VII. Peer Reviewed Medical Research Program

Mission: To support biomedical research with direct relevance to military health.

Congressional Appropriations for Peer Reviewed Research:

- **$144.5M in FY99–02**
- **$50M in FY03**
- **$50M in FY04**

Funding Summary:

- **98 awards from the FY99–02 appropriations**
- **29 awards from the FY03 appropriation**
- **~28 awards anticipated from the FY04 appropriation**

Military Relevance

In their efforts to protect our country, members of the military are subjected to a variety of diseases and injuries that are not commonly encountered by civilians. These include hearing loss due to the extremely loud noises generated by military equipment and explosives; musculoskeletal trauma experienced in times of war and during training exercises; exposure to deadly infectious diseases such as malaria, leptospirosis, leishmania, and hepatitis while deployed in third world countries; and acute lung injury and respiratory complications in members of the military who operate armored vehicles due to short, intermittent, high-level exposures to toxic gases (e.g., carbon monoxide, sulfur dioxide, ammonia, and nitrogen oxides) from engine exhaust and the firing of weapons. Research sponsored by the Peer Reviewed Medical Research Program (PRMRP) aims to preserve the health of our military forces by targeting these and other conditions of high military relevance.

Program Background

The Department of Defense (DOD) PRMRP was established in fiscal year 1999 (FY99) by Appropriations Conference Committee Report No. 105-746, which provided $19.5 million (M) to DOD to establish a medical research program that focused on issues pertinent to U.S. military forces. Congress directed the Deputy Secretary of Defense to work with the Surgeons General of the Services to establish a program to select medical research projects of clear scientific merit and direct relevance to military health. The U.S. Army Medical Research and Materiel Command (USAMRMC) became the Executive Agent for this new program through Joint Services coordination and the specific recommendation of the Armed Services Biomedical Research Evaluation and Management (ASBREM) Committee. The USAMRMC instituted the plan recommended by the ASBREM Committee, one aspect of which required the formation of a Joint Programmatic Review Panel (JPRP) to determine programmatic priorities. The PRMRP JPRP is composed of representatives from the four military services, DOD (Health Affairs), and the Departments of Health and Human Services and Veterans Affairs. The JPRP provides programmatic and strategic direction for the PRMRP and serves as a recommending body to the USAMRMC Commanding General on final funding decisions.

From FY99 to FY04, Congress appropriated a total of $244.5M through the PRMRP to fund peer reviewed research focused on military health. A total of 127 awards have been made through FY03 reflecting the Program's mission to support research with direct relevance to military health. Appendix B, Table B-5, summarizes the directions from Congress for the PRMRP appropriations and the investment strategy executed by the PRMRP for FY03–04.

supporting the warfighter

The Fiscal Year 2003 Program

The PRMRP was continued in FY03 with a $50M congressional appropriation to support peer reviewed research pertinent to the health of military forces. Congress identified 27 topic areas that could be supported by the appropriation. An additional military relevant topic area was continued by the JPRP from previous FYs. A total of 298 proposals were received, and 29 were funded. Table VII-1 provides a summary of the FY03 PRMRP topic areas in terms of proposals received, number of awards, and dollars invested.

A highlight of the FY03 program was the first Military Health Research Forum, a multidisciplinary meeting designed to showcase research progress from FY99–02 PRMRP-supported investigators. Scientists, physicians, and the military came together to learn about the advancements made since the program's inception. Read more about the Military Health Research Forum in the box story on page VII-6.

