THE ASSISTANT SECRETARY OF DEFENSE

1200 DEFENSE PENTAGON
WASHINGTON, DC 20301-1200

HEALTH AFFAIRS

MAY 5 2006

The Honorable John W. Warner
Chairman, Committee on Armed Services
United States Senate
Washington, DC 20510-6050

Dear Mr. Chairman:

This letter forwards a response to the request of Department of Defense Appropriations for Fiscal Year 2006 Conference Report 109-359 for the Secretary of Defense to provide a report on the status of the Peer Reviewed Medical Research Program.

The Peer Reviewed Medical Research Program (PRMRP) was created by Congress in Fiscal Year (FY) 1999 to provide support for military health-related research of clear scientific merit. The US Army Medical Research and Materiel Command (USAMRMC) is the Executive Agent for the PRMRP. The PRMRP is managed by the USAMRMC Office of the Congressionally Directed Medical Research Programs (CDMRP). The FY99—FY05 PRMRP congressional appropriation totaled $294.5 million (M), which supported a diverse portfolio consisting of 198 projects. The program was continued through FY06, with total appropriations to date of $344.5 million (FY99—FY06). Proposals are solicited via a supplement to the USAMRMC Broad Agency Announcement, and undergo scientific (peer) and programmatic (military relevance, cost/benefit, and program balance) reviews. Proposals that address the unique focus and goals of the PRMRP most effectively are recommended for funding to the Commanding General (CG), USAMRMC, by a Joint Programmatic Review Panel (JPRP). Following approval by the CG, USAMRMC, the US Army Medical Research Acquisition Activity negotiates awards.

In FY06, $50M was appropriated to the PRMRP. A total of 21 topic areas were recommended by Congress. They included the following research areas: advanced proteomics; alcoholism; autism; blood-related cancer such as leukemia, lymphoma, and multiple myeloma; childhood asthma; childhood cancer; chronic pain and fatigue; diabetes; Duchenne's disease; eye and vision; fibromyalgia; interstitial cystitis syndrome; kidney cancer; lupus; osteoporosis and bone-related diseases; polycystic kidney disease; pulmonary hypertension; Padget's disease; post-traumatic stress disorders; social work; and autoimmune diseases such as scleroderma and Sjogren's syndrome. The Office of the Assistant Secretary of Defense for Health Affairs (ASD[HA]) added the topic areas of military relevant disease management with special emphasis on antibiotic resistance;

neurotoxicity of mefloquine; rehabilitation (face and eye injury); respiratory infection, including associated respiratory disease; drug abuse; efficacy and subsequent clinical guidelines for the use of probenecid or other drugs to decrease dosage requirements of oseltamivir phosphate for the treatment of influenza; human performance optimization; radioprotectants; and mental health resiliency. Proposal solicitation is under way, with a proposal receipt deadline of May 9. A two-tiered scientific and programmatic proposal review process will occur in July and September, respectively.

This final report provides information on the entire program from FY99 through FY05.

Appendix II of the report covers the Department of Defense HIV/AIDS Prevention Program. Management of that Program was transferred to the Navy as Executive Agent in 2000, and the N avy Program Director prepared that portion of the report.

Thank you for your continued support of the Military Health System.

Sincerely,

William Winkenwerder, Jr., MD

Enclosure:
As stated

cc:
Senator Carl Levin

Report on:

Peer Reviewed Medical Research Program

March 2006

In Response to:

Department of Defense Appropriations
for Fiscal Year 2006 Conference Report 109-359
Report on Peer Reviewed Medical Research Program

REPORT TO THE US CONGRESS

PEER REVIEWED MEDICAL RESEARCH PROGRAM

March 1, 2006

Peer Reviewed Medical Research Program

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PURPOSE OF REPORT

This report provides the status of the US Army Medical Research and Materiel Command (USAMRMC) Peer Reviewed Medical Research Program (PRMRP), formerly called the Defense Health Research Program (fiscal years 1999-2000 [FY99-FY00]). The PRMRP was established by Congress in FY99 to fund medical research projects that have direct relevance to military health. This report provides the PRMRP status through FY06.

EXECUTIVE SUMMARY

INTRODUCTION

The Peer Reviewed Medical Research Program (PRMRP), which was originally titled Defense Health Research Program (fiscal years 1999-2000 [FY99-FY00]), was created by Congress in FY99 to provide support for military health-related research of clear scientific merit. The US Army Medical Research and Materiel Command (USAMRMC) is the Executive Agent for the PRMRP. The PRMRP is managed by the USAMRMC Office of the Congressionally Directed Medical Research Programs (CDMRP). The FY99-FY05 PRMRP congressional appropriation totaled $294.5 million (M), which supported a diverse portfolio consisting of 198 projects. The program was continued through FY06 with total appropriations to date of $344.5 M (FY99-FY06). Proposals are solicited via a supplement to the USAMRMC Broad Agency Announcement and undergo scientific (peer) and programmatic reviews. Proposals that address the unique focus and goals of the PRMRP most effectively are recommended for funding to the Commanding General (CG), USAMRMC by a Joint Programmatic Review Panel (JPRP). Following approval by the CG, USAMRMC, the US Army Medical Research Acquisition Activity negotiates awards.

