CDMRP
DEPARTMENT OF WAR
CONGRESSIONALLY DIRECTED
MEDICAL RESEARCH PROGRAMS

Peer Reviewed Medical Research Program

Advancing Impactful Medical Research in Congressionally Directed Topic Areas

For more information, please visit
cdmrp.health.mil/prmrp

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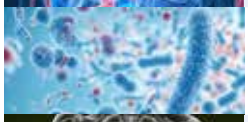
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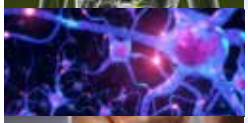
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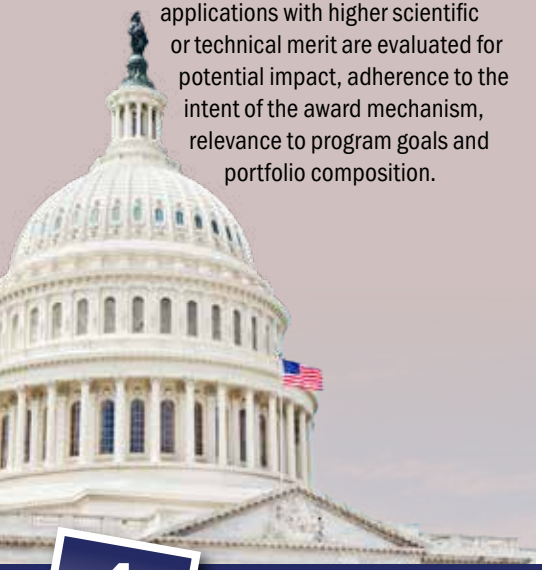
CONGRESSIONALLY DIRECTED MEDICAL RESEARCH PROGRAMS

History:

Congress established the Congressionally Directed Medical Research Programs in response to a grassroots effort in 1992 led by the breast cancer advocacy community. That effort resulted in a congressional appropriation of funds for breast cancer research and initiated a unique partnership among the public, Congress and the military. Since then, Congress appropriated funding for additional targeted research programs. The CDMRP managed over $19.672 billion in congressional special interest funds from inception through fiscal year 2024. Congress provides general intent for each program and specifies funding as part of the annual Department of Defense appropriations bill.

Application Review Process:

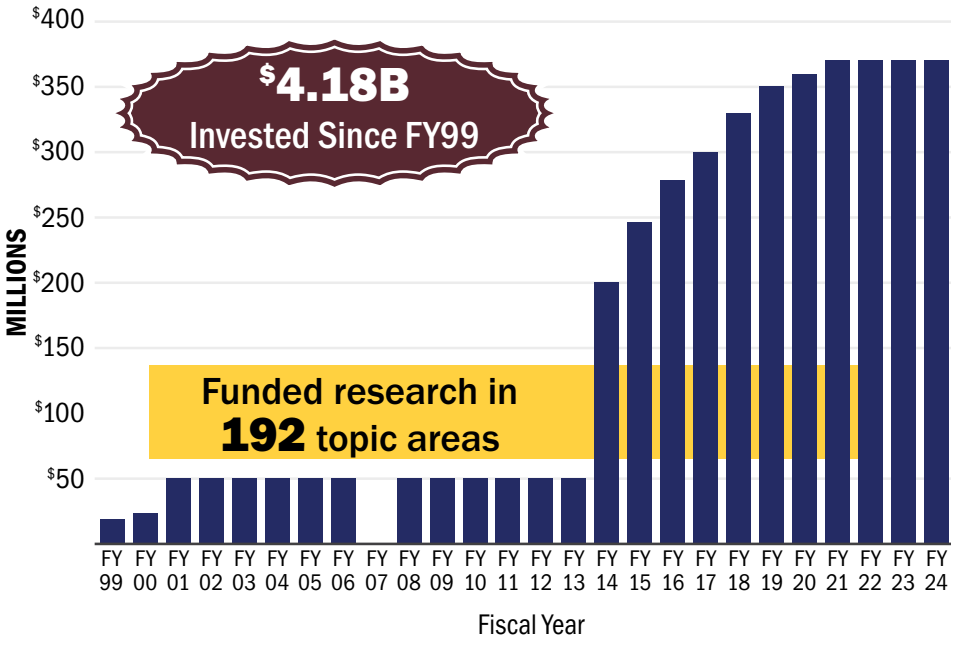
The CDMRP uses a two-tier research application review process. This process involves dynamic interaction between scientists, clinicians, consumers from advocacy communities, members of the military, and other specialists, as applicable. The first tier of evaluation is a scientific peer review of applications measured against established criteria determining scientific merit. The second tier is a programmatic review where applications with higher scientific or technical merit are evaluated for potential impact, adherence to the intent of the award mechanism, relevance to program goals and portfolio composition.

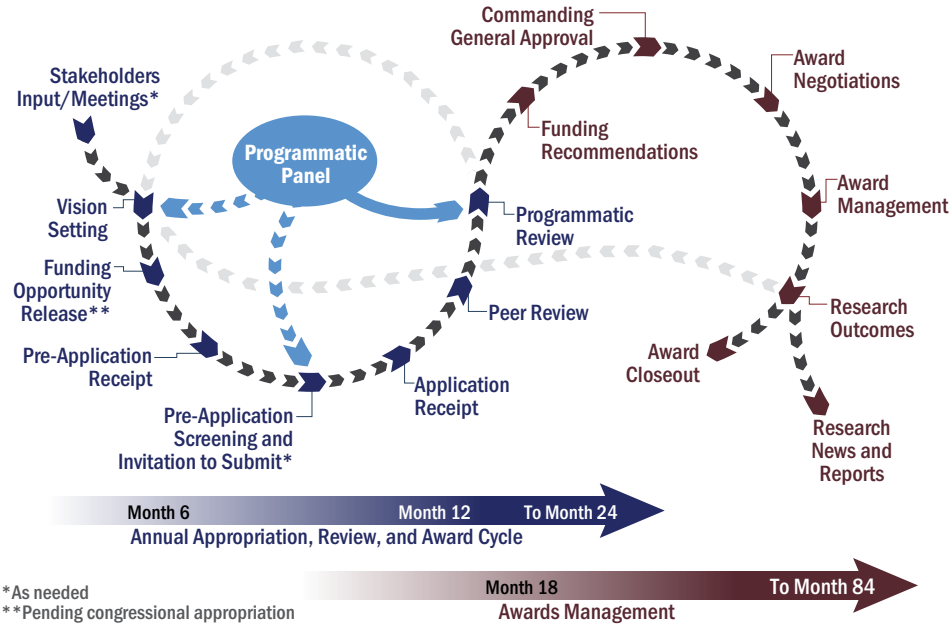


PEER REVIEWED MEDICAL RESEARCH PROGRAM

VISION: Improve the health, care and well-being of all military Service Members, Veterans and their Families

MISSION: Encourage, identify, select and manage medical research projects of clear scientific merit that lead to impactful advances in health care of Service Members, Veterans and their Families





*As needed
**Pending congressional appropriation

CDMRP Two-Tier Review Process

PRMRP PORTFOLIO-DRIVEN APPROACH

Established in FY99, the PRMRP supports military health-related research of **scientific merit** across the congressionally directed topic areas. The PRMRP groups related topic areas with relevant strategic goals into portfolios to address critical research gaps, offering several distinct advantages:

- Address prioritized needs and close research gaps
- Present clear, simple guidance to investigators
- Lend continuity year-over-year when or if Congress stops directing specific topic areas

FY24 PRMRP Portfolios and Topic Areas

FY24 Appropriation $370M

AUTOIMMUNE DISORDERS AND IMMUNOLOGY			
• Celiac Disease • Computational Biology for Precision Health	• Food Allergies • Guillain-Barré Syndrome • Inflammatory Bowel Disease	• Proteomics • Scleroderma	
CARDIOVASCULAR HEALTH			
• Computational Biology for Precision Health	• Congenital Heart Disease	• Proteomics	• Vascular Malformations
INFECTIOUS DISEASES			
• Computational Biology for Precision Health	• Congenital Cytomegalovirus • Far-UVC Germicidal Light	• Hepatitis B • Malaria	• Proteomics
INTERNAL MEDICINE			
• Accelerated Aging Processes Associated with Military Service	• Computational Biology for Precision Health • Focal Segmental Glomerulosclerosis	• Interstitial Cystitis • Lymphedema • Nephrotic Syndrome	• Pancreatitis • Polycystic Kidney Disease • Proteomics
NEUROSCIENCE			
• Computational Biology for Precision Health • Eating Disorder	• Maternal Mental Health • Myalgic Encephalomyelitis/ Chronic Fatigue Syndrome	• Neuroactive Steroids • Peripheral Neuropathy • Proteomics	• Suicide Prevention
ORTHOPAEDIC MEDICINE			
• Accelerated Aging Processes Associated with Military Service	• Computational Biology for Precision Health	• Musculoskeletal Disorders Related to Acute and Chronic Bone Conditions and Injuries	• Proteomics
RARE DISEASES AND CONDITIONS			
• Computational Biology for Precision Health • Dystonia • Ehlers-Danlos Syndrome • Epidermolysis Bullosa	• Fibrous Dysplasia/McCune-Albright Syndrome • Fragile X • Frontotemporal Degeneration	• Hereditary Ataxia • Hydrocephalus • Mitochondrial Disease • Myotonic Dystrophy • Proteomics	• Rett Syndrome • Sickle-Cell Disease • Von Hippel-Lindau Syndrome
RESPIRATORY HEALTH			
• Computational Biology for Precision Health	• Proteomics	• Pulmonary Fibrosis	• Respiratory Health

MAJOR PROGRAM OUTPUTS, FY99-FY23

2,427 Awards

121 Clinical Trial Awards

6,019 Publications

289 Products Under Development

678 Patents (applications or Issued)

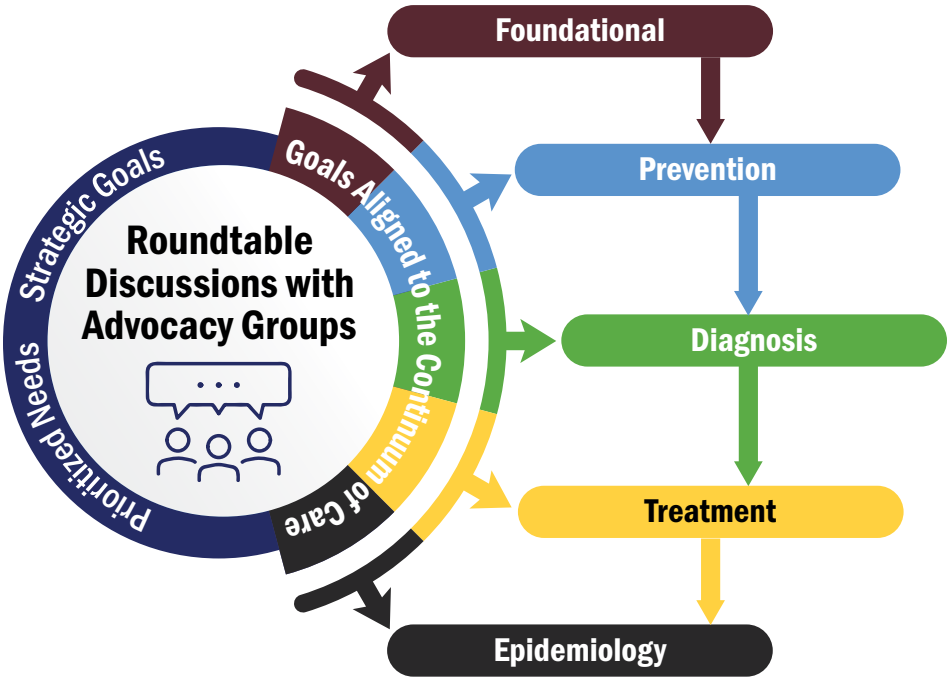
37 Commercialized Products

Learn more about individual portfolio contributions to PRMRP outputs and investments on the following pages.

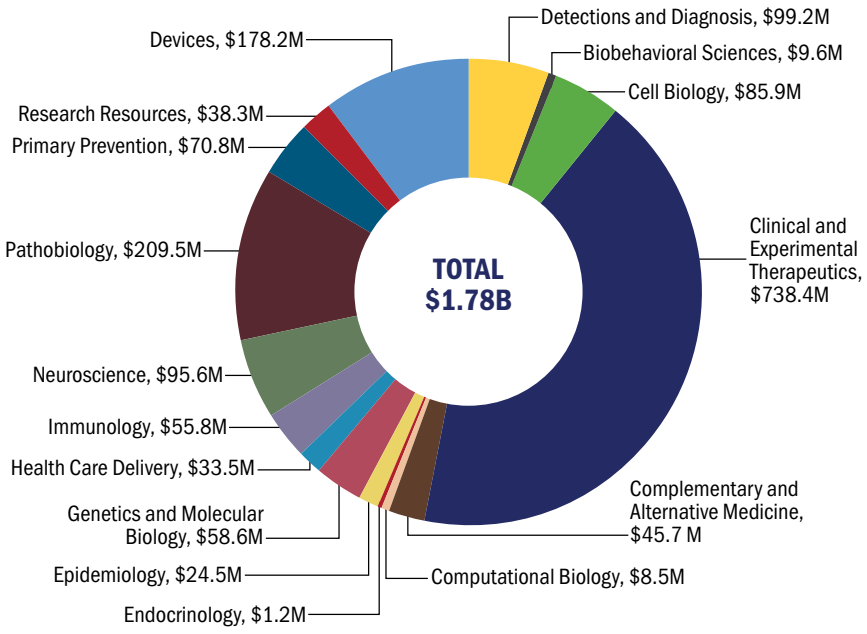
INVESTMENT STRATEGY

Stakeholder Collaborations

The PRMRP holds roundtable discussions with advocacy organizations, representing diseases and conditions from the congressionally directed topic areas, to identify unmet needs and key research gaps within the research community. The outcomes of these discussions, in addition to the congressional language and feedback from the Departments of War, Veterans Affairs and Health and Human Services and other relevant stakeholders, inform the portfolio-specific strategic goals aligned to the continuum of care.



FY20-FY24 PRMRP Investment By Research Category



*Other represents investments in Research Resources, $38.3M; Health Care Delivery, $33.5M; Epidemiology, $24.5M; Biobehavioral Sciences, $9.6M: Computational Biology, $8.5M; and Endocrinology, $1.2M.

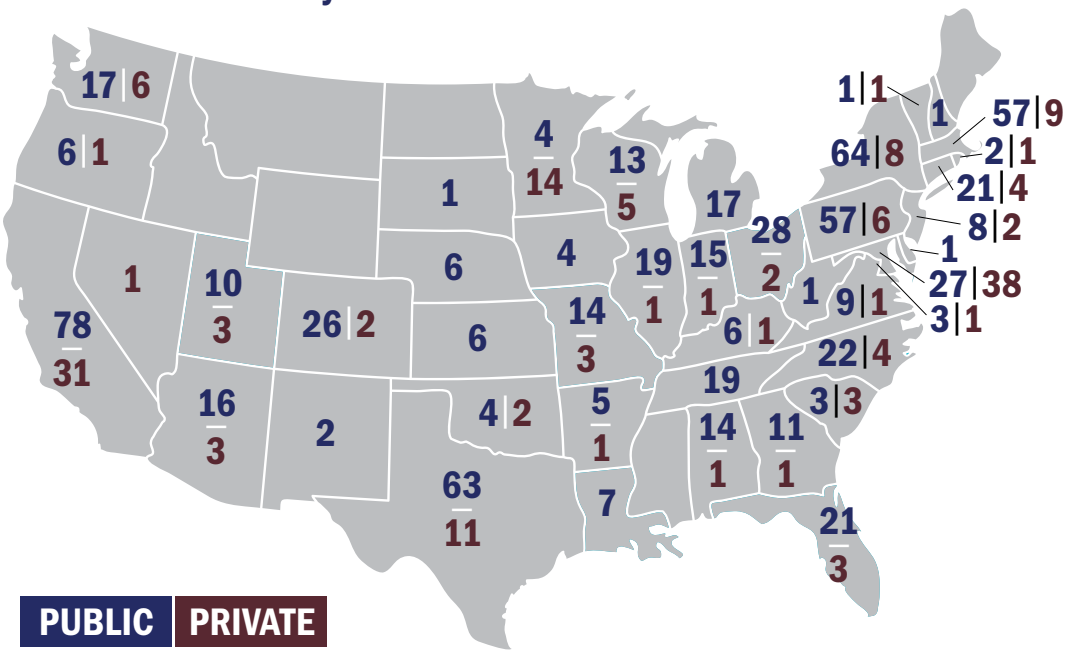
Investment Strategy Across the Continuum of Care

Each fiscal year, the PRMRP develops an investment strategy that supports research throughout the continuum of care, from early discovery through the development of ideas and products into clinical applications.

