics (e.g., repurposing drugs) for fragile X syndrome (including FXTAS and FXPOI).
- Research to establish the benefits of early diagnosis/early treatment of fragile X syndrome in patients and progeny.
- Development of a preclinical model that is representative of human fragile X syndrome.

Frontotemporal Degeneration

- Basic research to establish in vivo and in vitro models or research tools for disease pathology, behavioral/cognitive symptoms, and motor dysfunction for sporadic and/or genetic syndromes.
- Research to understand the neurological basis of deficits in social cognition and emotional regulation.
- Research to improve diagnostics of and/or prognostics for frontotemporal degeneration and related proteinopathies.
- Research to identify risk factors (e.g., gene or epigenetic networks, environmental factors, and family history of neurodegeneration or autoimmune disorders).
- Development/advancement of evidence-based treatments (including pharmacological and non-pharmacological) for frontotemporal degeneration and associated symptoms.

Guillain-Barré Syndrome

- Research on the immunologic pathways and molecular mechanisms responsible for the pathology of Guillain-Barré syndrome.

- Research to elucidate the characteristics of various exposures (e.g., viruses, bacteria, vaccinations, surgery, and trauma) associated with Guillain-Barré syndrome and how they interact with host processes.
- Research to prevent or reduce the effects of residual weakness, relapse of muscle weakness, and other neurological and psychological symptoms of Guillain-Barré syndrome to improve patients' quality of life and increase their independence.
- Development of a rapid diagnostic test for Guillain-Barré syndrome.
- Development of new treatments and refinement of existing treatments for Guillain-Barré syndrome.

Hemorrhage Control

- Development of new and innovative capabilities to stop non-compressible intracavitary hemorrhage as well as improved technologies to stop junctional and pelvic bleeding in pre-hospital environments.
- Development of innovative damage control resuscitation and damage control surgical and non-surgical capabilities, especially interventions to be used in an austere environment by non-physician providers.
- Research on strategies for early (e.g., pre-hospital) detection (especially internal bleeding) and treatment for hemorrhage, coagulopathy of trauma, and hemodynamic decompensation/hypovolemic shock.
- Research on novel or engineered blood products that offer physiological, logistical, or cost advantages over current products. Hemoglobin-based oxygen carrier (HBOC) research should address nitric oxide scavenging.
- Research on adjunctive pharmacological solutions for hemorrhage, shock, coagulopathy, transfusion, and/or the stabilization of polytrauma, with attention to the impact on potential traumatic brain injury.
- Research to evaluate the effects of current combat blood product transfusion guidelines on immunological status and clinical outcomes.

Hepatitis B

- Impact of co-infection with hepatitis C or human immunodeficiency virus (HIV) on hepatitis B pathogenesis.
- Research on strategies to reduce vertical (mother-to-child) transmission of hepatitis B.
- Development of strategies for reliable, non-invasive, early detection of hepatitis-related liver disease and hepatocellular carcinoma.
- Research on strategies to promote reversal of liver fibrosis and/or assess the associated clinical and pathological outcomes.

- Clinical studies to evaluate combination or curative therapies for treatment of hepatitis B infection.

Hydrocephalus

- Research on the etiology, prevention, diagnosis, and treatment of post-traumatic hydrocephalus.
- Discovery or validation of novel and/or innovative therapies and therapeutic targets for the treatment of hydrocephalus and its sequelae, including therapies directed at myelin regeneration and repair.
- Development or validation of biomarkers and imaging techniques, particularly multimodal approaches, to aid in diagnosis, prognosis, and monitoring of therapeutic efficacy.
- Research on the prevention of shunt failure or the development of novel shunt technologies.
- Development or validation of improved hydrocephalus model systems.

Immunomonitoring of Intestinal Transplants

- Studies to elucidate the contribution of the mucosal immune system, other host-derived factors, or gut microbiota-derived factors on intestinal transplant viability and improving outcomes.
- Development and evaluation of evidence-based intestinal transplant strategies that focus on dampening the immune response against intestinal transplants or circumventing the induction of immunity against the transplant.
- Development and evaluation of implant-associated materials (e.g., scaffolds) with anti-inflammatory properties that protect the intestinal transplant from immune attack.
- Studies to improve immunomonitoring of recipient immune responses after intestinal transplantation, with a focus on prospective leukocyte profiling, to aid in diagnosis and treatment of immunological and immunosuppression-related complications.
- Development and/or validation of precise, real-time implanted monitoring devices to improve individualized patient outcomes after intestinal transplantation.