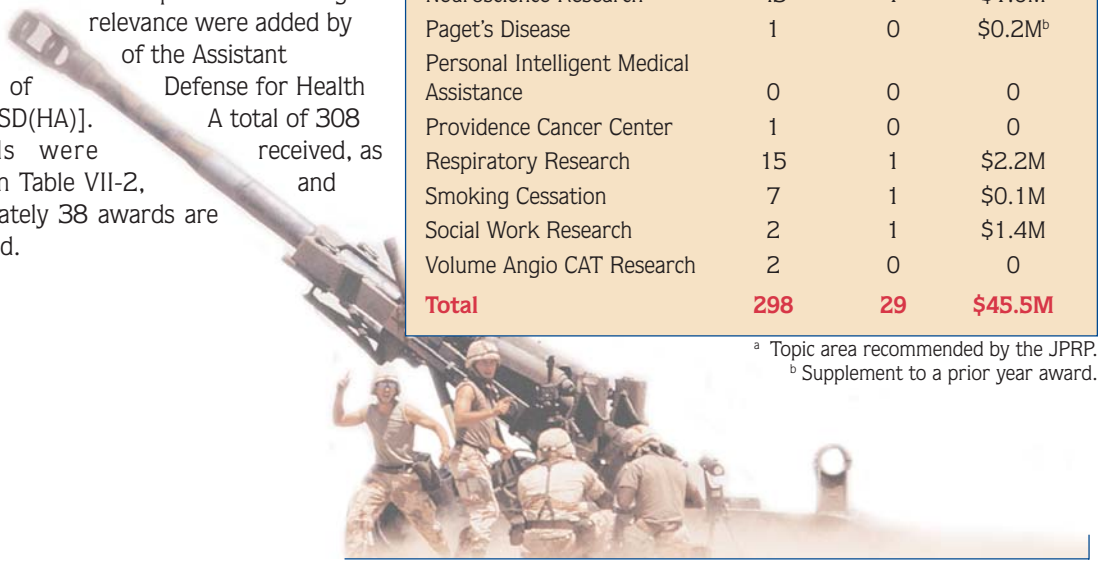
The Business Strategy for the Fiscal Year 2004 Program

Congress appropriated $50M to continue the PRMRP in FY04. The PRMRP requested proposals in 25 topic areas: 22 recommended by Congress (Conference Committee Report No. 107-732, pp. 324–325) and 3 additional topic areas with high military relevance were added by the Office of the Assistant Secretary of Defense for Health Affairs [ASD(HA)]. A total of 308 proposals were received, as detailed in Table VII-2, and approximately 38 awards are anticipated.

Table VII-1. Topic Areas Offered and Proposals Received for the FY03 PRMRP

Topic Area	Proposals	Awards	Investment
Acellular Matrix Research for Military Orthopedic Trauma	4	1	$0.7M
Alcoholism Research	13	1	$1.5M
Amyotrophic Lateral Sclerosis	24	1	$1.2M
Anti-Diarrhea Supplement	3	1	$3.7M
Army Nutrition Research	7	1	$0.6M
Augmented Care in the Chain of Stroke Survival (ACCESS)	1	0	0
Blood-Related Cancer Research	5	0	0
Bone-Related Disease Research	10	1	$0.6M
Casualty Care Research Center	11	2	$1.6M
Cell Response to Anti-Cancer Agents	9	1	$1.5M
Chiropractic Care	0	0	0
Epilepsy	5	1	$1.2M
Infectious Disease Tracking System	9	1	$2.5M
Interstitial Cystitis Research	14	1	$1.0M
Low Vision Research	2	1	$3.0M
Medical Digital Assistance	2	0	0
Military Relevant Disease and Injury[a]	98	12	$21.5M
Miniature Renal Assistance Devices	2	0	0
Mt. Sinai Cancer Research Program	2	0	0
Natural Toxin Detection Technology	6	0	0
Neuroscience Research	43	1	$1.0M
Paget's Disease	1	0	$0.2M[b]
Personal Intelligent Medical Assistance	0	0	0
Providence Cancer Center	1	0	0
Respiratory Research	15	1	$2.2M
Smoking Cessation	7	1	$0.1M
Social Work Research	2	1	$1.4M
Volume Angio CAT Research	2	0	0
Total	**298**	**29**	**$45.5M**

[a] Topic area recommended by the JPRP.
[b] Supplement to a prior year award.