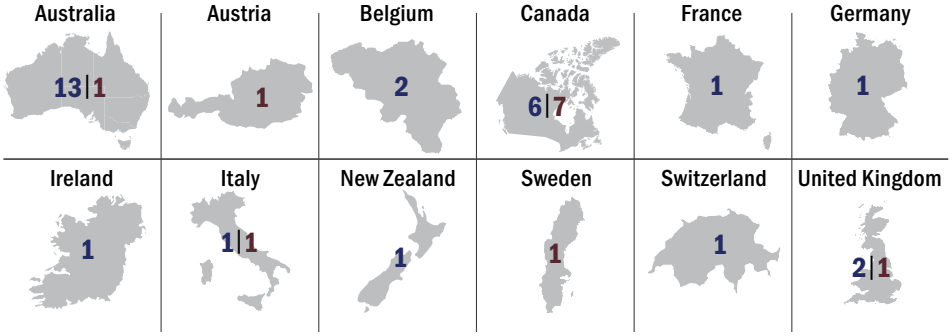
Basic Research	Translational Research	Clinical Trials/ Clinical Research
Discovery Award • Novel/breakthrough exploratory research, beyond incremental advances • High-risk/high-reward • No preliminary data	***Impact Award*** • Mature research studies, beyond incremental advances • Potential near-term clinical impact for patients • Seeks to translate preclinical findings into a clinical application • Strong in vivo preliminary data required	***Clinical Trial Award*** • Research that seeks to measure safety, effectiveness, and/or efficacy outcomes of an intervention in humans • Early-phase or large-scale interventional clinical trials
Investigator-Initiated Research Award • Preclinical expansion, replication, and/or comparative studies to validate preliminary or published data • Preliminary data required	***Technology/Therapeutic Development Award*** • Final steps of clinical translation for validated findings • IND[1]-/IDE[2]-enabling studies • Post-IND/-IDE studies required to transition a product or prototype utility • Strong preliminary data demonstrating product or prototype utility required	***Lifestyle and Behavioral Health Interventions Research Award*** • Clinical trials for nonpharmacological therapies or noninvasive devices • Clinical research focused on patient outcomes and quality of life

[1] Investigational New Drug application
[2] Investigational Device Exemption application

FY19-FY23 Awards by Location



PUBLIC | **PRIVATE**



WHY IS THERE A NEED FOR THE PEER REVIEWED MEDICAL RESEARCH PROGRAM?

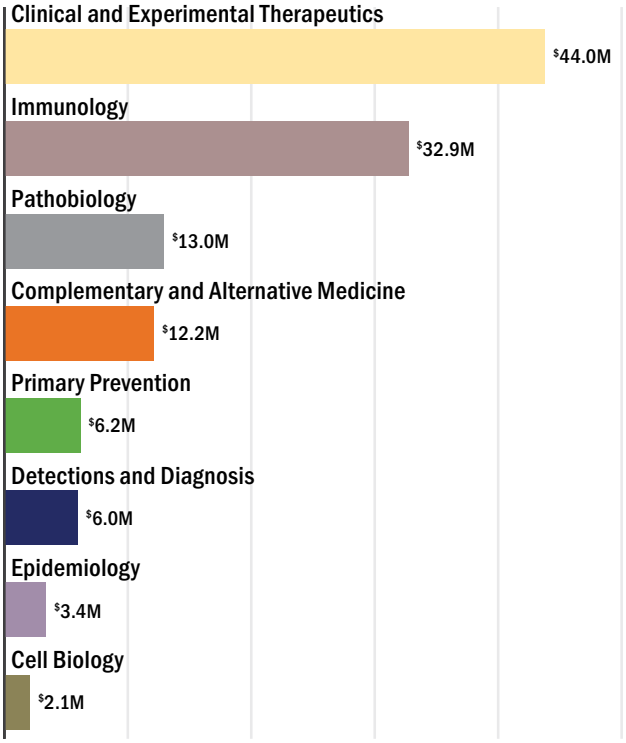
The PRMRP addresses **multiple topics** under a single program, streamlining administrative costs and maximizing funding for research.

In 2022, more than 50% of medical encounters by Service Members related to PRMRP topic areas.[1]

[1] Armed Forces Health Surveillance Division. *Medical Surveillance Monthly Report* 30, no. 6, 2023:7-20.

$119.9M
FY20-FY24 Investment

FY20-FY24 Awards by Scientific Focus



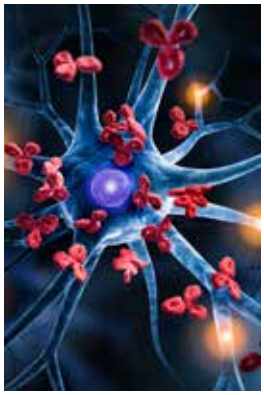
MAJOR OUTPUTS SINCE INCEPTION

179 Awards	452 Publications	3 Clinical Trial Awards
14 Products Under Development	34 Patents	1 Commercialized Product

FY20-FY23 Topic Areas

- Celiac Disease
- Eczema
- Food Allergies
- Guillan-Barré Syndrome
- Inflammatory Bowel Disease
- Neuroinflammatory Responses to Emerging Viral Diseases
- Proteomics
- Rheumatoid Arthritis
- Scleroderma

AUTOIMMUNE DISORDERS AND IMMUNOLOGY PORTFOLIO



FY24 Topic Areas
Celiac Disease
Computational Biology for Precision Health
Food Allergies
Guillain-Barré Syndrome
Inflammatory Bowel Disease
Proteomics
Scleroderma

FY24 Strategic Goals

Foundational Studies

- Triggers or factors impacting onset/progression of disease
- Associations between microbiome/gut-mediated inflammation
- Preclinical model to recapitulate human disease

Prevention

- Strategies to prevent onset/progression of disease

Diagnosis

- Noninvasive methods for diagnosis/continuous monitoring of inflammation
- Tools to assess neurologic outcomes of disease/condition

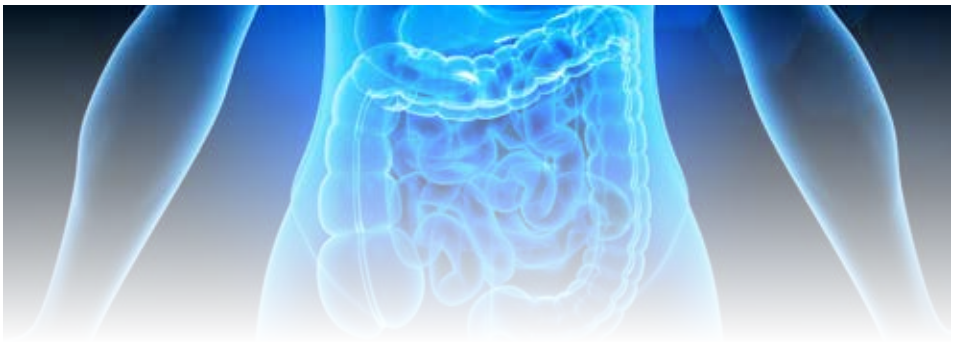
Treatment

- Therapies to reduce inflammation and sequelae and promote tissue healing
- Treatments to minimize toxicity and mitigate disease

Epidemiology

- Patient-centered research for disease burden
- Population-based studies to identify risk factors for disease
- Decrease disease disparities in women and minorities
- Longitudinal studies to understand incidence/progression of disease/condition

MAKING AN IMPACT



RESEARCH

Molecular Mimic Restores Gastrointestinal Barrier Integrity and Function in Inflammatory Bowel Disease, *PR210110*

Investigational New Drug application-enabling study evaluating a molecule, PAAG17G, for the non-systemic treatment of ulcerative colitis to promote tissue healing and restore intestinal barrier function.

Gut Microbiome Byproducts to Modulate the Immune System in Inflammatory Bowel Diseases, *PR220071*

Pre-clinical studies combine chemistry, immunology and microbiology to develop novel immunomodulatory compounds derived from human symbiotic gut microbes for the treatment of inflammatory bowel diseases.

PRODUCT

Real-Time Scoring of Scleroderma Symptoms for Treatment Monitoring, *PR171811 and PR231656*

Mobile application to monitor scleroderma patients with systemic sclerosis-associated Raynaud phenomenon. In a current PRMRP-supported clinical trial, the Raynaud app serves as a clinical research tool in the evaluation of a commercially available non-invasive wearable device for its effectiveness as an intervention for scleroderma symptoms.

Photo provided by Robyn Domsic, M.D.

"From the very first moment of my involvement [with PRMRP], it was constantly re-iterated just how important my own view and insights were to the success of the entire process, despite not being a scientist or expert myself. The PRMRP truly takes patient views seriously, and I rest easy knowing that patients' voices will continue to be the focus of research conducted through this program."

Kelsey Partyka,
Celiac Disease Foundation

RELEVANCE TO MILITARY HEALTH

- U.S. Veterans show a prevalence of rheumatoid arthritis at 50% to 60% greater than non-Veterans.[1]
- Over 66,000 Veterans live with inflammatory bowel disease, encompassing both Crohn's disease and ulcerative colitis.[2]
- IBD commonly:
  - Requires surgical intervention
  - Leads to colorectal cancer development
  - Disqualifies Service Members from active service[3]

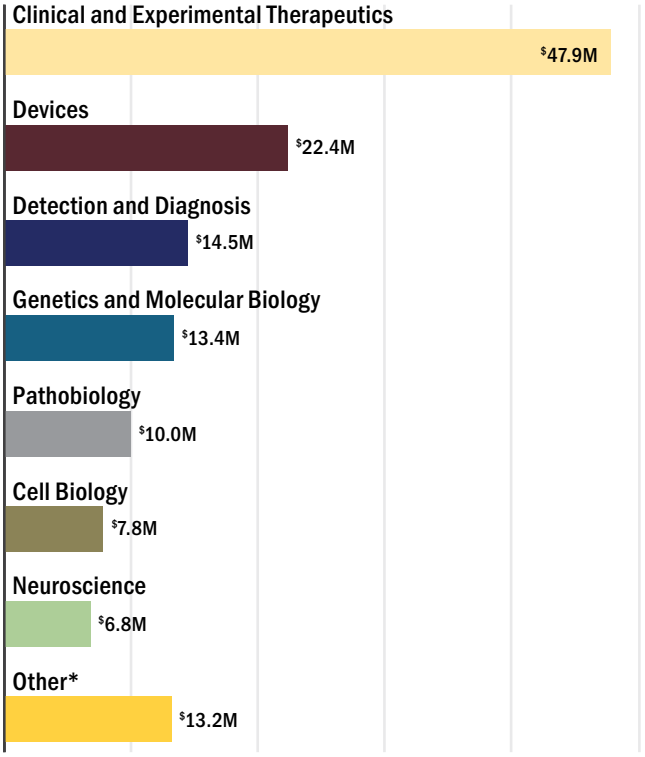
[1] Fallon EA, et al. *Morb Mortal Wkly Rep*, 72, no. 45, 2023:1209-1216.

[2] Betteridge, JD et al. *Inflammatory Bowel Diseases* 19, no. 7, 2013:1421-1427.

[3] Dept. of the Army, *Standards of Medical Fitness*. Army Regulation 40-501, 2019.

$136.1M
FY20-FY24 Investment

FY20-FY24 Awards by Scientific Focus



**Other represents investments in Primary Prevention, $3.7M; Research Resources, $3.3M: Health Care Delivery, $3.2M; Computational Biology, $1.7M; and Epidemiology, $1.3M.*

MAJOR OUTPUTS SINCE INCEPTION

183 Awards	682 Publications	8 Clinical Trial Awards
24 Products Under Development	66 Patents	3 Commercialized Products

FY20-FY23 Topic Areas

- Cardiomyopathy
- Congenital Heart Disease
- Familial Hypercholesterolemia
- Hypercholesterolemia
- Hypertension
- Proteomics
- Vascular Malformations
- Women's Heart Disease

CARDIOVASCULAR HEALTH PORTFOLIO

FY24 Topic Areas

- Computational Biology for Precision Health
- Congenital Heart Disease
- Proteomics
- Vascular Malformations

FY24 Strategic Goals

Prevention

- Strategies to prevent or reduce impact of disease on target organs
- Strategies to understand biological and societal factors to prevent disease onset

Diagnosis

- Strategies for detection before clinical symptoms
- Technologies for diagnosing, predicting and tracking disease outcomes and progression

Treatment

- Therapeutics that address biological differences

Epidemiology

- Civilian and/or military population risk factors that contribute to disease
- Population-/outcomes-based research to identify biologic and societal impacts of disease

"The experience of being a reviewer on the cardiovascular research panel was very positive - it "exercised my brain" by reading the proposals and writing the critiques, excited me about what was coming down the "pipeline" and importantly gave me and others with cardiovascular disease hope for better treatments and outcomes. I was impressed with the implementation of all phases of the Peer Reviewed Medical Research Program and I applaud the DOD for investing in "high-risk, high-reward" research from the bench to the bedside."

Kay Carlisle,
Providence Cancer Institute

MAKING AN IMPACT

RESEARCH

Women's Ischemia Trial to Reduce Events in Non-Obstructive CAD, WARRIOR, *PR161603*

The first-ever clinical trial will include active-duty and retired military women, as well as Veterans, dependents and civilians, for a total of 2,476 participants, to test the efficacy of intensive medical treatment compared to current primary care guidelines to modify risk factors and reduce cardiovascular events in women with coronary arteries showing no severe obstruction but with cardiac symptoms and abnormal stress tests. The trial will provide evidence-based treatment guidelines to decrease cardiovascular mortality, morbidity and health-care costs for women.

Evaluation of the Cardiac and Metabolic Effects of Semaglutide in Heart Failure with Preserved Ejection Fraction, *PR211898*

Glucagon like peptide-1, or GLP-1, receptor agonists such as semaglutide or Ozempic® originally intended to manage blood glucose levels in individuals with type 2 diabetes but currently see wide prescribing for weight loss. This clinical trial will determine whether an aggressive weight loss intervention based on semaglutide treatment and a healthy lifestyle improves heart function and reduces cardiac abnormalities in patients with obesity-related cardiomyopathy and heart failure with preserved ejection fraction.

PRODUCTS

Butterfly iQ portable, single-probe, point-of-care ultrasound for use with a smartphone or tablet, *PR221487*

The project developed several ultrasound technologies contributing to a portable imager. The research resulted in several patents that influenced the development of iQ ultrasound instruments.

Noninvasive sensor systems for patient monitoring and defibrillators, *PR012302*

The award funded the development and testing of initial prototypes currently incorporated into several commercial devices, including the Sotera Digital Health ViSi Mobile® System and ZOLL Propaq® MD and X Series.

