







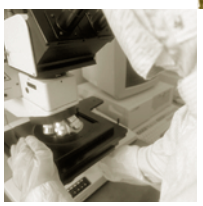

VII. Peer Reviewed Medical Research Program

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

Congressional Appropriations for Peer Reviewed Research: $94.5M in FY99–01, $50M in FY02, and $50M in FY03

Funding Summary: 67 awards from the FY99–01 appropriations; 31 awards from the FY02 appropriation; ~30 awards anticipated from the FY03 appropriation

...shaping the future of health care to prevent, control, and cure diseases.



"The Peer Reviewed Medical Research Program continues to select medical research relevant to the needs of the warfighter. As the role of our military forces escalates in the war against terrorism, the Peer Reviewed Medical Research Program strives to expedite products and technology development aimed at maintaining a healthy and fit fighting force."

Barbara Terry-Koroma, Ph.D.,
Peer Reviewed Medical Research
Program Manager

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 artillery equipment and explosives; musculoskeletal trauma experienced in times of war and during training exercises; exposure to deadly infectious diseases such as malaria, leptospirosis, and hepatitis while deployed in tropical third world countries; and acute lung injury and respiratory complications in members of the military that 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 was the formation of a Joint Programmatic Review Panel (JPRP) to determine programmatic priorities. The 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 FY03, Congress appropriated a total of $194.5M to fund peer reviewed research focused on military health through the PRMRP. A total of 98 awards have been made through FY02 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 FY02–03.

The Fiscal Year 2002 Program

The PRMRP was continued in FY02 with a $50M congressional appropriation to support peer reviewed research pertinent to the health of military forces. Congress identified 21 topic areas that could be supported by the appropriation. An additional 4 topic areas were recommended by the JPRP that had been offered in previous years that had direct military relevance. A total of 125 proposals was received, and 31 were funded. Table VII-1 provides a summary of the FY02 PRMRP topic areas in terms of proposals received, number of awards, and dollars invested.

The Business Strategy for the Fiscal Year 2003 Program

Congress appropriated $50M to continue the PRMRP in FY03. The PRMRP requested proposals in 28 topic areas: 27 recommended by Congress (Conference Committee Report No. 107-732, pp. 324–325) and 1 recommended by the JPRP that had high military relevance and was specified by Congress in previous years. A total of 298 proposals were received, as detailed in Table VII-2, and approximately 30 awards are anticipated.

Scientific Outcomes and Advances

Through FY02, 98 awards have been made from basic research through clinical applications in a wide range of topic areas. Research funded by this relatively new program is already producing tangible outcomes as depicted in Figure VII-1. Many of these products are directly impacting the lives of America's soldiers and veterans.

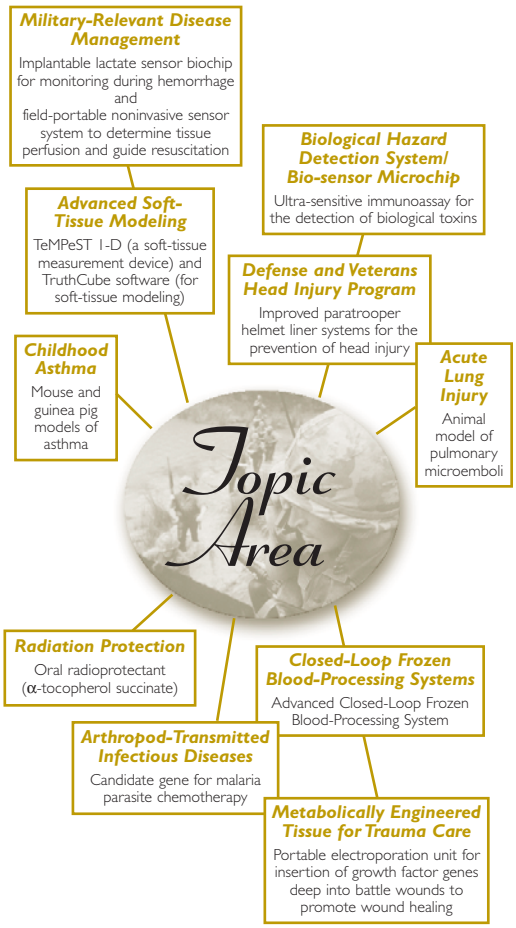


Figure VII-1. Products from FY99–02 PRMRP Awards

Table VII-1. Funding Summary for Topic Areas Offered and Proposals Received for the FY02 PRMRP