FY06

In FY06, $50M was appropriated to the PRMRP. A total of 21 topic areas were recommended by Congress: Advanced Proteomics; Alcoholism Research; Autism; Blood-Related Cancer Research such as Leukemia, Lymphoma, and Multiple Myeloma; Childhood Asthma; Childhood Cancer Research; Chronic Pain and Fatigue Research; Diabetes Research; Duchenne's Disease Research; Eye and Vision Research; Fibromyalgia; Interstitial Cystitis Syndrome; Kidney Cancer Research; Lupus Research; Osteoporosis and Bone-Related Diseases; Polycystic Kidney Disease; Pulmonary Hypertension; Padget's Disease; Post-Traumatic Stress Disorders; Social Work Research; and Autoimmune Diseases such as Scleroderma and Sjogren's Syndrome. The Office of the Assistant Secretary of Defense for Health Affairs (ASD[HA]) added the topic area Military Relevant Disease Management with special emphasis on antibiotic resistance; neurotoxicity of mefloquine; rehabilitation (face and/or eye injury); respiratory infection including associated respiratory disease; drug abuse; efficacy and subsequent clinical guidelines for the use of probenecid or other drugs to decrease dosage requirements of oseltamivir phosphate for the treatment of influenza; human performance optimization; radioprotectants; and mental health resiliency. Proposal solicitation is under way, with a proposal receipt deadline of May 9, 2006. A two-tiered scientific and programmatic proposal review process will occur in July and September 2006, respectively.

FY05

In FY05 $50M was appropriated to the PRMRP. The USAMRMC received funds for the PRMRP in October 2004. Proposals were solicited in the following 21 topic areas recommend by Congress: Acellular Human Tissue Matrix Research, Amyotrophic Lateral Sclerosis, Alcoholism Research, Anti-radiation Drug Development, Autism, Autoimmune Diseases such as Scleroderma and Sjogren's Syndrome, Blood-Related Cancer Research, Childhood Asthma, Chronic Pain Research, Conjugate Vaccines to Prevent Shigellosis, Diabetes Research, Duchenne's Disease Research,

Epilepsy Research, Interstitial Cystitis, Lupus and Lupus-Biomarker Research, Orthopaedic Extremity Trauma Research, Osteoporosis and Bone Related Diseases Research, Paget's Disease, Post-Traumatic Stress Disorder, Social Work Research, and Volume Angio CAT (VAC) Research. Two additional topic areas, Lung Cancer Screening and Military Relevant Disease Management especially *Acinetobacter baumannii* Infections, Obesity Research, and Smoking Cessation, were added by the Office of the ASD(HA). Proposals were received in March 2005 and underwent peer and programmatic reviews in May and July 2005, respectively. A total of 40 proposals were approved for funding by the CG, USAMRMC. The majority of the grants have been awarded, and the remainder will be awarded by March 2006.

FY99-FY04

The total FY99-FY04 PRMRP congressional appropriation was $244.5M. Proposals were solicited in 15, 18, 31, 25, 28, and 23 topic areas, respectively. Following scientific peer review and programmatic review, 158 proposals were approved for funding by the CG, USAMRMC. A portion of FY99 and FY01 PRMRP funds was assigned by the Office of the ASD(HA) for management outside the CDMRP. In FY99, $4M was assigned to the Brooke Army Medical Center to support a Chronic Disease Management Project focusing on congestive heart failure. Management responsibility for the project was assigned to the USAMRMC Office of Telemedicine and Advanced Technology Research Center (TATRC). In FY01, $10M was assigned to the Naval Health Research Center to support the Department of Defense (DOD) portion of the Leadership and Investment in Fighting an Epidemic (LIFE) Initiative. Within the LIFE Initiative, the DOD assists African militaries (and other uniformed organizations) with their HIV/AIDS Prevention Programs (DHAPP). Management responsibility for the DHAPP project was assigned to the Navy Bureau of Medicine and Surgery (BUMED), and implemented at the Naval Health Research Center in San Diego.

PROGRESS and ACCOMPLISHMENTS

A number of the FY99-FY04 funded projects, those managed by the CDMRP and those managed by TATRC and BUMED, have already produced interesting research outcomes relevant to military health issues. These projects range from basic research to technology development and cover more than 100 topic areas including: Acute Lung Injury, Childhood Asthma, Smoking Cessation, Alcohol Abuse Prevention, Military Relevant Disease Management, and Chronic Disease Management. Examples of research outcomes include a systematic method of delivering antioxidants and clot-dissolving enzymes into the lung to prevent inflammation; creation of a video-based tobacco cessation intervention aimed at decreasing tobacco use in the military; development of a closed-loop frozen blood processing model unit (the manufactured unit will provide the Armed Forces a more practical choice between fresh packed red blood cells and a frozen red cell alternative); development of an improved dengue fever vaccine; design of an Internet-based, in-home asthma monitoring system for children; development of an improved method for improved healing of war wounds; a prototype miniature surgical robot; development of a food-based antidiarrheal supplement; creation of a field-deployable assay system for detecting biological toxins; and development of a self-operated, portable, low irradiance treatment device for pseudofolliculitis barbae, a significant dermatologic disease in the US Army.