Veterans Affairs Women Cardiovascular Disease 10-Year Risk Score predicts the first cardiovascular disease event for female Service Members and Veterans using a retrospective, VA national electronic health records database, *PR210137*

The new risk score improves predicting 10-year atherosclerotic cardiovascular risk for younger and minority women in the military compared to the 2013 American College of Cardiology and American Heart Association risk score because the model incorporated a representative VA women cohort. The VA Women CVD Risk Score is publicly available at vawomencvdriskcalculator.org. A follow-on PRMRP award will reclassify the VA Women CVD Risk Score to fit both VA and non-VA women populations with the goal to develop point-of-care tools that assess CVD risk of women from all backgrounds, taking into consideration military service, young age, race and ethnicity.

RELEVANCE TO MILITARY HEALTH

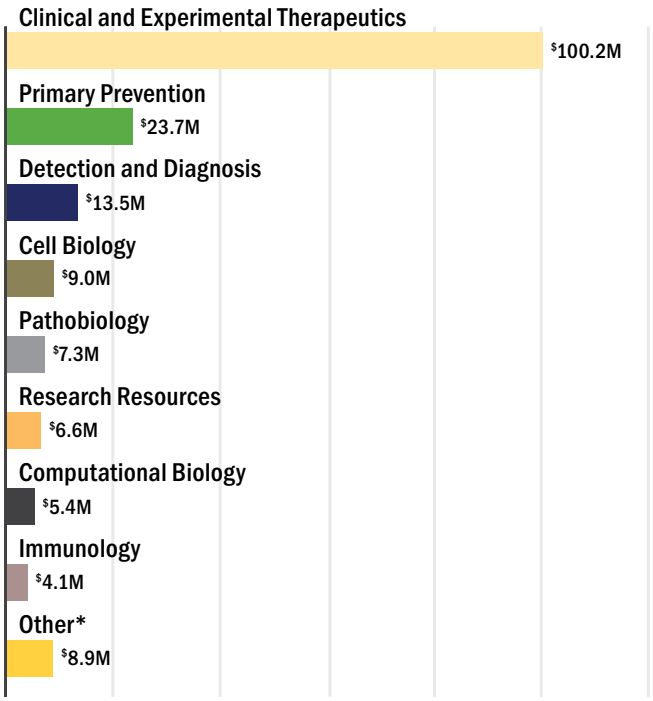
- Offspring of Gulf War Veterans show greater incidence of congenital heart defects compared to offspring from non-deployed Veterans.[1]
- Blunt force trauma and traumatic brain injury increase the risk of arteriovenous malformation, abnormal connections between arteries and veins, which can prevent return to duty.[2]

[1] Araneta MRG, et al. *Birth Defects Res A Clin Mol Teratol*, 67, no. 4, 2003:246-260.

[2] Miller BA, et al. *Journal of Neurosurgery: Pediatrics* 14, no. 4, 2014:418-420.

$178.7M
FY20-FY24 Investment

FY20-FY24 Awards by Scientific Focus



**Other represents investments in Devices, $3.2M; Complementary and Alternative Medicine, $3.1M; Epidemiology, $1.9M; and Genetics and Molecular Biology, $0.7M.*

MAJOR OUTPUTS SINCE INCEPTION

329 Awards	762 Publications	23 Clinical Trial Awards
46 Products Under Development	124 Patents	2 Commercialized Products

FY20-FY23 Topic Areas

- Emerging Viral Diseases
- Hepatitis B
- Malaria
- Neuroinflammatory Responses to Emerging Viral Diseases
- Plant-Based Vaccines
- Proteomics
- Tuberculosis
- Viral Diseases

INFECTIOUS DISEASES PORTFOLIO

FY24 Topic Areas
Computational Biology for Precision Health
Congenital Cytomegalovirus
Far-UVC Germicidal Light
Hepatitis B
Malaria
Proteomics

FY24 Strategic Goals

Foundational Studies

- Elucidate long-term complications following infections

Prevention

- Immunoprophylaxis to prevent disease onset and/or progression
- Strategies to eliminate and reduce maternal-fetal transmission
- Strategies for rapid prediction of protective antigens and epitopes

Diagnosis

- Correlates of protection induced by prophylactic treatment or natural infection
- Non-invasive, pathogen-agnostic diagnostic tools/assays using patient-derived samples

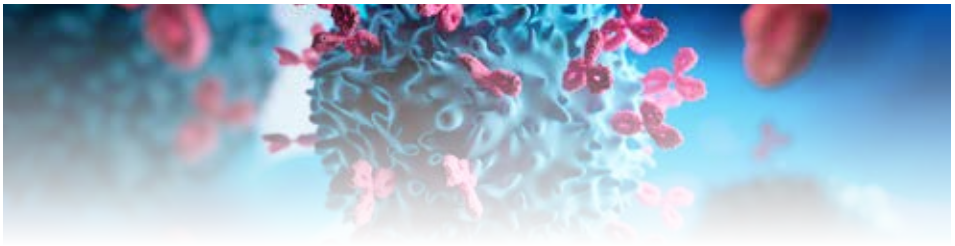
Treatment

- Treatment and clinical network expansion to test therapeutics for severe/chronic disease
- Effective, shorter treatment regimens

Epidemiology

- Develop surveillance strategies or models utilizing biomarkers to predict outbreaks or epidemics

MAKING AN IMPACT



RESEARCH

Development of a Monoclonal Antibody for the Prevention and Treatment of Zika Virus Infection, *PR181082*

IDB002, a monoclonal antibody for treatment, prevention and post-exposure prophylaxis of Zika virus infection.

Prebiotic Inulin to Limit Antimicrobial-Resistant Infections During Critical Illness: A Phase 2 Clinical Trial, *PR181960*

A phase 2 clinical trial at Columbia Medical Center for the use of prebiotic inulin as a method to reduce antimicrobial-resistant, or AMR, infections. Inulin, a soluble prebiotic fiber, promotes the growth of short-chain fatty acid-producing bacteria, which decreases AMR colonization and downstream infection.

PRODUCTS

cobas® Liat® "Laboratory in a Tube" System, a point-of-care device for the fast and reliable detection of many pathogens including SARS-CoV-2, Influenza A/B, RSV, Group A Strep and *C. Difficile*, *PR043347*

This award supported the development of reagents, design control and first successful clinical testing of cobas® Liat® System, a combined instrument and assays for detecting cutaneous leishmaniasis.

Easy-to-use, point of care MeMed BV® test and the MeMed Key® Platform for differentiating bacterial versus viral infections, *PR160433*

The award supported scale-up of the materials production, including the cartridge for running the MeMed BV® test and the MeMed Key® Platform, while meeting Good Manufacturing Practices as required by the FDA. The project expedited production of investigational-use-only units deployed in a U.S. clinical study, called "Apollo," designed to support FDA clearance of the MeMed Key®/BV®.

"As a patient, it is both a privilege and an important opportunity to participate in the review of research proposals and to provide feedback aimed at enhancing the effective use of taxpayer funds in improving patient health outcomes."

Jacki Chen,
Hepatitis B Foundation

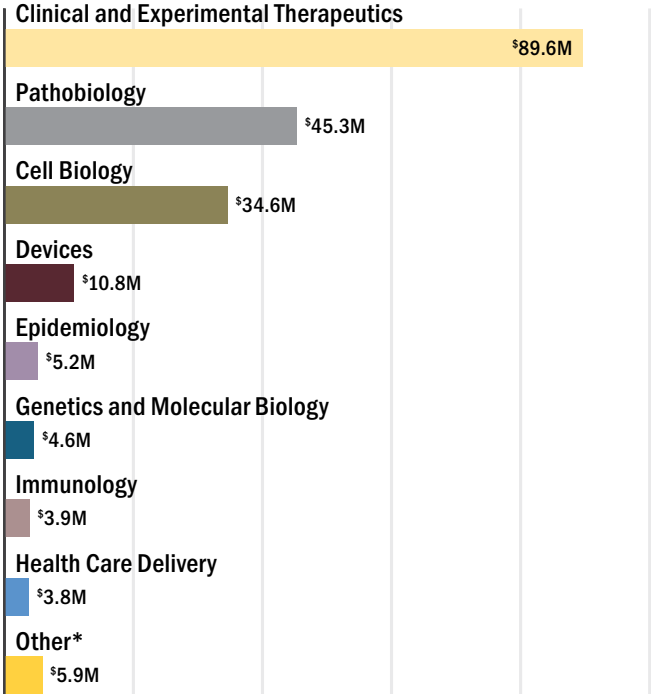
RELEVANCE TO MILITARY HEALTH

- Service Members may operate where infectious disease threats present risks to readiness and performance.[1]
- Warfighters require prevention and treatment strategies for infectious diseases, including AMR infections, at treatment facilities and in the field.[1]

[1] Military Infectious Diseases Research Program, https://mrdc.health.mil/index.cfm/program_areas/medical_research_and_development/midrp_overview

$203.7M
FY20-FY24 Investment

FY20-FY24 Awards by Scientific Focus



**Other represents investments in Detection and Diagnosis, $3.4M; Research Resources, $2.1M; and Neuroscience, $0.4M.*

MAJOR OUTPUTS SINCE INCEPTION

250 Awards	716 Publications	15 Clinical Trial Awards
26 Products Under Development	61 Patents	2 Commercialized Products

FY20-FY23 Topic Areas

- Endometriosis
- Focal Segmental Glomerulosclerosis
- Interstitial Cystitis
- Lymphatic Disease
- Lymphedema
- Nephrotic Syndrome
- Pancreatitis
- Polycystic Kidney Disease
- Pressure Ulcers
- Proteomics
- Sustained Release Drug Delivery

INTERNAL MEDICINE PORTFOLIO

FY24 Topic Areas
Accelerated Aging Processes Associated with Military Service
Computational Biology for Precision Health
Focal Segmental Glomerulosclerosis
Interstitial Cystitis
Lymphedema
Nephrotic Syndrome
Pancreatitis
Polycystic Kidney Disease
Proteomics

FY24 Strategic Goals

Foundational Studies

- Understanding molecular underpinnings, progression, comorbidities and complications of disease
- Tools translated from basic research to improve treatment regimens and drug discovery
- Multi-organ research to understand bodily effects of disease

Prevention

- Strategies to prevent disease

Diagnosis

- Tool and technology development for early detection, diagnosis and tracking of disease
- Disease management tools to decrease time between symptom presentation and care
- Biomarker and genetic studies to understand heterogeneity and disease progression

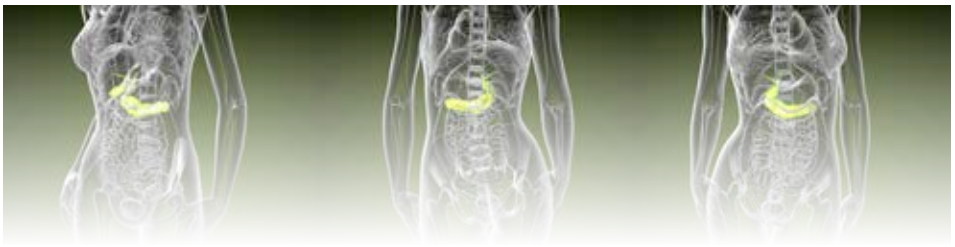
Treatment

- Treatments and interventions to improve psychosocial function and quality of life
- Combination therapies to delay disease progression and manage chronic pain
- Artificial organ development

Epidemiology

- Population-based studies for risk factors of disease onset, progression and comorbidities
- Surrogate endpoints to accelerate approval of new treatments
- Natural history studies to track disease prevalence
- Educational and health-tracking programs/platforms for increased disease awareness

MAKING AN IMPACT



RESEARCH

Evaluation of Pirfenidone as a Therapy in Patients with Predicted Moderate to Severe Acute Pancreatitis, *PR203478*
A clinical trial for the evaluation of safety, tolerability and efficacy of pirfenidone in patients with severe acute pancreatitis.

An Innovative Wound Management Solution for Reducing Dressing Changes and Burden of Care in the Treatment of Pressure Injuries, *PR203476*
A randomized, controlled, multi-center, phase 4 clinical study to evaluate the efficacy of transforming powder dressing for treatment of pressure injuries for reducing dressing changes and burden of care.

Development of 2-Deoxy-D-Glucose for the Treatment of Polycystic Kidney Disease, *PR210615*
Development and evaluation of glucose analogue 2-deoxy-D-glucose as an effective oral treatment for autosomal dominant polycystic kidney disease for improved health and delayed end-stage kidney disease requiring dialysis or transplantation.

PRODUCTS

RAVEN III, a portable, open-architecture surgical robot that allows for telesurgery over the internet and research in advanced surgical techniques, *PR012296*
The project developed a prototype for the surgical robot manipulator system and conducted the first experimental animal telesurgery.

Molecular Decision Inc. nanoscale immunoassay uses a proteomic detection method and requires small sample amounts for the development of diagnostics and therapeutic agents for myelodysplastic syndrome and other cancers, *PR080163*
The project developed and optimized the nanoscale immunoassay protocols/assays that enabled direct readouts for monitoring the molecular mechanism of response to targeted therapeutics in cells.

"Having been afflicted with two diseases that currently have no cure, I find the PRMRP to be a bright shining star of hope for countless millions like me. I am confident that the program's work will ultimately lead to finding cures for many diseases through the research the program funds annually. This funding is making a real difference in pushing the boundaries of science and innovation to reach discoveries that may otherwise not be possible. The peer review with citizen involvement in prioritizing research funding is helping to target research based on real needs and is worthy of emulation."

Prabhakar Somavarapu,
PKD Foundation

RELEVANCE TO MILITARY HEALTH

- Between 2010 and 2019, the Military Health System supported 111,000 medical appointments for Service Members and their family members suffering from kidney disease.[1]
- Over 32% of patients with spinal cord injuries develop pressure ulcers;[2] approximately 2.5 million individuals in the U.S. develop pressure ulcers in acute care facilities every year.[3]

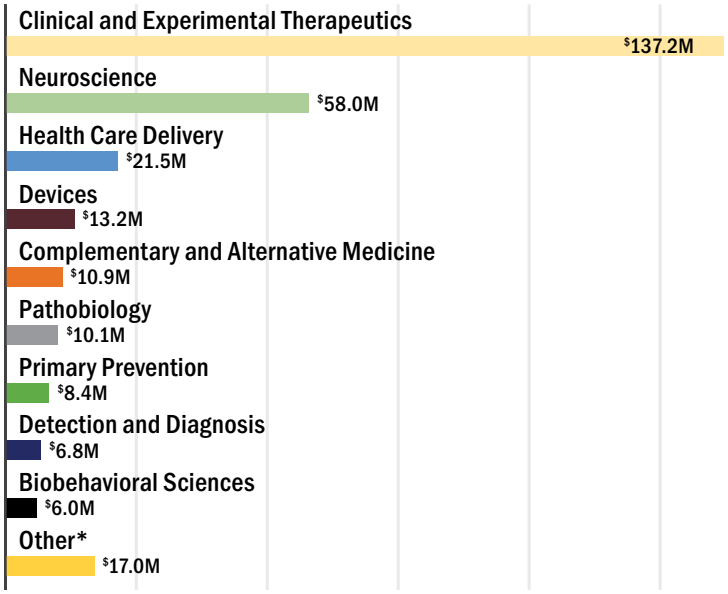
[1] Armed Forces Health Surveillance Division

[2] Shiferaw WS, et al. *BMC Musculoskeletal Disorders* 21, 2020:334.

[3] Reddy M, et al. *JAMA* 300, no. 22, 2008:2647-2662.