Scientific Outcomes and Advances

Research funded by the PRMRP is already producing tangible products and technology as depicted in Figure VII-1. Many of these outcomes are directly impacting the health of our military forces.

Additional research accomplishments are summarized in this section by topic area, including childhood asthma research, closed-loop frozen blood-processing systems, tobacco cessation research, and wound healing. These accomplishments were recently presented at the PRMRP Military Health Research Forum. (See the box story on page VII-6 for additional information about this meeting.)

Table VII-2. Topic Areas Offered and Proposals Received for the FY04 PRMRP

Topic Area	Proposals
Alcoholism Research	15
Amyotrophic Lateral Sclerosis	30
Anti-Diarrhea Supplement	0
Blood-Related Cancer Research	25
Childhood Asthma	8
Chronic Pain Research	9
Epilepsy	11
Geneware Rapid Vaccine Development	1
Interstitial Cystitis Research	4
Interventional Cardiovascular Magnetic Resonance Imaging Technologies	1
Limb Loss and Paralysis Research	16
Lung Cancer Screening[a]	5
Malaria Vaccine Initiative (SBRI)[b]	1
Military Medical Informatics Research	8
Military Relevant Disease Management[c]	80
Muscle Function Research	20
Muscular Dystrophy	5
Osteoporosis and Bone-Related Disease Research	35
Paget's Disease	0
Post-Traumatic Stress Disorder	21
Providence Cancer Research Project	1
Pseudofollicilitis barbae[a]	0
Reserve Component Medical Training	3
Smoking Cessation[a]	6
Social Work Research	3
Total	**308**

[a] Topic area added by the Office of the ASD(HA).
[b] Seattle Biomedical Research Institute.
[c] With emphasis on malaria, leishmaniasis, and wound infection research.

Childhood Asthma Research

Asthma is the most significant chronic disease of children, and it has a strong impact on military families and military health care. Much of the cost of asthma treatment comes from hospitalizations and emergency room visits to treat acute illness. Thus, developing treatments that prevent asthma attacks is one means to reduce the incidence and costs associated with asthma. Dr. Yoshimi Shibata and colleagues at Florida Atlantic University have identified a promising preventive treatment. Oral administration of tiny particles of chitin, a naturally occurring polymer from shellfish, reduced the allergic response in mice allergic to ragweed. The treatment decreased typical immune responses seen in both allergies and asthma, such as serum levels of immunoglobulin E and eosinophils in the lungs. Through this effort, Dr. Shibata has laid the groundwork for Phase 1 clinical trials of the effects of oral administration of chitin on childhood asthma.

Closed-Loop Frozen Blood-Processing System

Processing, storage, and transportation of blood are associated with significant costs. For the military, remote locations and long periods of stay on board Navy ships represent additional logistical concerns associated with blood processing. Dr. Thomas Robinson and colleagues at Mission Medical, Inc. are developing an instrument, an Advanced Closed-Loop Frozen Blood-Processing System, to provide long-term frozen red blood cell storage and rapid, simple, and automated methods for red blood cell glycerolization and deglycerolization. This system and its subsequent testing demonstrate a major improvement in the efficiency and effectiveness of frozen blood processing. Thus, the Advanced Closed-Loop Frozen Blood-Processing System provides the military with a practical alternative to fresh packed red cells.