SUMMARY

The PRMRP continues to fulfill congressional intent by funding research of clear scientific merit with direct relevance to the health of the warfighter and the military family, and the American public. The FY99-FY05 PRMRP congressional appropriation, which totaled $294.5M, has provided funding for 198 projects in more than 60 topic areas. Many projects funded by the PRMRP have begun to yield combat health support technologies and products in the areas of Combat Casualty Care, Military Infectious Diseases, Military Operational Medicine, Chronic Disease Management, and Medical Chemical and Biological Defense, thus complementing the current USAMRMC Core priorities. The FY06 PRMRP is underway and is expected to continue attracting exciting research and technology development.

FISCAL YEAR 1999-2006 PEER REVIEWED MEDICAL RESEARCH PROGRAM

I. INTRODUCTION

The Peer Reviewed Medical Research Program (PRMRP) was created by Congress in fiscal year 1999 (FY99) to provide support for military health-related research of clear scientific merit. The program was continued through FY06 with total appropriations of $344.5 million (M) (FY99-FY06) via Defense Health Programs; Research, Development, Test and Evaluation (DHP, RDT&E). The US Army Medical Research and Materiel Command (USAMRMC) was selected by the Office of the Assistant Secretary of Defense for Health Affairs [(ASD(HA)] as Executive Agent for this program through Joint Services coordination and the specific recommendation of the Armed Services Biomedical Research Evaluation and Management Committee. The PRMRP is managed through the USAMRMC Office of the Congressionally Directed Medical Research Programs (CDMRP). The administrative process includes establishing a yearly execution strategy and programmatic priorities that include scientific merit and military relevance. The management strategy is established by an interagency Joint Programmatic Review Panel (JPRP), which consists of representatives from the Army, Air Force, Navy, Marine Corps, Office of the ASD(HA), and Departments of Veterans Affairs and Health and Human Services. Proposals for each year's program are solicited via a supplement to the USAMRMC Broad Agency Announcement. Following receipt, proposals undergo scientific merit review (peer review), conducted by external scientific and clinical experts, and programmatic review conducted by the JPRP. The JPRP, through defined programmatic priorities, recommends proposals that most effectively address the unique focus and goals of the PRMRP for funding to the Commanding General (CG), USAMRMC (who holds final approval authority). Following approval by the CG, USAMRMC, awards are negotiated by the US Army Medical Research Acquisition Activity.

II. PROGRAM OVERVIEW

FY06

In FY06, $50M was appropriated to the PRMRP. Proposals will be solicited in the 21 topic areas recommended by Congress: Advanced Proteomics; Alcoholism Research; Autism; Blood-Related Cancer Research such as Leukemia, Lymphoma, and Multiple Myeloma; Childhood Asthma; Childhood Cancer Research; Chronic Pain and Fatigue Research; Diabetes Research; Duchenne's Disease Research; Eye and Vision Research; Fibromyalgia; Interstitial Cystitis Syndrome; Kidney Cancer Research; Lupus Research; Osteoporosis and Bone-Related Diseases; Polycystic Kidney Disease; Pulmonary Hypertension; Padget's Disease; Post-Traumatic Stress Disorders; Social Work Research; and Autoimmune Diseases such as Scleroderma and Sjogren's Syndrome. An additional topic area, Military Relevant Disease Management with special emphasis on antibiotic resistance; neurotoxicity of mefloquine; rehabilitation (face and/or eye injury); respiratory infection including associated respiratory disease; drug abuse; efficacy and subsequent clinical guidelines for the use of probenecid or other drugs to decrease dosage requirements of oseltamivir phosphate for the treatment of influenza; human performance optimization; radio-protectants; and mental health

resiliency, was added by the Office of the ASD(HA). Proposal solicitation is underway, with a proposal receipt deadline of May 9, 2006. Peer review by an external panel of scientists will be held in July 2006. Programmatic review will be conducted by the JPRP in September 2006. Award negotiations will begin in October 2006. All awards will be managed for scientific progress and regulatory and budgetary requirements.

FY05

In FY05 $50M was appropriated to the PRMRP. The USAMRMC received funds for the PRMRP in October 2004. Proposals were solicited in the following 21 topic areas recommend by Congress: Acellular Human Tissue Matrix Research, Amyotrophic Lateral Sclerosis, Alcoholism Research, Anti-radiation Drug Development, Autism, Autoimmune Diseases such as Scleroderma and Sjogren's Syndrome, Blood-Related Cancer Research, Childhood Asthma, Chronic Pain Research, Conjugate Vaccines to Prevent Shigellosis, Diabetes Research, Duchenne's Disease Research, Epilepsy Research, Interstitial Cystitis, Lupus and Lupus-Biomarker Research, Orthopaedic Extremity Trauma Research, Osteoporosis and Bone Related Diseases Research, Paget's Disease, Post-Traumatic Stress Disorder, Social Work Research, and Volume Angio CAT (VAC) Research. Two additional topic areas were added by the Office of the Assistant Secretary of Defense for Health Affairs [(ASD(HA)] including, Lung Cancer Screening and Military Relevant Disease Management especially *Acinetobacter baumannii* Infections, Obesity Research, and Smoking Cessation. Proposals were received in March 2005 and underwent peer and programmatic reviews in May and July 2005, respectively. A total of 40 proposals were approved for funding by the CG, USAMRMC. The majority of the grants have been awarded, and the remainder will be awarded by March 2006. Detailed funding information (including congressional appropriation and associated withholds, as well as proposals received and funded by topic area and institution) is provided in Tables I and II.