Inflammatory Bowel Diseases

- Studies directed toward understanding how acute enteric infections may trigger chronic inflammatory bowel diseases, including studies aimed at elucidating the interactions between chronic/post-traumatic stress and infection that may provoke inflammatory bowel disease.
- Studies that leverage genomic, metabolomic, microbiomic, immunological, and systems biology approaches to prevent or treat inflammatory bowel disease (especially inflammatory bowel diseases associated with acute enteric infection).

- Studies to elucidate pathological processes involved in inflammatory bowel disease-related complications, such as strictures or primary sclerosing cholangitis, or progression to cancer with the goal of prevention or treatment.
- Research on the role of diet in the development and progression of inflammatory bowel diseases.
- Research on treatment strategies for patients with inflammatory bowel diseases to include, but not limited to, microbiome-related and those that target epithelial health and function strategies, including those who are refractory to standard care.

Interstitial Cystitis

- Identification and validation of biomarkers for making a definitive diagnosis of interstitial cystitis.
- Evaluation and assessment of novel and/or innovative treatment options for interstitial cystitis patients, including intravesical therapy.
- Validation of existing and/or identification of novel prevention measures for interstitial cystitis/bladder pain syndrome, including those that could be utilized in an operational environment.
- Research on the etiology and pathogenesis of interstitial cystitis to inform targeted therapy development.

Metals Toxicology

- Identification and validation of biomarkers to evaluate military Service members' acute exposure to toxic metals in an operational environment and predict potential consequent health risks and associated health outcomes.
- Understanding the effects of metals exposure on medical treatment and patient outcomes of the injured Warfighter.
- Retrospective studies to evaluate risks and exposure to toxic metals among workers at industrial facilities.
- Research on the toxicity of metal combinations and the interaction between different metal components.
- Research on the toxicity of metal-based engineered nanomaterials, including those used in military applications.
- Development of microsurgical techniques to remove embedded toxic metals.
- Evaluating the long-term effects of exposure to micro/airborne/aerosolized or non-removable embedded toxic metals.

Mitochondrial Disease

- Research on novel and/or innovative treatments to alleviate symptoms or slow down the progression of mitochondrial diseases.
- Research to better understand the progression of mitochondrial diseases.
- Identification and testing of non-invasive techniques and biomarkers to monitor mitochondrial function, aid in clinical diagnosis, and/or evaluate therapeutic efficacy.
- Development of improved tools and animal models to study primary mitochondrial diseases and evaluate therapeutics.
- Development of tools and methodologies to assess mitochondrial heteroplasmy on a cellular, tissue, and organ level.
- Development of tools to distinguish whether mitochondrial dysfunction is inherited or acquired.

Musculoskeletal Health

- Research on physical resilience of the musculoskeletal system for the prevention and treatment of musculoskeletal disorders such as load carriage capability, effectiveness of physical training and treatments, and effective use of exoskeleton technology.
- Research to increase the understanding of and to improve diagnosis, prevention, and/or treatment of chronic overuse musculoskeletal disorders.
- Research on back pain treatment and/or management strategies to prevent surgery and recurrence of symptoms, identify factors that predict optimal treatment response for different patients, and encourage self-management.
- Research to develop diagnostic tools or increase the understanding of the cause, prevention, and/or treatment of compartment syndrome, sarcopenia/cachexia, or other skeletal muscle-specific diseases and conditions.
- Research to explore the effects of prolonged weightlessness, microgravity, and radiation exposure associated with space travel on musculoskeletal tissues.
- Research to better understand tissue-specific diseases or injuries (e.g., bone, cartilage, tendon, and/or muscle) with a focus on treatment, recovery, or regeneration.

Myalgic Encephalomyelitis/Chronic Fatigue Syndrome

- Development and testing of treatments or preventive measures for myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS).
- Research to understand the mechanisms underlying ME/CFS.
- Epidemiological research to understand the link between medical history and ME/CFS.

- Research to identify biomarkers to diagnose and test potential therapeutics for ME/CFS.

Myotonic Dystrophy

- Research on the role of epigenetic factors in the onset, progression, and/or severity of myotonic dystrophy in relevant animal models or patients.
- Research into the mechanisms of expanded CTG or CCTG repeat instability in somatic or germ line cells in myotonic dystrophy.
- Identification of biomarkers that can be detected through minimally invasive means to signal early changes in the progression of myotonic dystrophy.
- Development and/or testing of novel and/or innovative treatments, including those utilizing gene editing or silencing.
- Clinical research into the natural history of myotonic dystrophy in order to understand disease progression and develop/validate clinical trial endpoint measures across the multiple organ systems involved in the disease.