Topic Area	Number of Proposals Received	Number of Awards	Investment
Acute Lung Injury/Lung Research*	9	1	$3.3M
Chemo-Preventative Approaches to Smoking-Related Illness	3	1	$1.3M
Childhood Asthma	9	1	$0.9M
Chiropractic Care	0	0	0.0
Closed-Loop Frozen Blood-Processing Systems	1	1	$1.5M
Complex rAD-Vector Vaccine for Marburg Virus (MGBV)	2	0	0.0
Counter Narcotics Operations Medical Support Program (CONTOMS)	0	0	0.0
Dengue Fever Vaccine Research	5	1	$1.1M
High-Risk Infectious Disease	14	3	$3.7M
Laser Eye Injury*	1	1	$1.6M
Medications for Fungal and Bacterial Infections such as Fungi Free	1	0	0.0
Metabolically Engineered Tissue for Trauma Care	4	1	$0.3M
Military Nutrition Research	8	2	$2.2M
Military-Relevant Disease Management*	27	9	$14.6M
Paget's Disease	0	1	$0.8M
Preclinical and Clinical Activities of the Novonex/Ex-Rad Drugs	1	1	$1.6M
Radiation Protection	6	1	$0.9M
Real-Time Heart-Rate Variability	6	1	$0.9M
Self-Test Methods of Screening for Cervical Cancer	2	0	0.0
Sleep Management*	5	1	$0.8M
Smoking Cessation	2	1	$2.2M
Social Work Research	2	1	$1.5M
Traumatic Brain Injury	15	3	$6.4M
Vancomycin Resistant Enterococci (VRE) Research	1	0	0.0
Volume Angio Cat (VAC) Research	1	0	0.0
Total	**125**	**31**	**$45.6M**

**Topic areas recommended by the JPRP.*

Table VII-2. Topic Areas Offered and Proposals Received for the FY03 PRMRP

Topic Area	Number of Proposals Received
Acellular Matrix Research for Military Orthopedic Trauma	4
Alcoholism Research	13
Amyotrophic Lateral Sclerosis	24
Anti-diarrhea Supplement	3
Army Nutrition Research	7
Augmented Care in the Chain of Stroke Survival (ACCESS)	1
Blood-related Cancer Research	5
Bone-related Disease Research	10
Casualty Care Research Center	11
Cell Response to Anti-cancer Agents	9
Chiropractic Care	0
Epilepsy	5
Infectious Disease Tracking System	9
Interstitial Cystitis Research	14
Low Vision Research	2
Medical Digital Assistance	2
Military-Relevant Disease and Injury*	98
Miniature Renal Assistance Devices	2
Mt. Sinai Cancer Research Program	2
Natural Toxin Detection Technology	6
Neuroscience Research	43
Paget's Disease	1
Personal Intelligent Medical Assistance	0
Providence Cancer Center	1
Respiratory Research	15
Smoking Cessation	7
Social Work Research	2
Volume Angio CAT Research	2
Total	**298**

**Topic area recommended by the JPRP.*

Additional research accomplishments are summarized below by topic area, including alcohol abuse prevention research, advanced soft-tissue modeling, laser eye injury, and acute lung injury research.

Alcohol Abuse Prevention Research

Alcohol abuse prevention is a topic area of interest due to the impact it can have on the readiness of military personnel. Understanding the mechanisms underlying alcohol abuse can lead to effective therapeutic interventions. Dr. Caldwell and colleagues at the University of New Mexico Health Sciences Center are elucidating the molecular basis of fetal alcohol exposure-induced learning and memory deficits in a rat model of fetal alcohol exposure. They found that adult rats exposed to alcohol prenatally displayed a decrement in learned fear. This deficit was associated with altered brain signaling mechanisms.

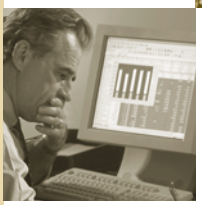
Advanced Soft-Tissue Modeling

Accurate soft-tissue models are essential to the development of medical simulation systems used for the training and planning of minimally invasive surgery. Improved soft-tissue modeling is important for the development of surgical simulations with realistic force feedbacks. A collaborative team headed by Dr. Vesely, with members from the Cleveland Clinic Foundation and NASA Glenn, is developing a soft-tissue model for surgical simulation and telemedicine. In this case, researchers are working to develop a high-fidelity computational model for biological materials. Significant progress has been reported toward establishing a sound theoretical basis for the different computational approaches toward the modeling of soft biological tissues.

Laser Eye Injury

Conflict in the 21st century involves advanced weapons such as lasers that have the potential for serious, irreversible eye injuries. Until now, research has focused mainly on damage to the retina. But it is the cornea, the most exposed part of the eye, which is most susceptible to battlefield lasers. These instruments operate in the infrared region of the spectrum and can seriously damage the cornea. With no currently available treatment, this

type of injury is irreversible. The PRMRP has funded Dr. Russell McCally of the Johns Hopkins University Applied Physics Laboratory, and Dr. Thomas Johnson through the Henry M. Jackson Foundation at the Uniformed Services University of the Health Sciences, who are conducting studies on the effects of laser energy on corneal tissue. Changes in corneal proteins will allow researchers to identify new therapies, which may lead to new treatments for battlefield management of corneal laser eye injuries.



Acute Lung Injury Research

Members of the military forces are often exposed to conditions that can lead to acute lung injury (e.g., toxic gas and smoke inhalation). Acute lung injury is characterized by the activation of tissue remodeling, which can lead to irreversible consequences. Dr. Roman leads researchers funded through the Atlanta Research and Education Foundation at the Atlanta VA Medical Center and Emory University exploring the factors involved in controlling tissue remodeling in acute lung injury. Their preliminary data show that chronic alcohol ingestion renders the lung susceptible to acute lung injury by acting on $\alpha 7$ nicotinic acetylcholine receptors and by stimulating the expression of tissue remodeling genes such as fibronectin.

Summary

Since 1999, the PRMRP has been responsible for managing $194.5M in congressional appropriations, resulting in 98 awards for FY99–02. The products of these efforts are directly impacting the lives of America's soldiers and veterans, and ultimately affecting our military readiness.

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