Table I: FY05 PRMRP Funding Outcomes by Topic Area

Topic Area	# Proposals Received	# Recommended for Funding	Organization	Proposal Title
Acellular Human Tissue Matrix Research	6	1	LifeCell Corporation	Acellular Human Tissue Matrix Research: Matrix-Mediated Regeneration of Orthopedic Tissues for Military Applications
Alcoholism Research	23	2	Louisiana State University Health Science Center	Alcohol Intoxication Impact on Outcome from Traumatic Injury
			University of North Carolina, Chapel Hill	The Role of Neuropeptide Y (NPY) in Uncontrolled Alcohol Drinking and Relapse Behavior Resulting from Exposure to Stressful Events
Amyotrophic Lateral Sclerosis	28	2	Duke University	Do Tau Mutations Increase Susceptibility to Amyotrophic Lateral Sclerosis?
			University of Cincinnati	Biomarkers for Amyotrophic Lateral Sclerosis in Active Duty Military-BALSAM

Topic Area	# Proposals Received	# Recommended for Funding	Organization	Proposal Title
Anti-Radiation Drug Development	15	2	Burnham Institute	Anti-Apoptotic Drugs for Radioprotection
			Henry M. Jackson Foundation	Mechanisms of 5-Androstenediol Radioprotection: Human Hematopoietic Niche
Autism	35	0		
Autoimmune Diseases such as Scleroderma and Sjogren's Syndrome	29	1	Northwestern University	Role and Mechanism of Action of Egr-1 in the Pathogenesis of Scleroderma
Blood-Related Cancer Research	29	1	Brown University	Molecular Mechanisms of Cell Survival by TLR Ligands
			University of Southern California	Immune Response Genotypes and Risk of Young Adult Hodgkin Lymphoma
Childhood Asthma	5	1	Harvard University	Scavenger Receptors and Resistance to Inhaled Allergens
Chronic Pain Research	19	1	University of Florida	Prevention of Low Back Pain in the Military: A Randomized Clinical Trial
Conjugate Vaccines to Prevent Shigellosis	2	1	EndoBiologics, Inc.	Conjugate Vaccines to Prevent Shigellosis
Diabetes Research	34	1	Johns Hopkins University	Maintenance of Glucose Homeostasis through Acetylation of the Metabolic Transcriptional Coactivator PGC-1-alpha
Duchenne's Disease Research	2	0		
Epilepsy Research	8	0		
Interstitial Cystitis Research	6	1	University of Iowa	BCG Binding Protein, FAP as an Immunoregulator in the Treatment of Interstitial Cystitis
Lung Cancer Screening*	4	1	H.Lee Moffitt Cancer Center & Research Institute	Integration of Anatomic and Pathogenetic Bases for Early Lung Cancer Diagnosis
Lupus and Lupus-Biomarker Research	29	2	University of Minnesota	Validation of Biomarkers in Systemic Lupus
			Henry M Jackson Foundation	T Cell Lipid Rafts and Complement Ligands for Diagnosis and Monitoring of SLE

* Topic Area added by ASD(HA)

Topic Area	# Proposals Received	# Recommended for Funding	Organization	Proposal Title
Military Relevant Disease Management (especially research on *Acinetobacter baumannii* infections, obesity research, and smoking cessation)*	72	9	Temple University	Effect of Morphine and Trauma on *Acenitobacter baumannii* Infection in a Murine Model
			University of Pittsburgh	Novel Nitroxide Resuscitation Strategies in Experimental Traumatic Brain Injury
			Social Sectors Development Strategies, Inc.	Risk Factors for Discharge from the Army with a Permanent Disability
			Columbia University College of Physicians and Surgeons	Molecular Mechanisms and Treatment Strategies for Obesity-Associated Coronary Artery Disease, an Imminent Military Epidemic
			University of Texas Health Science Center at San Antonio	Molecular Identification of Human Fungal Pathogens
			University of Cincinnati	Molecular Connections between Arousal and Metabolic Disease: Orexin and Modafinil
			T.R.U.E. Research Foundation	Lead Optimization and Pre-Clinical Studies of Imidazolidinedione Derivatives as Malaria Prophylactic
			University of Miami School of Medicine	The Use of Lentiviral-Vector-Mediated Transduction of Neural Progenitor Cells to Repair the Brain after Traumatic Brain Injury
			Henry M. Jackson Foundation	Carcinogenicity of Embedded Tungsten Alloys in Mice
Orthopaedic Extremity Trauma Research	45	5	University of Rochester	Impact of Nicotine on Fracture Repair: Mechanism of Action
			University of Michigan	The Influence of Physical Forces on Progenitor Cell Migration, Proliferation, and Differentiation in Fracture Repair
			Western Institute for Biomedical Research	Development of Osseointegrated Implants for Soldier Amputees Following Orthopaedic Extremity Trauma
			University of California, Santa Barbara	The Role of the Pseudopterosins and Their Analogs in Wound Healing
			Johns Hopkins University	Self Managing the Consequences of Major Limb Trauma

