



SECTION VII PEER REVIEWED MEDICAL RESEARCH PROGRAM

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

Congressional Appropriations for Peer-Reviewed Research: \$44.5M in FY99-00; \$50M in FY01; and \$50M in FY02

Funding Summary: 30 awards from the FY99-00 appropriations; 37 awards from the FY01 appropriation; ~30 awards anticipated from the FY02 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. Such 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 continues to be an area of high military relevance; 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) PRMRP¹ 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, Department of Defense (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. This panel is usually chaired by the Reliance Panel Chair for Biomedical Science and Technology.

From FY99–02, Congress appropriated a total of \$144.5M to fund peer-reviewed research focused on military health through the PRMRP. A total of 67 awards have been made through FY01 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 FY01–02. Additional details of the FY99–00 program may

¹ In FY99, the first year of the PRMRP, this program was called the Defense Health Research Program.

be found in the DOD CDMRP Annual Reports of September 2000 and September 2001.

FY01 PROGRAM

The PRMRP was continued in FY01 with a \$50M congressional appropriation to support peer-reviewed research pertinent to the health of military forces. Congress identified 27 areas that could be supported by the appropriation. In addition, 4 topic areas of high military relevance, previously recommended by Congress and offered in other fiscal years were included. Table VII-1 provides a summary of the FY01 PRMRP topic areas in terms of proposals received, number of awards, and dollars invested.

THE BUSINESS STRATEGY FOR THE FY02 PROGRAM

Congress appropriated \$50M to continue the PRMRP in FY02. Congress recommended that the DOD request proposals in 21 topic areas (Conference Committee Report No. 107-350, p. 394). 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 were received, as detailed in Table VII-2. Scientific peer review was conducted in July 2002, and programmatic review was conducted in August 2002. Approximately 30 awards are anticipated.

Table VII-1. Funding Summary for the FY01 PRMRP

Topic Area	Number of Proposals Received	Number of Awards	Investment
<i>Acute Lung Injury Research</i>	24	6	\$4.4M
<i>Alcohol Abuse Prevention Research*</i>	4	1	\$1.0M
<i>Arthropod Transmitted Infectious Diseases</i>	16	4	\$4.4M
<i>Biological Hazard Detection System/Biosensor</i>	4	1	\$0.4M
<i>CAT Scan Technology for Lung Cancer</i>	2		–
<i>Childhood Asthma</i>	6	3	\$3.2M
<i>Dengue Fever Vaccine Research</i>	1		–
<i>Digital Mammography Imaging</i>	1	1	\$1.7M
<i>Freeze-Dried Platelets</i>	3		–
<i>Fungi Free</i>	3	1	\$0.3M
<i>Gulf War Illnesses</i>	19	3	\$2.8M
<i>Health Care Informatics</i>	4		–
<i>Health System Information Technology</i>	4		–
<i>Human Imaging Institute/Magnetoence Phalography Laboratory</i>	0		–
<i>Laser Eye Injury*</i>	3	2	\$1.3M
<i>Medical Records Management</i>	1		–
<i>Medical Surgery Technology</i>	4	1	\$1.2M
<i>Microsurgery and Robotic Surgery Research</i>	1		–
<i>Military Relevant Disease Management*</i>	29	6	\$5.2M
<i>Molecular Biology for Cancer Research</i>	19	3	\$2.5M
<i>Neural Mechanisms for Chronic Fatigue Syndrome</i>	1		–
<i>Obesity-Related Disease Prevention Especially for Minorities</i>	4	1	\$1.0M
<i>Padgett's Disease</i>	1		–
<i>Quantum Optics</i>	0		–
<i>Remote Emergency Medicine Ultrasound</i>	4	1	\$2.0M
<i>Sleep Management*</i>	4	1	\$1.7M
<i>Smoking Cessation</i>	3	2	\$2.4M
<i>Social Work Research</i>	2		–
<i>Tissue Regeneration for Combat Casualty Care</i>	8		–
<i>Venous 3D Technology Program</i>	1		–
<i>Vitamin D Research</i>	4		–
Total	180	37	\$35.5M

* Topic areas recommended by the JPRP.

SCIENTIFIC OUTCOMES AND ADVANCES

Research funded by this relatively new program is already producing results. Through FY01, 67 awards have been made from basic research through clinical applications. Summarized below are some of the exciting advances being made in sleep management, alcohol abuse, and childhood asthma.

Sleep Management.

Douglas Eddy, Ph.D., NTI, Inc., Steven Hursh, Ph.D., SAIC, and Jonathan French, Ph.D., MAAD: Fatigue is a very important issue in the military population. The ability to manage fatigue is critical to the success of extended operational requirements. PRMRP researchers at NTI, Inc. are developing a fatigue management tool aimed at optimizing human cognitive capability and sustaining warfighter performance.