$289.0M
FY20-FY24 Investment

FY20-FY24 Awards by Scientific Focus



**Other represents investments in Research Resources, $5.6M; Cell Biology, $5.1M; Epidemiology, $4.8M; Immunology, $0.6M; Genetics and Molecular Biology, $0.4M; and Computational Biology, $0.3M.*

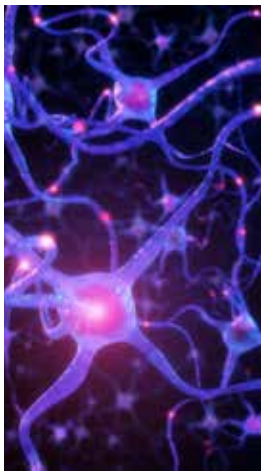
MAJOR OUTPUTS SINCE INCEPTION

352 Awards	904 Publications	38 Clinical Trial Awards
55 Products Under Development	51 Patents	20 Commercialized Products

FY20-FY23 Topic Areas Funded

- Chronic Migraine and Post-Traumatic Headache
- Eating Disorders
- Maternal Mental Health
- Myalgic Encephalomyelitis/ Chronic Fatigue Syndrome
- Non-Opioid Therapy for Pain Management
- Peripheral Neuropathy
- Sleep Disorders and Restriction
- Suicide Prevention

NEUROSCIENCE PORTFOLIO



FY24 Topic Areas
Computational Biology for Precision Health
Eating Disorders
Maternal Mental Health
Myalgic Encephalomyelitis/Chronic Fatigue Syndrome
Neuroactive Steroids
Peripheral Neuropathy
Proteomics
Suicide Prevention

FY24 Strategic Goals

Foundational Studies

- Mechanisms underlying disease
- Computational methods to improve understanding and assess treatment of disease

Prevention

- Efficacy of methods to prevent disease

Diagnosis

- Diagnostics for neurological and psychological health and cognitive assessment
- Strategies for early diagnosis and monitoring
- Strategies to identify and prioritize at-risk individuals

Treatment

- Novel treatment and therapeutic target development
- Strategies for sex differences in diseases that disproportionately affect women

Epidemiology

- Population-based studies on risk factors for onset and progression of disease
- Studies to assess community-based treatment and prevention strategies on patient outcomes
- Barriers to treatment access and their mitigation strategies
- Population-based studies of prevalence, medical service usage and quality of life of those affected by the disease

MAKING AN IMPACT

RESEARCH

Augmenting Suicide Prevention Interventions for Service Members, *PR21029*

Five collaborative, synergistic research studies to improve effectivity and efficiency of suicide prevention treatments.

A Predictive Test for Postpartum Depression, *PR230933*

Clinical trial testing efficacy of early risk-assessment classification and its impact on postpartum depression outcomes.

PRODUCTS

HearID® Auditory Diagnostic System and OtoStat 2.0, *PR002159*

The project developed and validated the instrumentation, including reduction of the signal-to-noise ratio, and demonstrated detection of noise-reduced hearing loss in individuals.

iSTAT Traumatic Brain Injury Blood and Plasma Test, *PR023109 and PR064667*

The study measured TBI blood-based biomarkers to assess injury magnitude and need for additional testing.

DANYELZA®, *PR093961 and PR111043*

A phase 1 clinical trial dose escalation study in patients with relapsed or resistant neuroblastoma.

SAFTE Model and FAST Scheduling Software, *PR991004 and PR054093*

The project enhanced tools to predict transmeridian travel across time zones and cognitive performance of individuals undergoing shiftwork schedule changes.

"As a consumer, I have a unique but important perspective that the scientific reviewers want to hear to better understand how consumers are affected. I hope that the PRMRP continues to include consumers on their panels and continues to grow to help with so many important issues. "

Andrew Leece,
American Foundation for Suicide Prevention

RELEVANCE TO MILITARY HEALTH

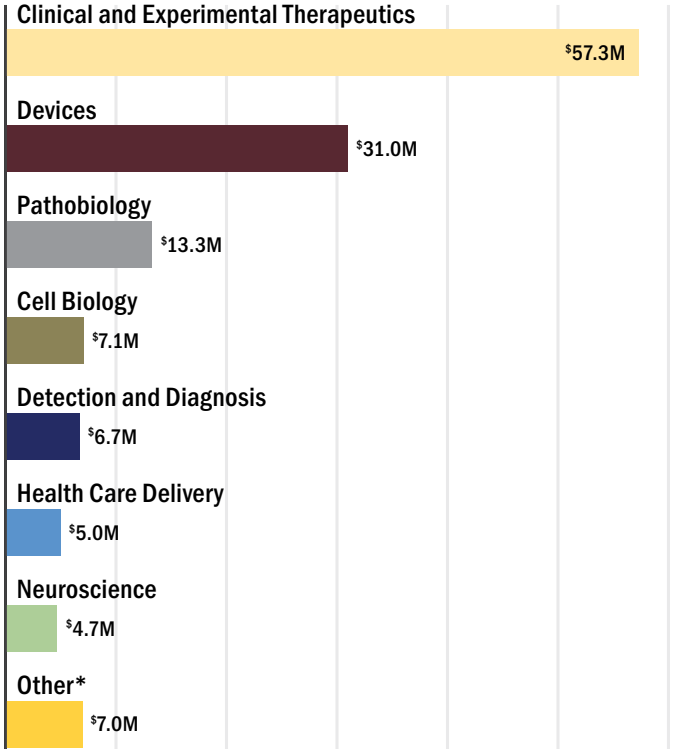
- In a study of post-9/11 Veterans with service-related traumatic brain injury, nearly 58% reported post-traumatic headache, a secondary headache attributed to trauma of the head and/or neck.[1]
- More than 44% of active-duty Soldiers report injuries with severe chronic pain and nearly 15% use opioid painkillers after combat deployment.[2]

[1] Lindquist LK, et al. *J Neuropsychiatry Clin Neurosci* 29, no. 3, 2017:254-259.

[2] Jonas WB, et al. *JAMA Internal Medicine* 174, no. 8, 2014:1402-1403.

$132.1M
FY20-FY24 Investment

FY20-FY24 Awards by Scientific Focus



**Other represents investments in Immunology, $3.9M; Genetics and Molecular Biology, $2.4M; and Primary Prevention, $0.7M.*

MAJOR OUTPUTS SINCE INCEPTION

167 Awards	506 Publications	6 Clinical Trial Awards
21 Products Under Development	79 Patents	2 Commercialized Products

FY20-FY23 Topic Areas

- Arthritis
- Musculoskeletal Disorders Related to Acute and Chronic Bone Conditions and Injuries
- Musculoskeletal Health
- Orthopedics
- Proteomics
- Trauma

ORTHOPAEDIC MEDICINE PORTFOLIO

FY24 Topic Areas

- Accelerated Aging Processes Associated with Military Service
- Computational Biology for Precision Health
- Musculoskeletal Disorders Related to Acute and Chronic Bone Conditions and Injuries
- Proteomics

FY24 Strategic Goals

Foundational Studies

- Mechanisms of musculoskeletal disorders pathology
- Accelerated degeneration following joint injuries
- Role of steroid hormones and biological sex in orthopaedic health

Prevention

- Improved point of injury care
- Prevention of microbial infections that occur with fractures and/or trauma
- Prevention of orthopaedic-related conditions in women

Diagnosis

- Strategies for early, precise diagnosis

Treatment

- Intra-articular treatments for joint injuries
- Increase quality of life and halt or slow disease progression
- Musculoskeletal disorder rehabilitation regimens to facilitate return to duty
- Treatment for orthopaedic-related conditions in women

Epidemiology

- Patient-reported outcomes research for treatment or exercise recommendations

MAKING AN IMPACT

RESEARCH

Sustained-Release Drug Delivery Device to Manage Biofilm Implant-Related Infection, *PR231420*

Often, open complex fractures lead to the development of infections known as biofilms that do not allow for healing, further compounded by the fact that traditional antibiotic therapeutics do not deliver high concentrations at the sight of injury to prevent the development and onset of infection. This award supports development of the Purgo Pouch, an implantable device that will deliver sustained-release antibiotics to complex fractures at the site of injury in doses high enough to fight infection.

Clinical Study of Sustained-Release Implant for Trauma Repair, *PR221938*

The first-in-human clinical trial will test safety and efficacy of OsteoAdapt SP, a spinal fusion product, for transforaminal lumbar interbody fusion procedures. OsteoAdapt SP involves a novel variant of a skeletal development protein, called AMP2, that binds tightly to implant materials. Resorbable implants coated with AMP2 can remain at the implant site for the time required to regenerate bone.

PRODUCTS

The Trauma Survivors Network NextSteps interactive self-management program for patients with serious injury, *PR054556*

This award supported development of the American Trauma Society's Trauma Survivors Network NextSteps face-to-face and online programs. A pilot study with 30 civilian trauma patients demonstrated patient benefits and high satisfaction with the program.

Veterans Affairs/Centers for Medicare and Medicaid Services Male Veteran Osteoporosis Database, guidance on treatment and new models of screening for osteoporosis, *PR110381*

The project developed a VA/CMS Male Osteoporosis database of administrative and electronic health record data for all U.S. male Veterans receiving primary care within the VA between 2000-2010, a total of 5,869,668 patients, after examining VA dual-energy X-ray absorptiometry testing practices. Results led directly to the development of two new models of primary osteoporosis screening currently serving multiple VA medical centers, or VAMCs, through a randomized clinical trial. The VA central office Osteoporosis Field Advisory Committee disseminated these results in their outreach activities to VAMCs, nationally encouraging programs to screen Veterans with the risk factors identified under this award.

"As someone living with a rare disease and raising two children with the same rare disease, being a consumer reviewer with the PRMRP has been such an honor Everyone that I've worked with, from the administrators to the scientific reviewers, gave me the sense that they understood how important it is for consumer reviewers to have a seat at the table when research and funding decisions are being discussed. Without our voice, crucial details are missed, gaps are overlooked and we risk perpetuating assumptions in research instead of addressing real-world challenges."

Michelle Fynan,
Osteogenesis Imperfecta Foundation

RELEVANCE TO MILITARY HEALTH

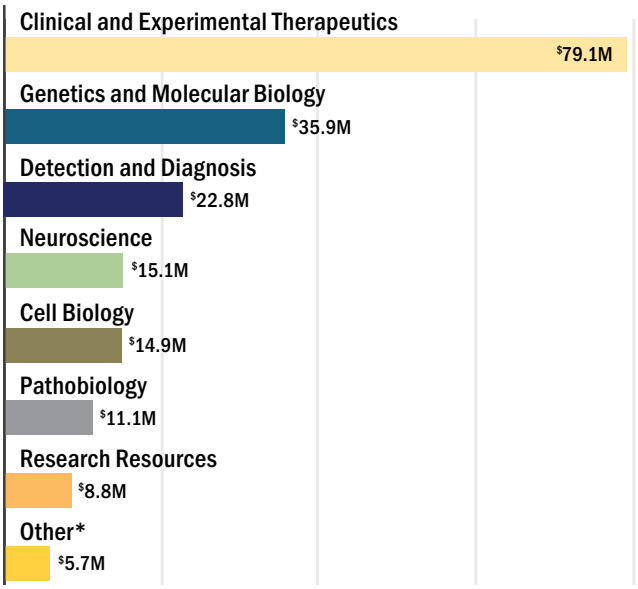
- Osteoarthritis is the most frequent disabling condition leading to discharge of military personnel from active duty and the most common cause of permanent disability in military personnel.[1]
- Musculoskeletal injuries represent the leading cause of medical visits and disability in the U.S. military.[2]

[1] Cameron KL, et al. *J Athl Train*, 51, no. 11, 2016:952-961.

[2] Grimm PD, et al. *Sport Med Arthrosc* 27, no. 3, 2019:84-91.

$193.4M
FY20-FY24 Investment

FY20-FY24 Awards by Scientific Focus



**Other represents investments in Epidemiology, $3.0M; Devices, $2.5M; and Biobehavioral Sciences, $0.3M.*

MAJOR OUTPUTS SINCE INCEPTION

237 Awards	497 Publications	3 Clinical Trial Awards
20 Products Under Development	45 Patents	2 Commercialized Products

FY20-FY23 Topic Areas

- Dystonia
- Ehler-Danlos Syndrome
- Epidermolysis Bullosa
- Fibrous Dysplasia/McCune Albright Syndrome
- Fragile X
- Friedreich's Ataxia
- Frontotemporal Degeneration
- Hereditary Ataxia
- Hydrocephalus
- Mitochondrial Disease
- Myotonic Dystrophy
- Proteomics
- Rett Syndrome
- Sickle-Cell Disease
- Sustained-Release Drug Delivery
- Von Hippel-Lindau Syndrome Benign Manifestations

RARE DISEASES PORTFOLIO

FY24 Topic Areas	
Computational Biology for Precision Health	Hydrocephalus
Dystonia	Mitochondrial Disease
Ehlers-Danlos Syndrome	Myotonic Dystrophy
Epidermolysis Bullosa	Proteomics
Fibrous Dysplasia/McCune-Albright Syndrome	Rett Syndrome
Fragile X	Sickle-Cell Disease
Frontotemporal Degeneration	Von Hippel-Lindau Syndrome
Hereditary Ataxia	

FY24 Strategic Goals

Foundational Studies

- Mechanisms underlying disease onset, progression and heterogeneity
- Biomarkers associated with disease phenotype or subtype
- Preclinical models to recapitulate phenotype of disease

Diagnosis

- Biomarkers to predict onset, therapy response or complications and disease progression
- Diagnostic criteria and screening tools for early detection and tracking disease progression
- Physiological impact related to diagnosis and timing of diagnosis

Treatment

- Treatments that will minimize side effects
- Curative strategies
- Interventions improving neuropsychological outcomes, cognitive symptoms and comorbidities
- Support ongoing treatments during life transitions

Epidemiology

- Population-based studies to identify risk, determinants or protective factors of disease
- Longitudinal studies to understand incidence, prevalence and progression of disease
- Tools to collect, mine and integrate real-world data with electronic medical records
- Clinically relevant endpoints for clinical trials

MAKING AN IMPACT

RESEARCH

A Stem Cell-Based Therapy for Recessive Dystrophic Epidermolysis Bullosa Delivered with a Spray-On Skin Device, *PR222029*

A stem cell-based therapy that results in a patient-specific skin graft for epidermolysis bullosa, a group of rare diseases that results in extremely fragile skin that tears and blisters with very little provocation.

Development of Pharmacotherapies for the Treatment of Hydrocephalus and Associated Sequelae, *PR221805*

The project aims to develop novel, non-surgical, pharmacological treatments for hydrocephalus, a term for excess accumulation of cerebrospinal fluid in the nervous system that occurs most often as a result of trauma. Shunts, the current treament for hydrocephalus, often fail, resulting in affected individuals requiring dozens of neurosurgeries throughout their lives. Funding from this award helped start the Hydrocephalus Research Center, creating collaborative opportunities for hydrocephalus researchers.

PRODUCTS

Protocol for converting human embryonic cells or induced pluripotent stem cells into functional induced neuron cells, *PR100175*

As published in the journal *Neuron*, this method enables large-scale studies of human neurons.

GeneSwap Approach for the analysis of proteins involved in mitochondrial DNA replication, *PR150220, PR200147 and PR200313*

An initial project established the GeneSwap method for using humanized mouse models to study mitochondrial diseases. Based on this foundational work, two additional PRMRP projects use this method in their studies of mitochondrial diseases.

"Serving as a PRMRP consumer reviewer I have the greatest honor, inspiration and hope. Imparting our patient community's specialized wisdom, experiences and patient voice that's valued equally to clinicians and scientists ensures research is most effective, inclusive and results in the most meaningful outcomes for patients and families. PRMRP funds high-risk high-reward research for conditions and diseases with great need for funding research, providing hope for countless patients, families and communities. I'm forever grateful for my experience as a consumer reviewer for giving meaning, purpose and healing to my experiences and insight as a patient and advocate."