Nutrition Optimization

- Development or validation of nutrition-based strategies that mitigate the consequences of environmental and/or physiological stressors.
- Development of prolonged nutrition care using oral and/or intravenous approaches including precision nutrition care following injury or illness.
- Research on the impact of the use of nutrition strategies or dietary supplements on physical or cognitive performance.
- Development or validation of improved nutrition strategies to enhance and sustain performance in operational environments and resource-limited settings.
- Research to develop strategies to apply metabolomics to optimize individual nutrition and the development of tools or devices to monitor nutritional intake at an individual level.
- Research to study how diet or changes to the gut microbiome impact brain health.

Pancreatitis

- Development and testing of novel therapeutics for pancreatitis.
- Research on the basic biology and physiology of the pancreas to better understand the etiology and pathology of pancreatitis.
- Research to improve understanding and management of complications of pancreatitis.

Pathogen-Inactivated Blood Products

- Development and validation of next-generation technologies and/or devices to reduce the production time, increase portability, decrease weight, or develop unpowered technologies for pathogen reduction/inactivation in whole blood.
- Research on lyophilization of pathogen-reduced/-inactivated blood products and derivatives (platelets, plasma, red cells, cryoprecipitate, coagulation factors, etc.).
- Development and advancement of technologies to improve the safety of blood products to include pathogen reduction/inactivation in whole blood for military/civilian blood donor centers and blood banks that meet the requirements for FDA licensure in support of domestic and global contingency/combat operations.
- Expansion and validation of the library of blood-borne pathogens that are reduced/inactivated to include emerging pathogens, genetically modified pathogens, and pathogens designed for biological warfare.
- Advancement in pathogen reduction technology to further improve the log-kill reduction for known blood-borne pathogens (e.g., hepatitis B, hepatitis C, cytomegalovirus, Korean hemorrhagic fever virus, Bunyaviruses, HIV, Rift Valley fever virus, malaria, *Trypanosoma cruzi* and *T. brucei*, Ebola virus, West Nile virus, dengue virus, chikungunya virus, Zika virus).
- Research studies, including clinical trials, to further characterize the effects of pathogen reduction technologies in blood products (e.g., whole blood, platelets, plasma, and cryoprecipitate).

Plant-Based Vaccines

- Optimize expression and purification systems for plant-based vaccine production.
- Research to demonstrate safety and efficacy of plant-based vaccines, including oral administration of non-purified forms, such as food or feed product.

Polycystic Kidney Disease

- Development of improved treatment strategies for polycystic kidney disease, including approaches to identify and monitor patients at higher risk for progressing to end-stage renal disease.
- Research on the underlying pathobiology and molecular mechanisms of polycystic kidney disease, including studies of genetic factors, cyst formation and growth, the role of cilia, and factors that modify disease progression and/or severity.
- Research on the lifestyle factors or comorbidities that may modify the progression of polycystic kidney disease.
- Development of surrogate endpoints to accelerate approval of new treatments.

Pressure Ulcers

- Strategies to prevent or reduce the formation of pressure ulcers during prolonged immobilization of casualties in a pre-hospital environment (e.g., spinal cord injuries) or long-range transport/aeromedical evacuation.
- Development of novel detection methodologies for determining early formation of pressure ulcers.
- Novel strategies for the treatment of pressure ulcers, including the mitigation of progression to advanced stages.
- Research on novel synthetic production, delivery, and adhesion methodologies leading to permanent closing of pressure ulcers.
- Development of novel wound healing strategies.

Pulmonary Fibrosis

- Development and/or testing of novel and/or innovative treatments, including precision medicine approaches, to delay or modify the progression of pulmonary fibrosis.
- Identification of biomarkers of pulmonary injury or early predictors of interstitial lung disease.
- Development and/or validation of improved tools and animal models (excluding mice) to study pulmonary fibrosis and evaluate therapeutics.
- Research into the pathobiology and molecular mechanisms underlying the development and progression of pulmonary fibrosis.
- Retrospective studies to determine the risk and incidence of pulmonary fibrosis among military Service members and/or Veterans.