Topic Area	# Proposals Received	# Recommended for Funding	Organization	Proposal Title
Osteoporosis and Bone-Related Disease Research	60	4	University of Notre Dame	Contrast Agents for Micro-Computed Tomography of Microdamage in Bone
			Geneva Foundation	Bisphosphonate-Ciprofloxacin Carried by or Tethered to Micron or Nanosized Hydroxyapatite Particles as a Prototype for Local Antibiotic Delivery to Injured Bone
			Texas A&M University System Health Sciences Center Research Foundation	Impact of Graded Energy Restriction on Bone Health in Exercising Female Rats: Endocrine Mechanisms
			University of Toronto	Increased Caloric Intake to Reverse Energy Deficiency in Exercising Women: Impact on Bone and Menstrual Cyclicity
Paget's Disease	2	0		
Post-Traumatic Stress Disorder	33	3	Bronx Veterans Medical Research Foundation, Inc.	Neuroendocrine Correlates of PTSD before and after Treatment
			Seattle Institute for Biomedical and Clinical Research	A Placebo-Controlled Trial of Prazosin versus Paroxetine in Combat Stress-Induced PTSD Nightmares and Sleep Disturbance
			University of Pittsburgh	
Social Work Research	4	1	State University of New York Research Foundation	Family Maltreatment, Substance Problems, and Suicidality: Randomized Prevention Effectiveness Trial
Volume Angio CAT (VAC) Research	2	0		
Total	492	40		

* Topic Area added by (HA)

Table II: FY05 PRMRP Appropriation, Withholds, and Estimated Research and Management Costs

FY05 Appropriation	$50,000,000
Less: Small Business Innovation Research	($1,250,000)
Amount Released to USAMRMC	$48,750,000
Less: Estimated USAMRMC Overhead and Management Costs	($3,956,000)
Estimated Research	$44,794,000

FY99-FY04

The total FY99-FY04 PRMRP congressional appropriation was $244.5M. Proposals were solicited in 15, 18, 31, 25, 28, and 23 topic areas, respectively. A total of 158 proposals that most effectively addressed the unique focus and goals of the PRMRP were approved for funding by the CG, USAMRMC. Detailed funding information including topic areas offered, proposals received, and awards made is provided by fiscal year in Appendix I.

Of the $244.5M appropriated to the PRMRP, $14M was managed outside the CDMRP. A total of $4M of the FY99 PRMRP appropriation was assigned to the Brooke Army Medical Center by the Office of the ASD(HA) to support a Chronic Disease Management Project, focusing on Congestive Heart Failure. Management responsibility was assigned to the USAMRMC Office of Telemedicine and Advanced Technology Research Center in FY01. Research accomplishments for this project were provided in the 2005 Report to Congress.

A total of $10M from the FY01 PRMRP appropriation was assigned to the Naval Health Research Center and managed by the Navy Bureau of Medicine and Surgery to support the Department of Defense (DOD) portion of the Leadership and Investment in Fighting an Epidemic (LIFE) Initiative. Research accomplishments for this project are provided in Appendix II.

III. ACCOMPLISHMENTS

PRMRP Response to Urgent Needs

The FY99-FY04 PRMRP-funded projects are yielding valuable research outcomes and the development and deployment of technologies relevant to military health. The flexibility of the PRMRP allows a quick response to new and changing priorities in military health. For example, the importance of early and rapid detection of biological toxins is critical given the increased threat of biological weapons in combat and bioterrorism. Understanding and treating the medical challenges to reduce mortality and morbidity associated with major battlefield wounds and injuries have been highlighted by the current US military involvement in Afghanistan and Iraq. Additionally, the US military is seeing an increase in infectious diseases in deployed personnel. The Walter Reed Army Medical Center (WRAMC) has treated several cases of cutaneous leishmaniasis affecting military personnel deployed in Afghanistan, Iraq, and Kuwait (Center for Disease Control), and hundreds more may be unknowingly infected and require earlier diagnosis and treatment.

Detection of Biological Toxins: The early and rapid detection of biological toxins is critically important to the protection of security personnel deployed in hostile situations or in instances of domestic terrorism. Biological toxins such as botulinum toxin are lethal at very low concentrations, which require detection measures that are both highly specific and extremely sensitive. There are a multitude of scenarios that may require the ability to detect biological toxins at subattomolar (10^{-18}M) concentrations or even at levels approaching a few molecules. Foremost, early detection of the use of biological toxins by terrorists will allow time for countermeasures, thus decreasing the likelihood of death or injury due to exposure. Civil and military investigative activities require attempts to identify sites of manufacture or storage of biological toxins by soil or water sampling at

considerable distances from the suspected site. Such activities may also include attempts to identify former storage sites for biological weapons after the material has been moved or even after attempted sterilization of the site. Current methods for detecting biological toxins such as immunoassays, mass spectrometry, and protein immuno-polymerase chain reaction (PCR) techniques are not well suited to the development of highly specific assay systems for detecting toxins at levels below 500 molecules in military deployment situations.