Sarah Tompkins,
EveryLife Foundation for Rare Diseases

RELEVANCE TO MILITARY HEALTH

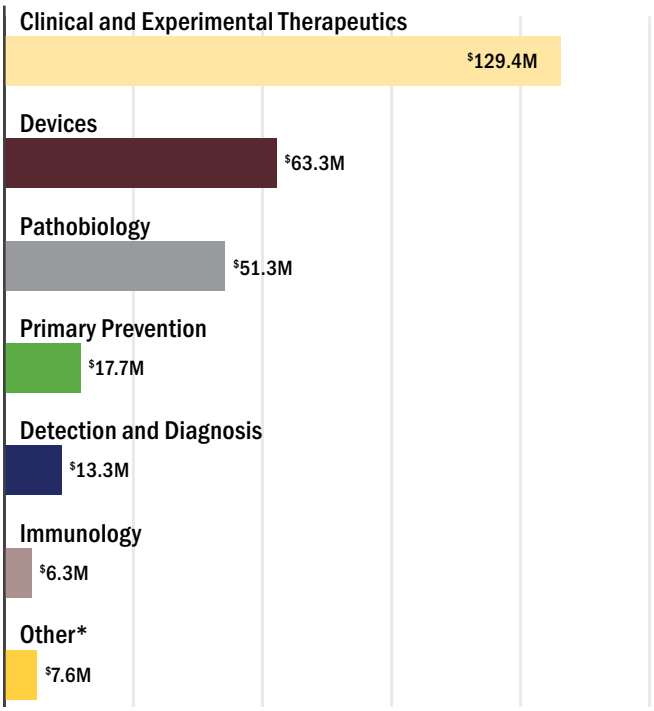
- Rare diseases, which often lack established treatments, impact military readiness, affecting recruitment potential by disqualifying individuals from service, affecting military member's continued ability to serve when disease onset occurs during military tenure, and affecting the readiness and commitment of military Families when these diseases affect DOW beneficiaries.
- Traumatic brain injury presents as a risk factor for development of frontotemporal dementia.[1]
- Researchers identified a connection between traumatic brain injury and subsequent development of dystonia, a disorder characterized by involuntary muscle contractions that cause slow, repetitive movements or abnormal postures.[2]

[1] Raza Z, et al. *Mil Med Res*, 8, 2021:55.

[2] Moon D. *Curr Phys Med Rehabil Rep* 10, 2022:311-323.

$288.9M
FY20-FY24 Investment

FY20-FY24 Awards by Scientific Focus



Other represents investments in Epidemiology, $2.5M; Cell Biology, $2.4M; Biobehavioral Sciences, $2.3M; and Genetics and Molecular Biology, $0.4M.

MAJOR OUTPUTS SINCE INCEPTION

324 Awards	822 Publications	14 Clinical Trial Awards
35 Products Under Development	90 Patents	1 Commercialized Product

FY20-FY23 Topic Areas

- Burn Pit Exposure
- Constrictive Bronchiolitis
- Metals Toxicology
- Proteomics
- Pulmonary Fibrosis
- Respiratory Health
- Trauma

RESPIRATORY HEALTH PORTFOLIO

FY24 Topic Areas
Computational Biology for Precision Health
Proteomics
Pulmonary Fibrosis
Respiratory Health

FY24 Strategic Goals

Foundational Studies

- How airborne hazards cause respiratory injury and disease
- Understand how genetics and immune system activation leads to respiratory distress

Prevention

- Lung injury prevention due to trauma, transfusion, mechanical ventilation, infection and hemorrhagic shock
- Interventions to prevent lung disease following exposure to toxicants
- Methods and devices to minimize population exposure to environmental pollutants

Diagnosis

- Physiological sensors for exposure to airborne hazards and toxins
- Fieldable toolsets to monitor lung dysfunction and failure
- Early detection for respiratory illness
- Biomarkers to diagnose and monitor progression of chronic respiratory diseases

Treatment

- Treatments to slow progression and promote lung repair
- Systems to treat traumatic and acute lung injury in far forward settings
- Methods to facilitate gas exchange

Epidemiology

- Understand the difference in incidence, risk, outcomes and disease progression based on sociologic factors

MAKING AN IMPACT

RESEARCH

Phase 1 and Phase 1/2 Clinical Trials for Treatment of COVID-19-Associated ARDS by AV-001, a Novel Therapeutic Targeting Vascular Endothelium, *PR191212 and PR203503*

AV-001 is a novel therapeutic for the prevention or treatment of moderate-to-severe acute respiratory distress syndrome, or ARDS, in patients hospitalized with viral and/or bacterial respiratory infection. AV-001 received FDA fast track designation in May 2024 to facilitate its development and expedite the review process, potentially accelerating the availability of this therapeutic for Service Members and civilian patients.

Development of BIO 300 Injectable Suspension to Treat Radiation-Induced Lung Injury, *PR211826*

Development of an injectable suspension of BIO 300, a radioprotective drug that provides fast prophylactic projection from radiation injury, would enhance the warfighting mission and operational preparedness in nuclear/radiological threat environments.

PRODUCTS

Extracorporeal immunomodulation with Selective Cytopheretic Device therapy to improve outcomes of inflammatory conditions, *PR150432*

This award supported development of a combat-relevant large animal model of acute lung injury to show the efficacy of the selective cytopheretic device therapy. Thus far, those results led to FDA Emergency Use Expanded Access for severely ill patients diagnosed with COVID-19-related acute respiratory distress syndrome, a prospective pilot trial in patients with COVID-19 or acute kidney injury, Breakthrough Device Designation from FDA and a phase 1 clinical trial for respiratory insufficiency associated with COVID-19 in non-ICU settings.

"Being part of the PRMRP is an honor. As a patient, it brings such hope to understand the research that is being done for earlier diagnoses and better treatments. Being able to review and discuss the research proposals is such a unique opportunity to gain insight to, and provide feedback of, these researchers' efforts to help patients like me. I'm grateful to be part of this process that continues to review and fund such important research."

Heather Kagel,
Pulmonary Fibrosis Foundation

RELEVANCE TO MILITARY HEALTH

- Almost three million American troops deployed to Southwest Asia since 2001 and a large proportion experienced exposure to inhalational hazards including burn pit/trash burning emissions.[1]
- Upon return from combat, U.S. military personnel exhibit a wide range of respiratory disorders, collectively called deployment-related lung disorders.[1]

[1] Garshick E, et al. *Ann Am Thorac Soc* 16, no. 8, 2019:e1-e16.

CLOSED PORTFOLIOS

Congress determines the topic areas for each fiscal year; these topics can change from year to year. To maintain the portfolio-driven approach, the PRMRP occasionally closes portfolios when topic areas no longer align to them. Since FY19, the PRMRP closed three portfolios: Hemorrhage Control and Blood Products, Nutrition and Metabolism and Regenerative Medicine.

HEMORRHAGE CONTROL AND BLOOD PRODUCTS

47	63	2	17	50	1
Awards	Publications	Clinical Trial Awards	Products Under Development	Patents	Commercialized Product

FY20-FY23 Topic Areas:	
Hemorrhage Control	Pathogen-Inactivated Blood Products
Platelet-Like Cell Production	Trauma

Mirasol® Pathogen Reduction Technology System reduces pathogen load and inactivates residual white blood cells in donated fresh whole blood and blood components to reduce transfusion-transmitted infections, *PR033015*

A PRMRP-funded project demonstrated the feasibility of technical improvements to the Mirasol System by increasing throughput to a level sufficient for blood center establishments. A second project then demonstrated efficacy against multiple pathogens and provided information to enhance the riboflavin + ultraviolet light chemistry currently used in the Mirasol PRT system to reduce cellular damage and enhance pathogen kill levels. A currently funded PRMRP award supports an ongoing randomized, double-blinded clinical trial in Uganda testing the efficacy of the Mirasol PRT System to reduce transfusion-transmitted infections using fresh whole blood in anemic patients.

NUTRITION AND METABOLISM

142	236	4	18	28	3
Awards	Publications	Clinical Trial Awards	Products Under Development	Patents	Commercialized Products

FY20-FY22 Topic Areas:	
Diabetes	Nutrition Optimization
Sustained-Release Drug Delivery	

Soldier Water Estimation Tool, SWET, mobile app provides estimated drinking water requirements for Soldier hydration from five simple inputs while minimizing volume of water carried, *PR210463*

The project resulted in a new, simplified sweat prediction algorithm based on two input parameters: wet bulb globe temperature and rate of energy expenditure. The SWET app uses an advanced version of this algorithm that incorporates five parameters.

REGENERATIVE MEDICINE

217	376	5	13	50	0
Awards	Publications	Clinical Trial Awards	Products Under Development	Patents	Commercialized Products

FY20 Topic Areas:
Immunomonitoring of Intestinal Transplants

CLINICAL PIPELINE

Since its inception in 1999, the PRMRP invested in the development and testing of multiple therapies and technologies, many of which continued to advance through further phases of clinical testing. The PRMRP currently supports preclinical technology development efforts as well as clinical trials ranging from phase 1 to phase 4. The list below describes the phase of PRMRP-funded product development efforts, in progress as of FY24.

Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
AUTOIMMUNE DISORDERS AND IMMUNOLOGY						
KB12h, a potential treatment for **rheumatoid arthritis** targeting specific cells involved in joint inflammation without suppressing the immune system	Stephanie Stanford, *University of California, San Diego and Knoubis Bio, Inc.*	■				
A user-friendly app helps track Raynaud attack frequency and severity and symptoms and treatment responses in patients with **scleroderma**	Robyn Domsic, *University of Pittsburgh*	■	■	■	■	
Repurposing of the Apollo™ wearable device to improve fatigue, Raynaud attacks, sleep and depression in patients with **scleroderma**	Robyn Domsic, *University of Pittsburgh*	■	■	■	■	
PAAG17G/MIIST305, a new drug designed to treat **ulcerative colitis** and protect the digestive system from damage caused by exposure to harmful radiation	Shenda Baker, *Synedgen, Inc.*	■	■			
The FDA-approved drug sildenafil repurposed as an early intervention treatment to improve outcomes in **scleroderma** patients with mildly elevated pulmonary pressures	Stephen Mathai, *Johns Hopkins University*	■	■	■	■	
CCF104, a pill that works in the gut to treat **inflammatory bowel disease** by targeting a specific protein involved in inflammation	Thaddeus Stappenbeck, *Cleveland Clinic Foundation*	■				
Micro-basophil activation test, a simple and safe test for diagnosing **food allergies** using advanced technology to provide accurate results	Sindy Tang, *The Leland Stanford Junior University*	■				
All-trans-retinoic acid, a new potential treatment for **rheumatoid arthritis** delivered directly into the joints to help regulate the immune system and provide sustained reductions in inflammation	Nisarg Shah, *Tekhona, Inc.*	■				
Endoprotease-40, a pill to help people with **celiac disease** manage their condition by breaking down gluten in the digestive system	Maria Cristina Comelli, *Enteralia Bioscience, LLC*	■				
CARDIOVASCULAR HEALTH						
Fontan circulation assist device, a small implantable pump helping patients with single ventricle **congenital heart defects** maintain proper blood flow in the long term	William Weiss, *Pennsylvania State University, Milton S. Hershey Medical Center*	■				
Compositional Analysis System by Machine Learning, a tool for analyzing carotid artery plaque to assess **stroke** risk	David Geoffrey Vince, *Cleveland Clinic Foundation*	■	■			
Combination of FDA-approved evirolimus and low-dose tacrolimus to prevent complications like organ rejection and kidney failure in **pediatric heart transplant** patients	Lynn Sleeper, *Boston Children's Hospital*	■	■	■	■	■

■ PRMRP-Funded ■ Supported by Other Sources

Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
ENPP1 antibody to prevent and treat **cardiomyopathy** after a heart attack	Arjun Deb, *University of California, Los Angeles*					
Tissue-engineered vascular graft made from a patient's own cells to improve outcomes in **congenital heart** surgeries	Christopher Breuer, *Research Institute at Nationwide Children's Hospital*					
Mobile fetal cardiac diagnostic platform, a portable tool to improve screening for **congenital heart disease** in unborn babies	Rima Arnaout, *University of California, San Francisco*					
PediaFlow®, a miniature heart pump designed to support infants and children with **congenital or acquired heart disease**	James Antaki, *Cornell University, Ithica*					
Low-force Expanding/Adaptable Pediatric, LEAP™, Valve, a heart valve for **children with heart valve defects** grows with them, reducing the need for multiple surgeries	Corin Williams, *The Charles Stark Draper Laboratory, Inc.*					
Injection of stem cells as treatment to restore heart function in patients with **non-ischemic dilated cardiomyopathy**	Joshua Hare, *University of Miami*					
Repurposing of pazopanib, a drug currently used in cancer treatment to inhibit the formation of new blood vessels, for reducing chronic nosebleeds and improving blood health in patients with **hereditary hemorrhagic telangiectasia**	James Gossage, *Augusta University Research Institute, Inc.*					
Engineered acellular allograft tubes grow with children, reducing the need for multiple heart surgeries in children with **congenital heart disease**	Robert Tranquillo, *University of Minnesota Twin Cities*					
Ozempic®/semaglutide combined with lifestyle modifications to improve heart health in patients with **obesity-related cardiomyopathy**	Barry Borlaug, *Mayo Clinic*					
Clinical decision making guidelines for safely giving blood to **critically ill children on life support**	Lynn Sleeper, *Boston Children's Hospital*					
Sound waves and targeted bubbles, also called sonothrombolysis with microbubbles, a treatment to break up blood clots in **heart attack** patients	Emmanuelle Meuillet, *Micorvascular Therapeutics, LLC*					
Stem cells from the umbilical cord as treatment to improve heart function in patients with **heart failure**	Roberto Bolli, *University of Louisville Research Foundation, Inc.*					
A ready-to-use shear-thinning biomaterial stops bleeding and controls hemorrhagic bleeding in patients with **vascular malformations**	Bhanu Prasanth Koppolu, *Boston Scientific Neuromodulation Corporation*					
A less-invasive heart pump, the slippery hydrophilic coated left ventricular assist device, or SLIC LVAD, to reduce complications, such as blood clots and infections, in patients with **severe heart failure**	Lakshmi Dasi, *Georgia Tech Research Corporation*					

PRMRP-Funded

Supported by Other Sources

Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
HEMORRHAGE CONTROL AND BLOOD PRODUCTS						
Mirasol® pathogen reduction technology reduces **transfusion-transmitted infections** by decreasing harmful pathogens and activated white blood cells in donated blood	Terry Cussen, *Terumo BCT, Inc.* Aaron Tobian, *Johns Hopkins University* Raymond Goodrich, *Colorado State University*	■	■	■		
HemoDefend-BGA™ technology removes type-specific antibodies from donated blood while keeping beneficial substances intact, creating **universal plasma and low-titer O blood for transfusions**	Maryann Gruda, *CytoSorbents, Inc.*	■	■			
Smart-Sensing Hemorrhage Control and Resuscitative Catheter, or SHARC, to enable precise blood flow for partial resuscitative endovascular balloon occlusion of the aorta to manage **severe bleeding in emergency situations**	Patricia Carlisle, *Prytime Medical Devices, Inc.*	■				
Lyophilized SynthoPlate, a portable synthetic platelet treatment for controlling **bleeding resulting from combat injuries**	Anirban Sen Gupta, *Case Western Reserve University*	■				
HemoSeal™, a treatment using platelet-like nanoparticles helps blood clot and stabilizes bleeding in patients with severe **trauma**	Anirban Sen Gupta and Ashley Brown, *Case Western Reserve University*	■				
The Spytag/Spycatcher blood collection system quickly converts fresh donor blood into **universal blood for transfusions**	Stephen Withers, *University of British Columbia*	■				
A clinical decision support tool, the Automated Processing of the Physiological Registry for Assessment of Injury, or APPRAISE, System to help doctors manage bleeding and lung health in **trauma** patients	Andrew Reisner, *Massachusetts General Hospital*	■	■	■	■	
LIFEDUST™, a field-ready, injectable expanding powder stops internal bleeding and helps stabilize **patients with severe injuries** during the prehospital window in a resource limited setting	Matthew Dowling, *Remedium Technologies, Inc. and Medcura, Inc.* David King, *Massachusetts General Hospital*	■	■			
An automated controller for partial resuscitative endovascular balloon occlusion of the aorta uses electronic blood pressure controls to manage blood flow and **treat severe bleeding in prehospital settings**	David Baer, *Prytime Medical Devices, Inc.*	■				
Tranexamic acid plus blood products administered within 24 hours of injury to improve outcomes in **prehospital casualty care** settings	Nee-Kofi Mould-Millman, *University of Colorado at Denver*	■	■	■	■	■
A novel cocktail of treatments targeting the innate immune system, nomacopan + PMX205 + CX-01 + ethyl pyruvate, given at the time of injury to reduce complications and improve survival after **trauma-related bleeding**	Yansong Li, *The Geneva Foundation*	■				
A protein mixture of hemopexin, haptoglobin and transferrin to detoxify stored blood and improve its safety for treating **injured Warfighters**	Andre Palmer, *The Ohio State University*	■				