Resilience Training

- Research on interventions to build resilience to physical, psychological, environmental, and social stressors.
- Research that measures the efficacy of resilience training approaches.
- Development and validation of tools to measure physical or psychological resilience.
- Research aimed at understanding the relationship between resilience and successful/ unsuccessful recovery from injury.
- Research in psychometric training or pharmacological treatment(s) to manage stress within individuals.

Respiratory Health (excluding lung cancer and mesothelioma)

- Research on the etiology and prevention of acute respiratory distress syndrome (ARDS) caused by host responses to trauma, transfusion, mechanical ventilation, burns, infection, hemorrhagic shock, inhalation, and/or oxygen exposure.
- Development of improved methods for assessing and treating lung injury due to chemical, smoke, inhalation burn, or high-dose radiation exposure.
- Strategies to stabilize and support the safe transport of patients with ARDS in order to optimize therapeutic interventions, particularly in operational scenarios requiring prolonged or extended care and/or longer transport times prior to definitive care.
- Development of novel emergency airway management devices/adjuncts such as cricothyrotomy kits, airway insertion equipment, and especially combination airway devices (e.g., suction integrated airways and endotracheal plus esophageal tube).
- Novel and/or innovative detection technologies or therapeutics to reduce the incidence and/or severity of ARDS and/or other lung injury secondary to trauma, transfusion, mechanical ventilation, infection, burns, hemorrhagic shock, inhalation, and/or oxygen exposure.
- Studies to identify the prevalence and associated morbidity and mortality of blast overpressure, including combined overpressure and burn/lung injury.
- Research on the causes, treatment, and prevention of obstructive pulmonary diseases (e.g., chronic obstructive pulmonary disease and bronchiectasis), including identification and validation of biomarkers and disease phenotypes, as well as employing personalized medicine in clinical research and disease management.
- Development of biomarker metrics to associate the long-term health outcomes of ARDS with degradation of physiological and physical performance.
- Research on airborne chemical and pollution hazards that affect lung function associated with specific acute health outcomes for first responders or deployed Service members.

Rheumatoid Arthritis

- Research to better understand the relationship between genetic risk, environmental exposures, and triggers in developing rheumatoid arthritis.
- Studies that identify or validate biomarkers or personalized medicine strategies that allow for individualized medication choice based on the patient's underlying biology or disease state.
- Research on the long-term use of immunosuppressive and other therapies in patients with rheumatoid arthritis.
- Research to better characterize and understand the preclinical disease stage of rheumatoid arthritis for early diagnosis and treatment.
- Research on management of comorbidities, including biopsychosocial outcomes, for patients with rheumatoid arthritis.

- Research to establish activity recommendations following joint replacement for maximal joint life.

Sleep Disorders and Restriction

- Research on the effects of disrupted normal sleep and circadian rhythms on the physical and psychological health, safety, performance, and productivity of military personnel and civilian populations, including sex differences.
- Identification and/or validation of non-continuous positive air pressure (CPAP)-based treatment regimens that enhance compliance in military personnel and civilian populations.
- Research on the prevention and/or mitigation of sleep disorders due to sleep restriction, particularly associated with long aeromedical evacuation flights for both clinical team members and patients.
- Development and/or testing of non-pharmacological treatments for sleep disorders associated with long-term exposure to enclosed environments (e.g., aircraft, submarines, and/or tanks).
- Research on the precision diagnosis and/or treatment of sleep disorders, especially following traumatic brain injury or related to post-traumatic stress disorder.

Spinal Muscular Atrophy

- Research into molecular and proteomic phenotyping the spinal muscular atrophy disease state.
- Research to determine mitochondrial involvement and astrocytic and other non-neuronal contributions to motor neuron vulnerability.
- Exploration of the form and function of survival motor neuron (SMN)-depleted neuromuscular junctions at ultrastructural (e.g., dysregulation of endocytosis), transcriptomic, and proteomic levels, particularly the mildest SMN reduction that leads to consistent quantifiable motor neuron loss.
- Research to find non-SMN-altering spinal muscular atrophy-modifying genes that may lead to identification of novel and/or innovative therapeutic targets or treatments.
- Research to further understand SMN gene regulation and post-transcriptional mechanisms leading to synergistic SMN-repleting approaches, as well as to determine whether boosting SMN induction maximizes efficacy.