Data gathered from this study is being used to enhance the Fatigue Avoidance Scheduling Tool (FAST). FAST is a computerized decision aid designed to assist operational planners in scheduling work and rest to avoid or minimize the effects of fatigue on human performance. The researchers have enhanced FAST by adding a transmeridian relocation feature that predicts the adaptation of performance to changes in time zones that might accompany transmeridian flights or that might occur if the subject shifts to a regular schedule of night time flying. The researchers are also assessing the use of a pharmacological countermeasure, flumazenil, to facilitate awakening after taking a sleep aid. To date, they have determined that a sublingual method of administering flumazenil would be most advantageous for military purposes. The researchers have recently completed the design of a combination study in which they will compare two stimulants and two sleep-promoting compounds for facilitating performance during repeated 36-hour missions separated by only 12 hours of crew rest.

Alcohol Abuse Prevention Research.

Csaba Vadasz, Ph.D., Mariko Saito, Ph.D., and Balopal Basavarajappa, Ph.D., The Research Foundation for Mental Hygiene: Alcohol abuse has been reported at higher rates for active duty military personnel than for civilians. The identification of a genetic risk factor for alcoholism could lead to the improvement of current military screening procedures as well as the development of new

Table VII-2. Topic Areas Offered and Proposals Received for the FY02 PRMRP

Topic Area	Number of Proposals Received
Acute Lung Injury Research*	9
Complex rAD-Vector Vaccine for MGBV (Marburg Virus)	2
Chemo-preventative Approaches to Smoking Related Illness	3
Childhood Asthma	9
Chiropractic Care	—
Closed Loop Frozen Blood Processing Systems	1
Counter Narcotics Tactical Operations Medical Support Program (CONTOMS)	—
Dengue Fever Vaccine	5
High Risk Infectious Disease	14
Laser Eye Injury*	1
Medications for Fungal and Bacterial Infections such as Fungi Free	1
Metabolically Engineered Tissue for Trauma Care	4
Military Nutrition Research	8
Military Relevant Disease Management*	27
Padgett's Disease	—
Pre-Clinical & Clinical Activities of the Novonex/Ex-Rad drugs	1
Radiation Protection	6
Real-time Heart Rate Variability	6
Self-Test Methods of Screening for Cervical Cancer	2
Sleep Management*	5
Smoking Cessation	2
Social Work Research	2
Traumatic Brain Injury	15
Volume Angio Cat (VAC) Research	1
Vancomycin-Resistant Enterococci (VRE) Research	1
Total	125

* Topic areas recommended by the JPRP.

drugs and treatment modalities. PRMRP researchers at The Research Foundation for Mental Hygiene, Incorporated are elucidating the genetic factors and their interactions that contribute to the expression of alcoholism. Specifically, they are studying how the opioid receptor kappa 1 (*Oprk1*) gene affects excessive alcohol drinking in an animal model system. They identified a genetic marker associated with alcohol preference in a region of chromosome 1 containing the *Oprk1* gene. The researchers found small but significant differences in the ratio of two variants of *Oprk1* messenger RNA, variant A and variant B, between an alcohol-preferring mouse strain and an alcohol-avoiding mouse strain. In a preliminary set of experiments, they found that mice lacking *Oprk1* showed a lower preference for alcohol than mice with *Oprk1*. Overall, these promising results indicate that *Oprk1* plays a role in excessive alcohol drinking.

Childhood Asthma.

Charles Callaban, D.O., COL, MC, USA, and Debora Chan, Pharm D., Tripler Army Medical Center: Asthma is the leading cause of chronic disease of childhood and has

"It is a distinct honor and privilege to have the opportunity to support enhanced military readiness at this critical time in our country's history. This program strives to support Soldiers, Sailors, Air Men, Marines, and their families by identifying solutions to critical military relevant health care problems."

*—Barbara Terry-Koroma, Ph.D.
PRMRP Manager*



a marked impact on military families. Management of childhood asthma requires effective medical therapy, adherence to the medical therapy, and patient education and monitoring. Researchers at the Tripler Army Medical Center have designed an internet-based, in-home asthma-monitoring system. The goal of this project, known as the Telemedicine In-Home Monitoring Evaluation pilot (TIME-P) study, is to determine whether "virtual" asthma education is equivalent to or better than asthma education given face-to-face. The researchers have established a web site for the study, which is located at http://www.tamc.amedd.army.mil/time_p/time_p_home_frame.htm. Ten pediatric asthma patients have participated in the TIME pilot study. The researchers found that adherence to submission of daily asthma diary and videos decreased over time. However, they observed that the provision of home telehealth case management to children with persistent asthma resulted in improved therapeutic and disease control outcomes as measured by inhaler technique and percent of personal best peak flow values over a 6-month period. A controlled trial of this technology, the Asthma In-Home



Monitoring Project, is now under way that follows 60 children with a web-based case management and education system and 60 children receiving care in an ideal office setting. Ultimately, this technology could allow military families of children afflicted by asthma to be deployed at a distance from medical care for asthma but still benefit from the close care of asthma experts.