■ PRMRP-Funded ■ Supported by Other Sources

Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
ErythroMer™, a portable artificial red blood cell transports oxygen and improves outcomes for resuscitation of **hemorrhagic shock**	William McGhee, *KaloCyte, Inc.*	■				
A rugged device for use in the military to detect and manage blood clotting problems in **trauma patients**	Nithya Kasireddy, *Levisonics, Inc.*	■				
OdinSol®, a **blood preservation** product, simplifies storage without the need for complex facilities or harmful chemicals	Xu Han, *CryoCrate, LLC*	■	■			
A wearable device detects and tracks **internal bleeding or hypovolemic shock** by analyzing blood pressure signals	Morten Jensen, *University of Arkansas*	■				
GJA1-20k, an injectable peptide, protects cells from damage caused by **blood loss**	Guillaume Hoareau, *University of Utah*	■				
INFECTIOUS DISEASES						
The long-lasting ProNeura™ ELQ-331 implant slowly releases an antimalarial drug to provide long-term protection from **malaria** infection	Michael Riscoe, *Portland VA Research Foundation and Oregon Health and Science University*	■				
A new antimalarial drug, ELQ-596, taken as a monthly pill or given as an injection to protect against **malaria** for three-to-six months	Michael Madejczyk, *Walter Reed Army Institute of Research* Michael Riscoe, *Portland VA Research Foundation and Oregon Health and Science University - Portland*	■				
T111, an antimalarial drug, works against both early and later stages of **malaria** infection, offering a single-dose cure and relapse prevention	Jane Kelly, *Portland VA Research Foundation* Brian Vesely, *Walter Reed Army Institute of Research* Brandon Pybus, *The Geneva Foundation*	■	■			
A novel **HIV** vaccine combines DNA and protein to treat or prevent infection	Gary Matyas, *Walter Reed Army Institute of Research*	■	■	■	■	
ISLA-101, a novel antiviral drug to treat **dengue fever**	Alan Rothman, *University of Rhode Island* Jeffrey Currier, *Walter Reed Army Institute of Research* Stephen Thomas, *State University of New York Upstate Medical University*	■	■	■	■	

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Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
A cutting-edge imaging technique to track individual **dengue** virus particles inside live cells	Shirit Einav, *The Leland Stanford Junior University* John Dye, *U.S. Army Medical Research Institute of Infectious Diseases*	■				
BRD5018, a single-dose antimalarial drug targets all stages of **malaria** infection with low risk of resistance	Stuart Schreiber, *Broad Institute* Fabian Gusovsky, *Eisai, Inc.*	■				
A set of **malaria** vaccines, PfSPZ vaccines, given with antimalarial drugs to protect against *Plasmodium falciparum* and *Plasmodium vivax*	Stephen Hoffman, *Sanaria, Inc.*	■	■	■	■	
Yeast interfering RNA-based pesticides, a mosquito control method to prevent **mosquito-borne diseases**	Molly Duman Scheel, *Indiana University, Indianapolis* David Severson, *University of Notre Dame*	■				
M2-deficient single replication, or M2SR, flu vaccine provides protection against multiple strains of **influenza**	Pamuk Bilsel, *FluGen, Inc.*	■	■	■	■	
CPZEN-45, an aerosol treatment for **tuberculosis** delivers medication directly to the lungs	Gail Cassell, *Pai Life Sciences, Inc.*	■	■			
The Antigen Reactivity Characterization by Antibody-Dependent Entry, or ARCADE, a diagnostic technique to check blood for antibodies against **hundreds of pathogens** simultaneously	Michael Birnbaum, *Massachusetts Institute of Technology*	■				
Sm-TSP-2/Al, a hydrogel vaccine to protect against **schistosomiasis**	David Diemert, *George Washington University*	■	■	■	■	
IDB002, an antibody treatment prevents and treats **Zika** virus infections	Charles Haines, *IDBiologics, Inc.*	■	■			
A blood test, TB protein assay, quickly detects **tuberculosis** to diagnose and monitor treatment response	Ye Hu, *Tulane University*	■				
Inulin supplementation, a prebiotic fiber, helps prevent **infections caused by antibiotic-resistant bacteria** in patients in the intensive care unit	Daniel Freedberg, *Columbia University Medical Center*	■	■	■	■	
Clofazimine, an FDA-approved treatment for leprosy, repurposed as an antiviral that also reduces inflammation in **COVID-19** patients	Sumit Chanda, *Scripps Research Institute*	■				
A portable device can detect **hepatitis B** infection from a small blood sample	Johann deSa, *Instadiagnostics, Inc.*	■				
A rapid field-diagnostic test detects infections such as **dengue virus, chikungunya virus, Zika virus, malaria, leptospirosis and plague** from a finger stick blood sample	Kevin Schully, *Naval Medical Research Center*	■	■	■		

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Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
INtegrated diagnostic for Sepsis Pathogens and Immune Response Evaluation, or INSPIRE, a portable and fieldable diagnostic tool can detect **sepsis-related infections and antibiotic resistance and predict severe outcomes in subjects with sepsis-associated respiratory dysfunction** in just four hours	Danett Bishop, *Naval Medical Research Center*	■	■	■		
Purgo Pouch, a device for delivering and sustaining high doses of antibiotics directly near an open fracture to prevent or treat **bacterial infections**	Dustin Williams, *University of Utah*	■	■			
Flavopiridol, an FDA-approved orphan drug with antiviral and anti-inflammatory properties repurposed to treat **COVID-19**	Dominik Haudenschild, *University of California Davis*	■				
Point-of-care tests, run on the Franklin® ISP platform, use biomarkers to detect **viral infections** before the appearance of symptoms and to distinguish between bacterial and viral infections	Chris Woods, *Duke University*	■				
A handheld device, CoagCare, screens for blood clotting problems, including those seen in **COVID-19** patients	Ramkumar Abhishek, *Abram Scientific, Inc.*	■	■			
DF-COV, a biologic injection to treat and prevent **COVID-19** while also reducing complications like **acute respiratory distress syndrome**	Gordon Freeman, *Dana-Farber Cancer Institute*	■				
An RNA-based vaccine, CARG-301, to treat chronic **hepatitis B**	Valerian Nakaar, *CaroGen Corporation*	■	■	■	■	
A monoclonal antibody and vaccine combination to protect against **malaria**	Sheetij Dutta, *Walter Reed Army Institute of Research*	■				
SARS-CoV-2 ferritin nanoparticle vaccine delivered with a microneedle patch uses dissolvable microneedles to prevent infection	Louis Falo, *University of Pittsburgh*	■	■			
LMN-201, a spirulin-based oral treatment for ***Clostridium difficile*** infections also prevents recurrence	Carl Mason, *Lumen Bioscience, Inc.*	■	■	■	■	■
A microelectronic **tuberculosis** diagnostic test uses a single drop of blood or urine to identify small amounts of bacterial antigens	Antonino Catanzaro, *University of California, San Diego*	■				
INTERNAL MEDICINE						
Nano-imiquimod therapy, a sustained-release treatment delivers medication directly to tumors to enhance the effects of immunotherapy for **bladder cancer**	Kit Lam, *University of California, Davis*	■	■			
Pelvic floor physical therapy for **interstitial cystitis/bladder pain syndrome**	Kenneth Peters, *William Beaumont Hospital Research Institute*	■	■	■	■	
Pirfenidone, an FDA-approved drug repurposed to reduce the severity of **acute pancreatitis** and to prevent **chronic pancreatitis** in patients with **acute recurrent pancreatitis**	Vikas Dudeja, *University of Miami, Coral Gables and University of Alabama at Birmingham*	■	■	■	■	
Simvastatin, an FDA-approved drug repurposed to reduce symptoms and improve outcomes for patients with recurring **acute or chronic pancreatitis**	Stephen Pandol, *Cedars-Sinai Medical Center*	■	■	■	■	

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Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
A urinary microbial biomarker test to diagnose **interstitial cystitis/ bladder pain syndrome** and predict response to treatments	Anne Ackerman, *Cedars-Sinai Medical Center and University of California, Los Angeles*	■				
Improved methods for transplanting a patient's own pancreatic islet cells following removal of the pancreas to improve blood sugar control and treat **chronic pancreatitis**	Gregory Beilman, *University of Minnesota Twin Cities*	■	■	■	■	
Rituximab and plasmapheresis as a combination treatment to prevent **focal segmental glomerulosclerosis** recurrence in patients undergoing kidney transplants	Michelle Rheault, *University of Minnesota Twin Cities*	■	■	■	■	■
Endoscopic retrograde cholangiopancreatography with pancreatic endotherapy, a minimally invasive procedure to treat blockages, reduce pain and improve quality of life in patients with **chronic pancreatitis**	Badih Elmunzer, *Medical University of South Carolina*	■	■	■	■	
Cabergoline, an FDA-approved drug repurposed to provide non-hormonal relief from chronic pelvic pain for women with **endometriosis**	Amy DiVasta, *Boston Children's Hospital*	■	■	■	■	
A new formulation of calcineurin inhibitors for use with contrast dye for endoscopic retrograde cholangiopancreatography procedures to prevent post-procedure **pancreatitis**	Sohail Husain, *The Leland Stanford Junior University*	■	■			■
An **interstitial cystitis** risk score diagnostic test uses urine samples to identify and classify patients with bladder pain	Bernadette Zwaans, *William Beaumont Hospital Research Institute*	■				
A transforming powder wound dressing stays in place for up to 30 days, reducing care burden for patients with **pressure injuries**	Lawrence Lavery, *ULURU, Inc.*	■	■	■	■	■
2-Deoxy-D-Glucose, a pill to slow the progression of **polycystic kidney disease**	Alessandra Boletta, *Ospedale San Raffaele*	■	■			
Metformin, an FDA-approved drug repurposed to protect kidney cells and improve outcomes for patients with **focal segmental glomerulosclerosis**	Madhav Menon, *Yale University*	■	■	■	■	
The Droplette Micromist Technology Device, a handheld, needle-free device delivers treatments directly to deep tissues to heal **pressure ulcers** and prevent recurrence	Lakshmidevi Pulakat, *Tufts Medical Center*	■				
ROBO2/SLIT inhibitors, non-steroid treatments targeting specific kidney cells to manage **nephrotic syndrome** without suppressing the immune system	Weining Lu, *Boston Medical Center*	■				
Propranolol, an FDA-approved drug to prevent post-surgery chylothorax, a **lymphatic complication** occuring after corrective surgery for **congenital heart disease**	June Wu, *Columbia University Medical Center*	■	■	■	■	
A lightweight, battery-powered, wearable artificial kidney provides continuous dialysis for patients with **end-stage kidney disease**	Victor Gura, *Wearable Artificial Organs, Inc.*	■				
A mobile hemodialysis device using photo-oxidation to improve health outcomes and quality of life for patients with **kidney failure**	Theodore Hart, *Brooke Army Medical Center*	■	■			

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Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
NEUROSCIENCE AND BEHAVIORAL HEALTH						
An artificial intelligence-powered app, 2B-Alert, provides personalized recommendations to manage **sleep deprivation** and increase alertness, including customized caffeine schedules	Gregory Belenky, *Walter Reed Army Institute of Research* William Kilgore, *University of Arizona*	■		■		■
The evidence-based intervention toolkit, a training resource for behavioral health providers to help Service Members improve **mental health**, relationships, **sleep** and **stress** management	Amy Slep, *Stony Brook University and New York University* Richard Heyman, *Stony Brook University*			■	■	■
Etanercept, an FDA-approved drug repurposed to reduce symptoms of **tinnitus** caused by blast injuries	Jinsheng Zhang, *Wayne State University* Shaowen Bao, *University of Arizona*	■			■	
Botox® or BTRX-335140, a kappa opioid receptor antagonist, to relieve **persistent headaches after traumatic brain injury** and improve **sleep**	Rajesh Khanna and Frank Porreca, *University of Arizona*	■				
Dynamic attentional control, a framework for investigating resilience to and managing **stress and sleep deprivation**	Hans Van Dongen, *Washington State University, Pullman*	■				
D-Cycloserine, an FDA-approved drug repurposed to treat **chronic low back pain**	Thomas Schnitzer, *Northwestern University*				■	
Sustained-release naltrexone to treat **PTSD and alcohol use disorder** without daily pills	Brian Shiner, *Veterans Education and Research Association of Northern New England, Inc.*			■		
An online training platform, CBTIweb.org, for providers to learn cognitive behavioral therapy to treat **insomnia**	Daniel Taylor, *University of Arizona* Thomas Parsons, *Arizona State University*	■			■	
Doxazosin, an FDA-approved drug repurposed to reduce **nightmares and sleep disturbances in people with PTSD**	Anne Richards, *Northern California Institute for Research and Education*				■	
A sleep aid, ACT462206, repurposed to prevent **sleep and behavioral changes after traumatic brain injuries**	Rama Maganti, *University of Wisconsin-Madison*	■				
A targeted nanoparticle-encapsulation technique to deliver pain-relief medications for **inflammatory bowel disease and post-traumatic headache**	Nigel Bunnett and Brian Schmidt, *New York University*	■				
Sprint® Peripheral Nerve Stimulation System, a small device implanted near nerves delivers a safe electrical stimulation to provide **long-term pain relief**	Joseph Boggs, *SPR Therapeutics, Inc.*		■		■	
The Brief Assessment of Stress and Eating, or BASE, a screening tool to identify Veterans and Service Members at risk for **eating disorders**	Kelsie Forbush, *University of Kansas Center for Research, Inc.*			■		