Dr. Jeffrey Mason and the researchers at the Armed Forces Institute of Pathology are generating a simple and reliable field-deployable assay system for detecting biological toxins with high specificity using immunoliposome-DNA amplification hybrids. Conditions have been optimized for an immunoliposome PCR (ILPCR) assay for cholera, tetanus, and botulinum toxins. The detection thresholds for these assays are all below 500 molecules, making them 100- to 1,000-fold more sensitive for these biotoxins than any previous assay. The detection reagents are very easy and inexpensive to prepare, and the assay is very simple to perform. This will allow the assay to be used by nonspecialists with minimal training. The ILPCR assay has been shown to work with biological and environmental samples that are likely to be encountered in "real-world" applications. Dr. Mason has designed the ILPCR assay to work with equipment that allows it to be field-deployable in a small vehicle, and he is working on a lab-chip version that will allow easy transport by individual soldiers.

Hemorrhagic Shock and Resuscitation: Trauma and hemorrhage are a leading cause of death in the United States and a major concern for the military. Significant loss of blood leads to shock: inadequate organ perfusion and tissue oxygenation. The goal of resuscitation from shock is to correct the mismatch between available oxygen and the demands of critical organs. Under-resuscitation from shock may lead to Systemic Inflammatory Response Syndrome irreversible body-wide ischemia, Multiple Organ Dysfunction Syndrome (MODS) and often death. Mortality from MODS is estimated to be between 40% and 60%. Additionally, medics carry a minimal amount of resuscitation fluids and judicious use of this resource is important in treating the largest number of casualties. Accurate endpoints of resuscitation are needed to guide therapeutic treatment, in the most efficient manner, with the goal of restoring critical tissue perfusion and oxygenation early in shock to prevent irreversible cell injury and MODS.

Dr. Babs Soller and colleagues at the *University of Massachusetts Medical School* and *Luxtex Corporation* are developing and testing a prototype, portable sensor system based on near infrared spectroscopy to noninvasively measure tissue perfusion. This system quickly and accurately measures muscle pH, muscle oxygen tension, and hematocrit from light reflected from the palm of the hand and will guide combat medical personnel in resuscitation care and evacuation. The system hardware has general application for remote spectroscopic monitoring in hazardous environments and will be less expensive than laboratory (nonportable) instruments with similar performance. Currently, 10 prototypes of the portable spectroscopic system have been designed and built under a controlled manufacturing process. The prototype device and additional units are in ongoing clinical trials and scheduled for product delivery to the USAMRMC's Core Combat Casualty Care Research Program for further field testing and evaluation.

Leishmaniasis: Leishmaniasis is a zoonotic infection caused by Leishmania protozoa through transmission by sand flies. The spectrum of human disease ranges from lesions of the skin and mucus membrane to death in its most serious form. Leishmaniasis is a common disease in tropical countries such as Iraq, Afghanistan, Mexico, and Brazil. More than 500 U.S. soldiers in Iraq,

Afghanistan, and Kuwait have been diagnosed with leishmaniasis, and hundreds more could unknowingly be infected as the parasite has an average incubation period of six months. Current disease control measures rely on the control of sand fly vectors through the use of pesticides, repellent, and insect netting. Early diagnosis and treatment of infected soldiers and patients is urgently needed to complement these methods. However, current detection of Leishmania and diagnostics for leishmaniasis takes weeks to months, requires either experienced microscopists or technicians to conduct complicated processes, and frequently needs multiple assays to improve the sensitivity and specificity of diagnostics.

IQuum Inc. has developed simple, yet elegant technology for nucleic acid testing using a pen-sized, flexible tubule, the "lab-in-a-tube" (Liat Tube™), and a hand-held Liat Nucleic Acid Analyzer. All of the reagents required for a test can be packed into the Liat Tube™ at the manufacturing plant to eliminate all of the complex reagent preparation requirements common to clinical nucleic acid testing devices. Researchers at IQuum Inc. are developing rapid sample processing protocols for skin biopsy, dermal scrapping, and aspiration samples to adapt the existing technology for the diagnosis of cutaneous leishmaniasis in forward-deployed troops. Clinical studies testing human leishmaniasis samples will be used to demonstrate the safety and utility of the IQuum system to the U.S. Food and Drug Administration. The nucleic acid analyzer, once developed, can be easily used for rapid diagnosis of other infectious diseases with further assay development.

PRMRP Coordination with USAMRMC Core Mission

The PRMRP continues to support research and technology development in all areas affecting the military, including wellness and fitness, infectious disease research, military operational medicine, and combat casualty care. The PRMRP projects complement the core research and development areas of the USAMRMC Research Area Directorates (RADs). The PRMRP staff coordinates with the RADs to avoid overlap and duplication and to help bring PRMRP-funded technologies to deployment. Several PRMRP-funded projects are in active product development.

Wellness and Fitness Research

Smoking Cessation: The prevalence of tobacco use is much higher among US military personnel than among the civilian population. *Dr. Linda Trent* and colleagues at the Naval Health Research Center are developing and testing a self-contained video-based tobacco cessation intervention aimed at addressing this problem. Thus far, Dr. Trent has completed baseline data collection and video intervention of more than 12,000 US Marine Corps (USMC) participants. Her data indicate a 49% prevalence of smoking among USMC recruits, a 9% higher daily use of tobacco as compared with the civilian cohort, a prevalence of smokeless tobacco use six times higher than among the civilian cohort, and 20% of Caucasian and Native American recruits both used cigarettes and smokeless tobacco. An educational approach specifically for smokeless tobacco cessation is being applied by *Dr. Herbert Severson* at the Oregon Research Institute. A brief tobacco cessation intervention that can easily be incorporated into a dental examination may be more effective for smokeless tobacco users than a structured group program. The treatment program incorporates proactive recruitment through motivational interviewing and has proven successful in a large study with a civilian population as well as a pilot study with Air Force personnel. A total of 24 dental clinics at 21 military bases have begun enrolling subjects in the program. Formal enrollment of participants has begun at 14 additional military sites.