SUMMARY

Since 1999, the PRMRP has been responsible for managing \$144.5M in congressional appropriations, resulting in 67 awards for FY99–01. The products of these efforts will directly impact the lives of America's soldiers and veterans and ultimately affect military readiness and thus benefit all Americans.

JOINT PROGRAMMATIC REVIEW PANEL MEMBERS



U.S. Navy Representatives

**Chair, Admiral,
Steven E. Hart:**
Assistant Chief for

Operational Medicine and Fleet Support, Bureau of Medicine and Surgery, Washington, DC. Board-certified in Family Practice and Aerospace Medicine/Preventive Medicine. Certified as Healthcare Executive, American College of Healthcare Executives. Member, American Medical Association, American Osteopathic Association, Association of Military Surgeons of the United States, and Society of U.S. Naval Flight Surgeons.

Alternate Chair, Captain Edward Lane: Director of the Navy Medical Research and Development Division. Chief, Bureau of Medicine and Surgery in Washington, DC. Research interests include bacterial, mycotic, viral, parasitic, and entomological diseases.

Captain James R. Campbell: Medical Research and Development Liaison, Office of Chief of Naval Operations and Bureau of Medicine, Washington, DC. Adjunct Professor of Microbiology, University of Maryland, Adjunct Professor of International Health, George Washington University School of Public Health, and Clinical Professor of Public Health Sciences, University of Hawaii School of Medicine. Research interests include

bacterial, viral, parasitic, and entomological diseases.

Commander Douglas Forcino: Medical Research and Development Liaison Officer for the Chief of Naval Operations (N931) in Crystal City, Virginia. Research interests in cerebral and coronary blood flow regulation, hemodynamics, central nervous system oxygen toxicity, and effects of hyperbaria on cardiovascular function.

Lieutenant Commander Randal LeBlanc: Director for the Navy Medical Research Laboratories and Deputy Director for the Navy Medical Research and Development Division, Bureau of Medicine and Surgery, Washington, DC. Member, American Academy of Medical Administrators. Member, American Academy of Contingency Planners.



U.S. Marine Corps Representative

**Lieutenant
Commander**

Joseph A. DaCorta: Head, Expeditionary Medicine, Marine Corps Warfighting Laboratory, Quantico, Virginia. Diplomate, American College of Healthcare Executives. Member, Association of Military Surgeons of the United States.



U.S. Army Representatives

**Colonel Kent
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Director of Hepatology Service and Staff Gastroenterologist at Walter Reed Army Medical Center in Washington, DC. Board-certified in Internal Medicine with a specialty in Gastroenterology. Board-certified, National Board of Medical Examiners. Research interests include epidemiology and treatment of viral hepatitis, hepatocellular carcinoma, and steatohepatitis.

Colonel James Lamiell: Attending physician at Brooke Army Medical Center, Texas. Chief of the Clinical Investigation Regulatory Department, Army Medical Department Center and School (Texas). Clinical Investigation Consultant to the Surgeon General of the U.S. Army. Ad hoc consultant to Association for Assessment and Accreditation of Laboratory Animal Care International. Chairman of the Army Medical Department Journal Editorial Board. Board-certified in Internal Medicine and Critical Care Medicine.

Lieutenant Colonel Bruno Petrucci: Epidemiology Program Manager, U.S. Army Center for Health Promotion and Preventive Medicine at Aberdeen Proving Ground, Maryland. Fellow, American College of Preventive Medicine. Diplomate, National Board of Medical Examiners. Board-certified in General Preventive Medicine and Public Health.



**U.S. Air Force
Representatives**

**Major Mark
Nunes:** Director of
the DNA Diagnostic

Laboratory, Laboratory Director for Breast Cancer Education and Awareness Project, Staff Clinical Geneticist and Staff Attending Pediatrician at Keesler Air Force Base, Mississippi. Fellow, American Academy of Pediatrics.

**Lieutenant Colonel (SEL) Paul
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**Lieutenant Colonel Alfred
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**Office of the
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**Salvatore Cirone, D.V.M.,
M.P.V.M.:** Program Director for Health Sciences Policy, Department of Health Affairs in Falls Church, Virginia. Diplomate, American College of Veterinary Preventive Medicine.

**Lieutenant Colonel Roger L.
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**Department of
Health and
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**Commander
Patrick McNeilly:**

Executive Assistant to the Principal Deputy Assistant Secretary for Health, Office of Public Health and Science, Office of the Secretary in Washington, DC. Alternate, Surgeon General's Policy Advisory Committee.



**Department of
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**Brenda
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Program Specialist at the Veterans Health Administration, Department of Veterans Affairs in Washington, DC. Member, Human Subjects Research Subcommittee of the Committee on Science for the National Science and Technology Council. Research interests include common variable immunodeficiency, Lyme disease, and chronic fatigue syndrome.