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Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
Erenumab, an FDA-approved drug repurposed to prevent **persistent headaches caused by mild traumatic brain injuries**	Todd Schwedt, *Mayo Clinic and Foundation, Scottsdale*				■	
A surgically implanted device uses gentle electrical stimulation to reduce **severe chronic tinnitus**	Matthew Carlson, *Mayo Clinic*				■	
Novel strategically substituted agmatines as an alternative to opioids for the treatment of **chronic neuropathic pain**	Carolyn Fairbanks, *University of Minnesota Twin Cities*		■			
CBTnighmares.org, an interactive online training program for providers to treat **nightmares** using cognitive behavioral therapy	Kristi Pruiksma, *University of Texas Health Science Center at San Antonio*	■				
A therapist-led telehealth program to help Service Members and Veterans manage **eating disorders** like bulimia and binge eating	Robin Masheb, *VA Connecticut Research and Education Foundation*				■	
Mindfulness-Oriented Recovery Enhancement, or MORE, an eight-week program uses mindfulness techniques to **reduce pain and reliance on opioids** for Veterans and military personnel following a **knee replacement**	Eric Garland, *University of Utah*				■	■
Combined cognitive behavioral therapy, a cognitive behavioral therapy with relaxation program tailored for military personnel to treat **migraines, post-traumatic headache and PTSD**	Donald McGeary, *University of Texas Health Science Center at San Antonio*				■	■
Group brief cognitive behavioral therapy, a group therapy program to help Service Members improve mental health and **reduce suicidal thoughts and behaviors**	Robert Cramer, *University of North Carolina at Charlotte*					■
Aviva App, a smartphone app delivers brief cognitive behavioral therapy to reduce suicidal thoughts and **prevent suicide attempts**	Craig Bryan, *The Ohio State University*				■	
Crisis response planning strategies to help non-treatment-seeking Service Members at risk of **suicide** by creating personalized plans to manage crises	Craig Bryan, *The Ohio State University*				■	■
A two-session telehealth program with a mobile app to deliver cognitive behavior therapy to improve resilience and promote safe gun storage to **reduce suicide risk** in Service Members	Craig Bryan, *The Ohio State University*				■	
Cryoneurolysis for post-mastectomy pain, a single ultrasound-guided treatment uses cold therapy to eliminate **pain after breast surgery**	Brian Ilfeld, *University of California, San Diego*				■	
Early administration of fresh frozen plasma to reduce brain damage and improve recovery after **traumatic brain injuries**	Hasan Alam, *Northwestern University*				■	■
BCBTweb, an online provider training program to teach **suicide prevention** techniques, like brief cognitive behavioral therapy and crisis response planning	Justin Baker, *The Ohio State University*	■				
Cognitive behavioral therapy plus written exposure therapy to treat co-occurring **insomnia, nightmares and PTSD**	Carmen McLean, *Veterans Health Administration - Palo Alto, CA*				■	

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Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
A single ultrasound-guided cryoneurolysis treatment reduces pain and the need for opioids after **thoracic trauma**	Brian Ilfeld, *University of California, San Diego*				■	
Relaspen, a fast-acting nasal spray provides relief from acute **migraine** symptoms without addictive properties or harsh side effects	Jonathan Beckwith, *Olfax, LLC*	■				
Transdiagnostic behavior therapy to treat **adjustment disorder** and prevent associated long-term **mental health** conditions in Service Members and Veterans	Ronald Acierno, *University of Texas Health Science Center at Houston*				■	■
Massed crisis response planning for **PTSD** with cognitive processing therapy to **reduce suicidal thoughts and behaviors** in Service Members	Craig Bryan, *The Ohio State University*					■
SRX251 to reduce brain swelling and inflammation caused by mild or repetitive **traumatic brain injuries** in battlefield or hospital settings	Neal Simon, *Azevan Pharmaceuticals, Inc.*	■				
Using the HALO BassiNest® Swivel Sleeper 3.0, a smart bassinet, to prevent or mitigate **postpartum mood disorders** by improving sleep quality of the baby, and therefore, the mother	Michele Okun, *University of Colorado Colorado Springs*					■
NE3107, a pill reducing brain inflammation and treating the neurological symptoms of **Long-COVID**, such as fatigue, sleep disorders and thought-processing issues	Joseph Palumbo, *BioVie, Inc.*				■	
A program to help Service Members improve sleep quality to **reduce suicide risk**	Emily Schmied, *San Diego State University*				■	
Nerve tape to **repair damaged nerves** without the need for stitches	Jonathan Isaacs, *Virginia Commonwealth University*	■				
A blood test during pregnancy uses the Enlighten device to test for a panel of biomarkers to predict a woman's risk of developing **postpartum depression**	Zachary Kaminsky, *Dionysus Digital Health, Inc.*				■	
A therapy program pairs Veterans with service dogs to enhance standard exposure therapy treatment for **PTSD**	Marguerite O'Haire, *University of Arizona*				■	
Transcranial magnetic stimulation, a non-invasive brain stimulation therapy guided by MRI to reduce neurological symptoms of **Long-COVID**	Davin Quinn, *University of New Mexico Health Sciences Center*				■	
A telehealth program provides sleep testing, treatment, education and support for **obstructive sleep apnea** from certified sleep health educators	Emerson Wickwire, *University of Maryland, Baltimore*				■	
Adding frequency-filtered music to cognitive processing therapy sessions to improve treatment outcomes for **PTSD**	Jacek Kolacz, *The Ohio State University*				■	
Adaptive transcutaneous magnetic stimulation, a personalized, non-invasive therapy uses magnetic fields to improve **traumatic peripheral neuropathic pain**	Albert Leung, *Veterans Medical Research Foundation of San Diego*				■	
A single injection of valproic acid given early after a **traumatic brain injury** to protect the brain and improve recovery	Hasan Alam, *Northwestern University*				■	■

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Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
NUTRITION AND METABOLISM						
RAGE229 + SGLT2 inhibitor, a medication cocktail to reduce inflammation and protect against kidney and heart complications in people with **type 2 diabetes**	Ann Marie Schmidt and Ravichandran Ramasamy, *New York University School of Medicine*	■				
Using the CRISPR gene-editing technique to enhance fat cell function to improve blood sugar control and reduce liver fat to treat **type 2 diabetes**	Michael Czech and Silvia Corvera, *University of Massachusetts Medical School*	■				
A self-adhesive patch delivers medication to the eye through a microneedle array to treat **diabetic retinopathy and age-related vision problems**	Kuen-Ren Chen, *Washington State University*	■				
A lifestyle program combining time-restricted feeding and light therapy to help people with **type 2 diabetes** improve blood sugar control by aligning eating and sleeping patterns	Courtney Peterson, *University of Alabama at Birmingham*	■	■	■	■	
Nicotinamide mononucleotide supplementation to boost energy and reduce inflammation in people with **prediabetes**	Samuel Klein, *Washington University*	■	■	■	■	
A combination of oral medications, GLP1R and NPY-1/2R peptide therapy, to improve blood sugar control, promote weight loss, and support healthy insulin-producing cells for management of **type 2 diabetes**	Christian Roth, *Seattle Children's Research Institute*	■				
A gene-silencing treatment, delivered directly to tissues, to improve blood flow and wound healing in patients with **severe diabetic wounds or limb ischemia**	Chandan Sen, *Indiana University, Bloomington*	■				
StructurEd Nutrition Delivery Pathway, or SeND Home, a personalized nutrition plan helps patients recover faster and improve quality of life after a **major abdominal injury**	Paul Wischmeyer, *Duke University*	■	■	■	■	
Ketone diet to improve physical and mental performance, heart health, and kidney function in Service Members experiencing **sleep disruption and to protect against exercise-induced stress**; also benefits patients with **diabetes, heart failure with preserved ejection fraction, or polycystic kidney disease**	Jeff Volek, *The Ohio State University*	■	■	■	■	
ORTHOPAEDIC MEDICINE						
A sustained-release formulation of flavopiridol injected into an injured joint to reduce damage and inflammation and prevent **post-traumatic osteoarthritis**	Dominik Haudenschild, *University of California, Davis*	■	■			
Repurposing of tranexamic acid, an FDA-approved drug, to prevent or delay onset of **post-traumatic osteoarthritis** in patients with anterior cruciate ligament injuries	Constance Chu, *The Leland Stanford Junior University*	■	■	■	■	
An active feedback gait training program to help patients adjust their walking to reduce knee stress and prevent **post-traumatic osteoarthritis** after anterior cruciate ligament reconstruction	Constance Chu, *The Leland Stanford Junior University*	■	■	■	■	
A gene therapy treatment to deliver a protein directly into the joints to reduce inflammation and potentially stop or reverse **post-traumatic osteoarthritis**	Constance Chu, *The Leland Stanford Junior University*	■				

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Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
Blood flow restriction training, a therapy using controlled pressure on the legs, either alone or combined with early knee fluid removal and saline injections, to improve recovery and prevent **post-traumatic osteoarthritis** after a kneecap dislocation	Caitlin Conley, *University of Kentucky*					
Repurposing cilastatin to help protect the kidneys from damage caused by **severe muscle injury or rhabdomyolysis**	Michael Hutchens, *Oregon Health and Science University*					
Nickel-titanium midfoot fusion device to help bones heal and fuse together in people with **diabetic Charcot foot**	David Safranski, *MedShape, Inc.*					
Injection of helper-dependent adenovirus vector into the joint produces proteins to reduce inflammation and provide long-term protection against **osteoarthritis**	Brendan Lee, *Baylor College of Medicine*					
OsteoAdapt™ SP advanced bone graft, a bone implant slowly releases a proprietary bone growth variant to improve bone healing following **traumatic extremity or spine injury**	Luis Alvarez, *Theradaptive, Inc.*					
HyTEC biodegradable implant releases a bone growth protein to support new bone growth to heal **musculoskeletal injuries**	Yunzhi Peter Yang, *The Leland Stanford Junior University*					
Injection of CX-011 into the joint to reduce the inflammation and damage caused by mild to moderate **osteoarthritis**	Hassan Serhan, *CarthroniX, Inc.*					
Physical therapy guidelines to help people recover faster, improve movement and reduce pain after **neck surgery**	Kristin Archer, *Vanderbilt University Medical Center*					
Patient-Matched Ankle Truss System™, a personalized **ankle replacement** uses advanced software to guide bone healing through mechanical design	Ali Kiapour, *4Web, Inc.*					
RESPIRATORY HEALTH						
A continuous infusion therapy with microparticles delivers oxygen to stabilize patients with **severe lung injuries, airway blockages or cardiac arrest**	John Kheir, Brian Polizzotti and John Kheir, *Boston Children's Hospital*					
Multi-frequency oscillatory ventilation, a novel hybrid ventilator uses gentle, controlled airflow to protect the lungs and help patients recover from **acute respiratory distress syndrome**	David Kaczka, *University of Iowa*					
BIO 300, or genistein, a treatment to help prevent or heal **lung damage** caused by respiratory illnesses or radiation exposure	Michael Kaytor, *Humanetics Corporation*					
A nitric oxide-generating metal organic framework extracorporeal life support system to improve treatment for **combat casualties with acute lung injury or acute respiratory distress syndrome**	Andriy Batchinsky, *U.S. Army Institute of Surgical Research*					
A6-5188, a first-in-class ARF6 inhibitor for treatment or prevention of **acute respiratory distress syndrome**	Alan Mueller, *Navigen, Inc.*					
NuP4, a drug to help treat chronic lung diseases such as **asthma and COPD**, as well as **lung damage** after viral infections	Michael Holtzman, *Washington University*					

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XFB-19, an inhalable treatment for **idiopathic pulmonary fibrosis**	Mario Chojkier, *Xfibra, Inc.*					
ETI-039, a pill to help treat **idiopathic pulmonary fibrosis** by targeting a specific protein to reduce lung damage	Stephanie Venn-Watson, *Epitracker, Inc.*					
GP532, a new treatment for **idiopathic pulmonary fibrosis and interstitial lung disease**	Andrei Gudkov, *Genome Protection, Inc.*					
Therapeutic hypothermia plus neuromuscular blockade to prevent shivering as a new treatment for **acute respiratory distress syndrome**	Jeffrey Hasday, *University of Maryland, Baltimore*					
VT-109, a drug to reduce **lung swelling and inflammation** in COVID-19 patients	Yulia Komarova, *University of Illinois at Chicago*					
Berzosertib, a medication targeting DNA repair pathways to fight viruses, including **SARS-CoV-2**	Brigitte Gomperts, *University of California, Los Angeles*					
Vadadustat, a pill activating natural protective processes in the body to help prevent or treat **acute respiratory distress syndrome** in hospitalized patients with COVID-19	Holger Eltzschig, *University of Texas Health Science Center at Houston*					
L-Citrulline supplementation to improve asthma symptoms, lung function and quality of life for people with **deployment-related asthma**	Fernando Holguin, *University of Colorado Denver*					
AV-001, a treatment mimicing natural proteins to protect blood vessels and help patients recover from **acute respiratory distress syndrome**, including COVID-19-associated ARDS	Ghania Chikh and Brian Jahns, *Vasomune Therapeutics, Inc.*					
ORP100S, an inhalable treatment for **acute respiratory distress syndrome**, including ARDS caused by viral diseases	Peter Heifetz, *OrPro Therapeutics, Inc.*					
VentFree® Respiratory Muscle Stimulator, an electrical stimulation device to help patients regain breathing strength and **transition off ventilators**	Angus McLachlan, *Liberate Medical, LLC*					
Lightweight portable pulmonary assist device provides long-term breathing support for Veterans with **chronic obstructive pulmonary disease** to use at home or for **wounded Warfighters during military transport**	Keith Cook, *Carnegie Mellon University* David Skoog, *Advanced Respiratory Technologies, LLC*					
Telodendrimer nanotrap treatment injected or inhaled in combination with antibiotics to prevent **sepsis and acute respiratory distress syndrome** in combat casualties and civilian trauma	Juntao Luo, *State University of New York Upstate Medical University*					
Extracorporeal carbon dioxide removal support device removes carbon dioxide from the blood, helping patients with **chronic obstructive pulmonary disease** breathe better and live longer	Steven Keller, *Johns Hopkins University*					
CTX-002-DPI, a dry powder inhaler for emergency use by first responders and military personnel to treat **acute lung injuries** caused by trauma or inhaled noxious agents	David Jackson, *Ceria Therapeutics, Inc.*					

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Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
Sotair®, a safety attachment device for manual ventilations, prevents complications from **overventilation**	Prathamesh Prabhudesai, *SafeBVM Corp.*			■		
A driving pressure-limited ventilation strategy to reduce **lung injury** from mechanical ventilation	Sarina Sahetya, *Johns Hopkins University*			■		■
KVX-053, a medication targeting specific proteins to mitigate **acute lung injury**	John Lazo, *Kevirx, Inc.*		■			
A wearable device monitors sweat to predict flare-ups in people with **chronic obstructive pulmonary disease**	Harry Rossiter, *Lundquist Institute for Biomedical Innovation at Harbor-UCLA Medical Center*	■				
Modular total exposure health sensor, a wearable device monitors exposure to **airborne hazards and burn pits**	Mark Cridge, *Cornerstone Research Group, Inc.*	■				
RARE DISEASES AND CONDITIONS						
A "spray-on skin" system to deliver genetically-corrected stem cell-derived skin cells to enhance wound healing in **recessive dystrophic epidermolysis bullosa** patients	Dennis Roop, *University of Colorado Anschutz Medical Campus* Jakub Tolar, *University of Minnesota Twin Cities*	■				
RN1734, a TRPV4 antagonist, alone or in combination with erythropoietin and/or melatonin as treatment for various forms of **hydrocephalus**	Bonnie Blazer-Yost, *Indiana University*	■				
Oral roxadustat plus melatonin as a non-surgical treatment to prevent **post-traumatic hydrocephalus following traumatic brain injury** by promoting recovery of cerebrospinal fluid dynamics and brain repair	Shenandoah Robinson and Lauren Jantzie, *Johns Hopkins University*	■				
Combining two oral drugs, FDA-approved ritonavir and a novel compound, to treat **dystonia** by modifying the integrated stress response	Nicole Calakos, *Duke University* Matthew Hall, *National Center for Advancing Translational Sciences*	■				
A device using resonance Raman spectroscopy and easy-to-access tissues, such as tongue or cheek, to detect shock states for **resuscitation and triage** decisions, and potentially assess the efficacy of therapeutics targeted at **mitochondrial dysfunction**	John Kheir, *Boston Children's Hospital*	■				
An engineered form of the naturally occurring, anti-scarring human protein decorin, delivered via topical gel or intravenously, to accelerate wound healing and reduce scarring in **dystrophic epidermolysis bullosa** patients	Hal Landy, *FIBRX Tissue Repair, Inc.*		■			
N-acetylcysteine, an antioxidant nutritional supplement, as a treatment for **mitochondrial encephalomyopathy, lactic acidosis and stroke-like episodes, or MELAS**	Michio Hirano, *Columbia University Medical Center*			■	■	
Tributyrin, a butyrate prodrug, to induce mitochondrial reprogramming and improve clinical signs and symptoms in **MELAS and Leber's hereditary optic neuropathy-Plus** patients	Anne Chiaramello, *George Washington University*	■				