Alcohol Abuse: Alcohol misuse has been identified as an important factor in aggressive behavior in humans. Therefore, the military is attempting to deglamorize alcohol use and reduce alcohol abuse among its military personnel. *Dr. Andrea Allan* and colleagues at the University of New Mexico are examining the impact of serotonin receptor 3 (5HT3) overexpression on alcohol preference, natural aggressive behavior, and alcohol-heightened behavior. Previous studies indicating that the 5HT3 receptor system mediates alcohol consumption and the subjective effects of alcohol are supported by Dr. Allan's work. Results of studies in mice indicate that overexpression of 5HT3 reduces alcohol preference and decreases the display of aggressive behavior. An important outcome of this work is the development of a mouse model for fetal alcohol exposure.

Infectious Disease Research

Malaria: Treatment of malaria is becoming increasingly difficult because of the emergence of multidrug-resistant strains of *Plasmodium falciparum* (*P. falciparum*), causative agent of the most severe form of the disease. As a result, there is a pressing need to develop novel antimalarial agents. *Dr. Michael Riscoe* of the Portland, Oregon Veterans Affairs Medical Center has shown that naturally occurring hydroxyxanthones appear to disrupt the stage in which malaria parasites live in human blood cells by interfering with the parasites' ability to dispose of toxic waste products. Dr. Riscoe has synthesized two hydroxyxanthone analogs and performed preliminary studies in a mouse malaria model. The drugs were nontoxic to the mice and reduced the parasitemia of malaria by 90%. *CAPT Thomas Richie* and colleagues at the Naval Medical Research Center in Silver Spring, Maryland are developing a malaria vaccine strategy that combines a DNA priming vaccine with a multi-component recombinant adenovirus vaccine boost containing several antigens of *P. falciparum*. This study will incorporate animal toxicity studies and human clinical trials in down-selecting appropriate vaccine regimens for further development.

Dengue: Dengue Fever is a mosquito-borne viral disease endemic in tropical regions around the world. Dengue vaccines use attenuated viruses in clinical trials. DNA vaccines have the potential to give a more robust immune response, but have shown only partial protection to live virus challenge in mice and primates. *Dr. Kevin Porter* and colleagues at the Naval Medical Research Center are currently using mice as a model to explore the use of tetanus toxoid, aluminum phosphate, and monoclonal antibodies as adjuvants to improve the efficacy of the DEN-1 and DEN-2 DNA vaccines.

Diarrhea: Diarrhea is a significant health threat for military and civilian travelers to developing countries. Incidence rates as high as 50% occur where food and water sanitation is poor. The military requirement for solutions in this area is becoming more acute. Since the inception of the war on terrorism, the global commitment of US fighting forces has been increasingly concentrated in developing areas of the world. Rehydration and antibiotic treatment are the cornerstones of disease management, but even with early institution of appropriate therapy, diarrheal diseases exact a cost in terms of lost duty and effectiveness. There is no licensed drug or biologic that provides a safe, effective mode of prevention, leaving an important deficiency in military and travel medicine. *CAPT Stephen Savarino* at the Naval Medical Research Center in collaboration with Johns Hopkins University is developing bovine milk immunoglobulins (BIgG) as a supplement with activity against enterotoxigenic *Escherichia coli*, the predominant cause of traveler's diarrhea. This investigational treatment, which has shown proof of principle as a safe, food-based antidiarrheal supplement, is slated to begin clinical trials in 2006.

Military Operational Medicine Research

Acute lung injury (ALI) and acute respiratory distress syndrome (ARDS) are life-threatening conditions in which inflammation of the lungs and accumulation of fluid in the air sacs (alveoli) lead to low blood oxygen levels. ALI or ARDS can result from severe traumatic injury, hemorrhage, severe burns, and inhalation of smoke or chemicals, and mortality rates are 20%-60%. *Dr. Leopoldo Cancio* at the US Army Institute of Surgical Research is exploring the use of an intravenous membrane oxygenator implanted directly in the vena cava to provide improved oxygen/carbon dioxide exchange in the blood without a large external pump, using sheep as a model. An alternative approach is being taken by *Dr. Vladimir Muzykantov* of the University of Pennsylvania. Deposition of fibrin and blood clots in the lungs and oxidative stress in the lung vasculature contribute to ALI and ARDS. Delivering antioxidant and clot-dissolving enzymes directly to the lungs could help prevent the lung inflammation that leads to low blood oxygen levels. A pilot toxicity study has revealed that prolonged exposure of human cells to these nanocarriers does not affect cell number, morphology of the endothelial monolayer, or cell viability. Dr. Muzykantov is currently testing antibody delivery systems in mice, with plans to advance to larger animal models.