Sustained Release Drug Delivery

- Development of technology platforms or formulations for long-term sustained-release delivery of drugs, especially for radiation pre-exposure prophylaxis, post-traumatic stress

disorder, substance use or abuse, suicidality, pain control, allergies, attention deficit/hyperactivity disorder, and chemoprophylaxis for any condition.

- Development of a sustained drug delivery system for pre-hospital trauma and pain medications for up to 24 hours prior to definitive care, including passive slow release or closed loop feedback delivery solutions.
- Development of a delivery system (including novel good manufacturing practice [GMP]-grade biomaterials) that could accurately deliver prescription and non-prescription medications.
- Development of novel and/or innovative approaches for bioavailable and sustained-release oral formulations of existing broad-spectrum fungicidal, antimicrobial, antiparasitic, and antiviral medications.
- Research into techniques to provide sustained release of drugs in tissue repair applications, such as bone or nerve regeneration or vision restoration.

Vascular Malformations

- Studies into the natural history, genetics, and pathogenesis of vascular malformations, including, but not limited to, lymphatic, capillary, venous, and arteriovenous and hemangiomas.
- Research to develop or improve methods to diagnose and manage vascular malformations, including, but not limited to, lymphatic, capillary, venous, and arteriovenous and hemangiomas.
- Research to discover or develop novel and/or innovative therapeutic targets and treatments to regress or prevent vascular malformations, including, but not limited to, lymphatic, capillary, venous, and arteriovenous and hemangiomas.
- Development of non-invasive or minimally invasive technologies or approaches for the control of internal bleeding, including cerebral arteriovenous malformations, associated with vascular malformations.
- Development of in vivo or in vitro models of vascular malformations for the purpose of identifying novel and/or innovative drug targets, screening existing drugs, and/or elucidating the pathogenesis of the disease.
- Research to understand and diagnose high-risk vascular malformations to prevent severe adverse events.

Women's Heart Disease

- Identification of sex-specific approaches to either develop novel diagnostics and treatments or increase the effectiveness of current practice to improve clinical care of women.
- Research on factors to predict and prevent the long-term impacts of the endocrine system, gestational diabetes, gestational hypertension, menopause, or preeclampsia on the cardiovascular health of women.
- Research on trauma-induced cardiac arrest secondary to hemorrhage and polytrauma in the female population.
- Research focused on elucidating the potential relationship between post-traumatic stress disorder and women's heart disease.
- Studies to determine the risk and incidence of heart disease among female Service members and/or Veterans.
- Research investigating drug-induced arrhythmias.

APPENDIX 3: DOD AND VA WEBSITES

PIs are encouraged to integrate and/or align their research projects with DoD and/or VA research laboratories and programs. Collaboration with DoD or VA investigators is also encouraged. Below is a list of websites that may be useful in identifying additional information about DoD and VA areas of research interest, ongoing research or potential opportunities for collaboration within the FY20 PRMRP Topic Areas.

Air Force Office of Scientific Research

<https://www.wpafb.af.mil/afrl/afosr/>

Air Force Research Laboratory

<https://www.wpafb.af.mil/afrl>

Armed Forces Radiobiology Research Institute

<https://www.usuhs.edu/afri/>

Clinical and Rehabilitative Medicine Research Program

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

Combat Casualty Care Research Program

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

Congressionally Directed Medical Research Programs

<https://cdmrp.army.mil>

Defense Advanced Research Projects Agency

<https://www.darpa.mil/>

Defense Technical Information Center

<https://www.dtic.mil>

Defense Threat Reduction Agency

<http://www.dtra.mil/>

Military Health System Research Symposium

<https://mhsrs.amedd.army.mil/SitePages/Home.aspx>

Military Infectious Diseases Research Program

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

Military Operational Medicine Research Program

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

Naval Health Research Center

<https://www.navy.mil/local/nhrc/>

Navy and Marine Corps Public Health Center

<https://www.med.navy.mil/sites/nmcphc/Pages/Home.aspx>

Office of Naval Research

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

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

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

Telemedicine and Advanced Technology Research Center

<http://www.tatrc.org>

Uniformed Services University

<https://www.usuhs.edu/research>

U.S. Army Institute of Surgical Research

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

U.S. Army Medical Materiel Development Activity

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

U.S. Army Medical Research and Development Command

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

U.S. Army Medical Research Institute of Infectious Diseases

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

U.S. Army Research Institute of Environmental Medicine

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

U.S. Army Research Laboratory

<https://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

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

U.S. Naval Research Laboratory

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

Walter Reed Army Institute of Research

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