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Product Description	PI, Organization	Pre-Clinical	Pre-IND/IDE	Phase 1	Phase 2	Phase 3/4
Zwitterionic ventricular catheter, which uses a special coating to reduce the buildup of proteins and other deposits on the catheter, to prevent shunt failure in **hydrocephalus** treatment	Andrew Sinclair, *Taproot Medical Technologies, LLC*					
Periodic acceleration-passive motion exercise using the pGz motion platform bed and Gentle Jogger® device for therapy and monitoring muscle mitochondrial function in **primary mitochondrial disease** patients	Marni Falk, *Children's Hospital of Philadelphia*					
Spinal injection of AS-202, a type of drug that can alter RNA and target PIKFYVE enzymes, as a therapeutic for multiple forms of **frontotemporal dementia**	Justin Ichida, *University of Southern California* Peter Sazani, *AcuraStem, Inc.*					
LYT-300, pill form of the naturally occurring neurosteroid allopregnanolone, as a treatment for individuals with **Fragile X-associated tremor or ataxia syndrome** who carry the FMR1 gene premutation	Michael Chen, *PureTech Health, LLC*					
FDA-approved drugs vorinostat, donepezil and ketamine as repurposed treatments for **adolescent girls with Rett syndrome**	Jeffrey Neul, *Vanderbilt University Medical Center*					
ELK-003, eye drops to treat corneal abrasions associated with **epidermolysis bullosa**	Armen Karamanian, *Eliksa Therapeutics, Inc.*					
MultiSense, a wireless diagnostic platform to rapidly and non-invasively assess shunt status in **hydrocephalus** patients	Sascha Lee, *Senseer Health, Inc.*					
PAMSys™ wearable sensor and BioDigit Home™, a remote monitoring solution to detect meaningful changes in the lives of individuals with **frontotemporal lobar degeneration**	Ashkan Vaziri, *BioSensics, LLC*					
FreeFlow, a **hydrocephalus** shunt to reduce clotting, clogging and biofilms, thus reducing shunt failure and the need for replacement for hydrocephalus patients	Todd McFarland, *FreeFlow Medical Devices, LLC*					
REGENERATIVE MEDICINE						
A joint injection using a harmless virus to deliver IL-1Ra gene therapy to combat **osteoarthritis**	Steven Ghivizzani, *University of Florida* Christopher Evans, *Mayo Clinic*					
A transplanted urinary bladder with its own blood supply, accompanying a kidney transplant as a novel intervention for patients facing **genitourinary dysfunction and renal failure**	Patricio Gargollo, *Mayo Clinic*					
Injection of off-the-shelf fat tissue product to reconstruct **large volume soft tissue defects**	Jennifer Elisseeff, *Johns Hopkins University*					
AxoMax®, an off-the shelf nerve guide using a biodegradable conduit containing a controlled drug delivery system to promote the regrowth of **peripheral nerve injuries** greater than one inch	Kacey Marra, *University of Pittsburgh*					
Under the skin injections of tesamorelin, a drug that causes the body to produce increased amounts of growth hormone, to enhance nerve regeneration and functional recovery following **peripheral nerve injuries**	Sami Tuffaha, *Johns Hopkins University*					

PRMRP-Funded

Supported by Other Sources

PRMRP TOPIC AREAS OFFERED AND FUNDED, FY20-FY24

Topic Area	FY20	FY21	FY22	FY23	FY24
Accelerated Aging Processes Associated with Military Service					✓
Arthritis	✓	✓	✓	✓	
Burn Pit Exposure	✓	✓			
Cardiomyopathy		✓	✓		
Celiac Disease				✓	✓
Chronic Migraine and Post-Traumatic Headache	✓				
Computational Biology for Precision Health					✓
Congenital Cytomegalovirus					✓
Congenital Heart Disease	✓	✓	✓		✓
Constrictive Bronchiolitis	✓				
Diabetes	✓	✓	✓		
Dystonia	✓	✓	✓	✓	✓
Eating Disorders	✓	✓	✓	✓	✓
Eczema				✓	
Ehlers-Danlos Syndrome			✓	✓	✓
Emerging Viral Diseases	✓	✓			
Endometriosis	✓	✓	✓	✓	
Epidermolysis Bullosa	✓	✓	✓	✓	✓
Far-UVC Germicidal Light					✓
Familial Hypercholesterolemia	✓	✓	✓	✓	
Fibrous Dysplasia	✓	✓	✓		
Fibrous Dysplasia/McCune Albright Syndrome				✓	✓
Focal Segmental Glomerulosclerosis	✓	✓	✓	✓	✓
Food Allergies	✓	✓	✓	✓	✓
Fragile X	✓	✓	✓	✓	✓
Friedreich's Ataxia			✓		
Frontotemporal Degeneration	✓	✓	✓	✓	✓
Guillain-Barre Syndrome	✓		✓	✓	✓
Hemorrhage Control	✓	✓	✓	✓	
Hepatitis B	✓	✓	✓	✓	✓
Hereditary Ataxia				✓	✓
Hydrocephalus	✓	✓	✓	✓	✓
Hypercholesterolemia			✓	✓	
Hypertension		✓	✓		
Immunomonitoring of Intestinal Transplants	✓				
Inflammatory Bowel Disease	✓	✓	✓	✓	✓
Interstitial Cystitis	✓		✓	✓	✓
Lymphatic Disease				✓	
Lymphedema				✓	✓
Malaria		✓	✓	✓	✓

✓ Offered Funded as a topic area

Topic Area	FY20	FY21	FY22	FY23	FY24
Maternal Mental Health				✓	✓
Metals Toxicology	✓	✓			
Mitochondrial Disease	✓	✓	✓	✓	✓
Musculoskeletal Disorders related to acute and chronic bone conditions and injuries			✓		✓
Musculoskeletal Health	✓				
Myalgic Encephalomyelitis/Chronic Fatigue Syndrome	✓	✓	✓	✓	✓
Myotonic Dystrophy	✓	✓	✓	✓	✓
Nephrotic Syndrome			✓	✓	✓
Neuroactive Steroids				✓	✓
Neuroinflammatory Response to Emerging Viral Diseases				✓	
Non-Opioid Therapy for Pain Management		✓	✓	✓	
Nutrition Optimization	✓	✓	✓		
Orthopedics				✓	
Pancreatitis	✓		✓	✓	✓
Pathogen-Inactivated Blood Products	✓	✓	✓		
Peripheral Neuropathy		✓	✓	✓	✓
Plant-Based Vaccines	✓	✓	✓		
Platelet-Like Cell Production		✓	✓		
Polycystic Kidney Disease	✓	✓	✓	✓	✓
Post-Traumatic Osteoarthritis					
Pressure Ulcers	✓	✓	✓	✓	
Proteomics				✓	✓
Pulmonary Fibrosis	✓	✓	✓	✓	✓
Resilience Training	✓				
Respiratory Health	✓	✓	✓	✓	✓
Rett Syndrome			✓		✓
Rheumatoid Arthritis	✓	✓	✓	✓	
Scleroderma				✓	✓
Sickle-Cell Disease				✓	✓
Sleep Disorders and Restriction	✓	✓	✓	✓	
Spinal Muscular Atrophy	✓				
Suicide Prevention		✓	✓	✓	✓
Sustained-Release Drug Delivery	✓	✓	✓		
Trauma			✓	✓	
Tuberculosis				✓	
Vascular Malformations	✓	✓	✓	✓	✓
Viral Diseases			✓		
Von Hippel-Lindau Syndrome					✓
Von Hippel-Lindau Syndrome benign manifestations				✓	
Women's Heart Disease	✓	✓	✓		

✓ Offered Funded as a topic area

INDEX OF HIGHLIGHTED RESEARCH AND PRODUCTS:

AUTOIMMUNE DISORDERS AND IMMUNOLOGY – PAGE 9
PR210110, Optimized Glycopolymer-Mimicking Polysaccharide to Provide Barrier Function and Restore Gastrointestinal Integrity and Homeostasis in Inflammatory Bowel Diseases, Shenda Baker, Ph.D., Synedgen, Inc., FY21 Expansion Award – Funding Level 3, $4,445,860
PR220071, Gut Symbiont Lipid A Family: Structures and Immunomodulation in Inflammatory Bowel Diseases, Dennis Kasper, M.D., Harvard University, FY22 Expansion Award – Funding Level 3, $4,407,375
PR171811, Optimizing Patient-Reported and Vascular Outcome Measures in Systemic Sclerosis-Associated Raynaud Phenomenon, Robyn Domsic, M.D., University of Pittsburgh, FY17 Investigator-Initiated Research Award, $1,507,660
PR231656, A Randomized, Sham-Controlled, Double-Blind Study Testing the Apollo Device in Systemic Sclerosis for the Management of Fatigue, Raynaud Phenomenon, and Quality of Life: The ASScERT-QOL Trial, Robyn Domsic, M.D., University of Pittsburgh, FY23 Lifestyle and Behavioral Health Interventions Research Award – Clinical Trial, $3,026,001
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PR210137, Development of New Point-of-Care Tools to Assess Cardiovascular Disease Risk for Women Within the Primary Healthcare Setting, Haekyung Jeon-Slaughter, Dallas VA Research Corporation, FY21 Investigator-Initiated Research Award, $1,290,519
PR161603, Women's Ischemia Trial to Reduce Events in Non-Obstructive CAD, WARRIOR, Carl Pepine, M.D., University of Florida, FY15 Clinical Trial Award, $14,927,828
PR211898, Evaluation of the Cardiac and Metabolic Effects of Semaglutide in Heart Failure with Preserved Ejection Fraction, Barry Borlaug, M.D., Mayo Clinic, FY21 Clinical Trial Award, $5,047,034
PR012302, Mosaic Annular Arrays for Portable Ultrasound, Kai Thomenius, Ph.D., GE Research and Development Center, FY01 Investigator-Initiated Research Award, $1,992,742
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PR181960, Prebiotic Inulin to Limit Antimicrobial-Resistant Infections During Critical Illness: A Phase II Clinical Trial, Daniel Freedberg, M.D., Columbia University Medical Center, FY18 Clinical Trial Award, $1,890,421
PR043347, Nucleic Acid Testing Device for the Use at Battalion Aid Stations, Heinz Reiske, Ph.D., IQuum, Inc., FY04 Advanced Technology Award, $1,955,910
PR160433, A Novel Host-Protein POC Platform for Differentiating Bacterial Versus Viral Infections: Transition from Prototype to Product, Eran Eden, Ph.D., MeMed Diagnostics Ltd., FY16 Technology/Therapeutic Development Award, $4,078,628
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PR203478, Evaluation of Pirfenidone as a Therapy in Patients with Predicted Moderate to Severe Acute Pancreatitis, Vikas Dudeja, M.B.B.S., University of Alabama at Birmingham, FY20 Clinical Trial Award – with Planning Phase, $3,083,032
PR203476, An Innovative Wound Management Solution for Reducing Dressing Changes and Burden of Care in the Treatment of Pressure Injuries, Lawrence Lavery, D.P.M., Altrazeal Life Sciences, FY20 Clinical Trial Award, $3,779,680
PR210615, Development of 2-Deoxy-D-Glucose for the Treatment of Polycystic Kidney Disease, Alessandra Boletta, Ph.D., Ospedale San Raffaele s.r.l., FY21 Technology/Therapeutic Development Award – Funding Level 2, $4,343,041
PR012296, MiniRobot Design for Military Telesurgery in the Battlefield: Breaking the Size Barrier for Surgical Manipulators, Blake Hannaford, Ph.D., University of Washington, FY01 Investigator-Initiated Research Award, $1,198,090
PR080163, Nanoscale Proteomic Analysis of Oncoproteins in Hematopoietic Cancers, Dean Felsher, M.D., Ph.D., The Leland Stanford Junior University, FY08 Investigator-Initiated Research Award, $1,437,271
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PR210299, Augmenting Suicide Prevention Interventions for Service Members, ASPIS, Craig Bryan, Psy.D., The Ohio State University, FY21 Focused Program Award, $8,375,496
PR230933, PPD, Preventing Postpartum Depression - A Real-World Examination of a Predictive Test for PPD, Zachary Kaminsky, Ph.D., Dionysus Digital Health, Inc., FY23 Clinical Trial Award, $3,028,589
PR002159, Evoked Otoacoustic Emissions in DOD Hearing Conservation Programs, Lynne Marshall, Ph.D., Naval Submarine Medical Research Laboratory, FY00 Investigator-Initiated Research Award, $1,698,969
PR023109, Biochemical Markers of Brain Injury: An Integrated Proteomics-Based Approach, Ronald Hayes, Ph.D., University of Florida, FY02 Investigator-Initiated Research Award, $2,167,415

PR064667, Biochemical Markers of Brain Injury: An Integrated Proteomics-Based Approach, Ronald Hayes, Ph.D., Banyan Biomarkers, Inc., FY06 Existing Program Project, $1,520,107
PR093961 & PR093961P1, Developing a Mechanistic Understanding to Link ALK Mutations to Prognosis and Therapeutic Inhibitor Choice in Neuroblastoma Patients, Mark Lemmon, Ph.D., University of Pennsylvania, and Yael Mossé, M.D., Children's Hospital of Philadelphia, FY09 Investigator-Initiated Research Award – Partnering PI Option, $1,188,813
PR111043, Phase I Study of Humanized 3F8 Monoclonal Antibody in Patients with High-Risk Neuroblastoma and GD2-Positive Tumors, Nai-Kong Cheung, M.D., Ph.D., Sloan Kettering Institute for Cancer Research, FY11 Clinical Trial Award, $2,680,415
PR991004, A Fatigue Management System for Sustained Military Operations, William Storm, Ph.D., NTI, Inc., FY99 Investigator-Initiated Research Award, $1,680,170
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PR221938, Clinical Study of Sustained-Release Implant for Trauma Repair, Luis Alvarez, Ph.D., Theradaptive, Inc., FY22 Clinical Trial Award – with Planning Phase, $7,408,939
PR054556, Self Managing the Consequences of Major Limb Trauma, Ellen MacKenzie, Ph.D., Johns Hopkins University, FY05 Investigator-Initiated Research Award, $1,007,200
PR110381, Benefits, Harms, and Costs of Osteoporosis Screening in Male Veterans, Cathleen Colon-Emeric, M.D., Institute for Medical Research, Inc., FY11 Investigator-Initiated Research Award, $895,483
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PR221805, Development of Pharmacotherapies for the Treatment of Hydrocephalus and Associated Sequelae, Bonnie Blazer-Yost, Ph.D., Indiana University, FY22 Focused Program Award, $7,806,116
PR100175 & PR100175P1, Testing Synaptic Properties of Human Neurons Derived from Fragile-X Patients, Lu Chen, The Leland Stanford Junior University, and Marius Wernig, M.D., Ph.D., The Leland Stanford Junior University, FY10 Investigator-Initiated Research Award – Partnering PI Option, $483,991
PR150220, Toward Humanized Mouse Models of Mitochondrial Disease, Mikhail Alexeyev, Ph.D., University of South Alabama, FY15 Discovery Award, $302,368
PR200147, Defining the Molecular Composition of the Interspecies Barrier for Mitochondrial DNA Replication, Mikhail Alexeyev, Ph.D., University of South Alabama, FY20 Discovery Award, $308,000
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PR203503, Phase 1 and Phase 1/2 Clinical Trials for Treatment of COVID-19-Associated ARDS by AV-001, a Novel Therapeutic Targeting Vascular Endothelium, Brian Jahns, Pharm.D., Vasomune Therapeutics, Inc., FY20 Clinical Trial Award – with Planning Phase, $6,354,825
PR211826, Development of BIO 300 Injectable Suspension to Treat Radiation-Induced Lung Injury, Michael Kaytor, Ph.D., Humanetics Corporation, FY21 Technology/Therapeutic Development Award – Funding Level 2, $5,132,520
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