Tobacco Cessation Research

Tobacco users have higher attrition rates, lower physical performance, and more lost productivity than nonusers. The U.S. Marine Corps has the highest tobacco use rates of all of the Services, and Marines ages 18–25 years have the highest rate of all age groups in the Service. Linda Trent and colleagues at the Naval Health Research Center saw an opportunity to build on the existing boot camp tobacco ban (all tobacco products are banned during the 3-month recruit training period) to provide both motivational and skills training for continued tobacco abstinence. Two short tobacco-cessation training videos (one shown at the end of basic training and the other about 3 weeks later at the beginning of infantry training) were developed and implemented for 1 year at the Marine Corps Recruit Depot in San Diego, California and the School of Infantry, Camp Pendleton, California to approximately 16,000 graduating recruits. In conjunction with a tobacco-use questionnaire, preliminary data suggest that this minimal, population-based intervention could have important payoffs in reducing tobacco use, thus resulting in improvements in health, performance, and operational readiness.

Wound Healing

Wounds are the inescapable consequence in battle, and impaired healing of war wounds remains a serious problem for the military. In the advancement of genetics, researchers are testing several approaches to apply gene therapy to enhance wound healing. Among those leading the effort is Dr. John Harmon of the Johns Hopkins University, who hypothesizes that electroporation-facilitated gene therapy with growth factors can improve wound healing by delivering growth factors deep within the tissue. The device used is small, compact, and suitable for deployment in a military setting. The technique involves the application of electrical fields to permeabilize the cell membrane and allow the entrance of macromolecules into cells. As a result, the electrical field causes small transient pores to open in the insulating lipid bilayer of the cells' membranes allowing dissipation of potential difference applied and enhancing cell membrane permeability. Using this novel bioengineered gene therapy system in a rodent war wound model, preliminary data from Dr. Harmon's group suggest that the delivery of growth factors by electroporation is a promising model for wound healing.

Bottom Line

Since 1999, the PRMRP has been responsible for managing $244.5M in congressional appropriations. The program has supported 127 exciting medical research projects in 45 military relevant topic areas through FY03 that have direct relevance to the health of members of the active duty military forces, retirees, and their beneficiaries.

Figure VII-1. Products from FY99–02 PRMRP Awards

Military Health Research Forum

The first Military Health Research Forum held in San Juan, Puerto Rico, 25–28 April 2004, marked the fifth anniversary for the PRMRP. All PRMRP FY99–02 award recipients were invited to present (to scientists, physicians, and the military) their military health-related research findings ranging from basic science to the implementation of advanced technology. The intent of the meeting was to encourage and facilitate scientific interchange as a means to foster research progress, partnerships, and translation of research into field-usable methods and products. The forum was organized around six categories, including Combat Casualty Care Research, Infectious Disease Research, Wellness and Fitness Research, Military Operational Medicine Research, Lung Research, and Technology Research. The topics were addressed in a variety of formats, including podium presentations, poster sessions, exhibits, workshops, and product displays. The scientific research presented at the meeting was a testimony to the many talented scientists supported by the PRMRP whose research is aimed at preserving the health of our military forces. Several PRMRP-funded products and technologies have been fielded and progress is being made toward fielding many others.

Fiscal Year 2004 Joint Programmatic Review Panel Members

U.S. Navy Representatives

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Captain Doug Forcino, Ph.D., Program Director, Office of Naval Research

Captain Richard Haberberger, Ph.D., Executive Officer, Naval Medical Research Center

Commander David Street, Ed.D., M.A., Medical R&D Analyst, Chief of Naval Operations

U.S. Air Force Representatives

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Colonel James Lamiell, M.D., Chief, Clinical Investigation Regulatory Office, Army Medical Department Center and School

Colonel Bruno Petruccelli, M.D., M.P.H., Director, Epidemiology and Disease Surveillance, U.S. Army Center for Health Promotion and Preventive Medicine

U.S. Marine Corps Representative

Lieutenant Commander Sharon Moser, M.B.A., M.H.A., Project Officer and Head of the Expeditionary Medicine Branch, Marine Corps Warfighting Laboratory

Department of Health and Human Services Representative

Commander Patrick McNeilly, Ph.D., Administrative Officer, Department of Health and Human Services; Public Health Advisor, Office of Human Research Protections, Office of the Secretary, U.S. Public Health Service

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