Asthma is the leading cause of chronic disease in childhood and has a marked impact on military families. Management of childhood asthma requires effective medical therapy, adherence to the medical therapy, and patient education and monitoring. Estimates about the prevalence of asthma among children and adolescents under the age of 18 range up to 7%. *Dr. Shibata* and colleagues at Florida Atlantic University have identified a promising preventive treatment for asthma. 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. Oral administration of chitin represents a potentially effective treatment for IgE-mediated allergic disease, especially for childhood asthma.

Researchers at the Tripler Army Medical Center designed an Internet-based, in-home asthma monitoring system for children. In addition to attending a pediatric asthma clinic at regular intervals, participants are provided with home computers with Internet access and they are monitored over the Internet. Therapeutic monitoring includes digital videos of patients using their controller medication inhaler and videos of peak flow meter use. Videos are submitted electronically twice a week by using in-home telemonitoring with store-and-forward technology. In a small pilot test, participants improved their inhaler use technique and hospital visits were reduced. *COL Charles Callahan* and colleagues are conducting a large scale trial of the Internet-based asthma monitoring system, comparing patients' quality of life, utilization of services, rescue-therapy use, symptom control, and retention of asthma knowledge in groups using the Internet system or a traditional office-based education system. The technology could allow military families of children afflicted by asthma to be monitored at a distance from medical centers or clinics, but still benefit from the close care of asthma experts, reducing the psychological burden as well as the costs associated with such care.

Remote surgical capability (i.e., telesurgery) could be used in the battlefield to improve the care of wounded military personnel in the critical hour after injury. Such technology also would benefit civilian medical care in rural areas. *Dr. Blake Hannaford* of the University of Washington is

developing a miniature surgical robot system and has completed a prototype based on kinematic analysis of surgical performance. The prototype allowed maximal dexterity throughout the surgical space and included a flexible manipulator for surgical tools. Dr. Hannaford will test the prototype robot in surgery on pigs and determine the learning curve on the robot for experienced surgeons.

Making fresh blood products available in field or remote situations is a challenge for the Armed Forces. Researchers at Mission Medical, Inc. in Fremont, California, developed a prototype automated red blood cell processing system for preparing blood for transfusions. This prototype rapidly performs the freezing, thawing, and reconstitution of whole red blood cells in a sterile closed loop system, resulting in a liquid blood product that can be refrigerated for up to 2 weeks. Under the direction of *Dr. Thomas Robinson*, Mission Medical has designed modifications to the disposables and hardware to improve manufacturability and decrease cost, performed regulatory studies, and performed field testing at military sites (US Navy, Armed Services Blood Program, and WRAIR, 2005) to demonstrate the practicality, acceptance, and fulfillment requirements by this system. The system has been offered to the Armed Services Blood Program and a reply is pending.

Pseudofolliculitis barbae (PFB or shaving bumps) is an inflammatory condition of the beard area, usually observed in dark skinned men with thick, coarse hair who shave regularly. Currently available depilatories, topical creams, and PFB razors do not offer a permanent definitive answer for PFB and, at best, ameliorate the condition only temporarily. PFB can impact force readiness, compromise the ability to wear close-fitting protective facial gear, and affect the soldier's quality of life. This condition is considered a significant dermatologic disease in the US Army; it affects more than 50% of African American servicemen. Laser- and lamp-based modalities that were initially developed for removal of unwanted body hair have the potential to provide a curative solution to the problem. Palomar Medical Products, Inc. is developing a self-operated, portable, low irradiance PFB treatment device that can be used by individuals without physician supervision. Clinical trials are ongoing at the Naval Medical Research Center in San Diego, and Brooks Army Medical Center and Wilford Hall in San Antonio using a larger, physician operated system. This project will be transitioning to advanced development within USAMRMC later in 2006.

Combat Casualty Care Research

Impaired healing of war wounds is a serious military medical problem. Wound healing could be improved by targeting cellular growth factors to wounds. Gene therapy can deliver growth factors continuously deep within the tissue to maximally enhance healing. The potential of gene therapy has not been exploited because the technology to deliver the genes has not been successful. *Dr. John Harmon* and colleagues at Johns Hopkins University are using electroporation, in which an electric field passed through tissue opens small pores in cell membranes to successfully deliver DNA molecules into cells. The Johns Hopkins team used mouse models to study the effect of delivering the gene for keratinocyte growth factor (KGF) by electroporation. The technique improved the speed of closure in slow-healing wounds produced experimentally in mice. An additional benefit of this technique may be the treatment of slow wound healing in diabetics as observed in diabetic mice having KGF delivered into wounds by electroporation. Dr. Harmon has improved wound healing quality with the KGF-1 plasmid DNA therapy and improved plasmid transfection into a rat model. Multiple growth factors do not improve wound closure compared with KGF-1 alone and do not effect collagen levels in final wound biopsy.

Patients with spinal cord injury (SCI) suffer from numerous (neurological, renal and gastrointestinal) complications, with a majority in a state of chronic pain. Accordingly, many of these patients are on antiinflammatory, analgesic, and narcotic drugs, each of which has its own deleterious side effects. The use of nonsteroidal anti-inflammatory drugs (NSAIDs), which have potent anti-inflammatory and analgesic activity in patients with SCI has been limited because of the drugs' gastrointestinal (GI) side effects, which may result in peptic ulceration, hemorrhage, and anemia, can be particular devastating in a debilitated patient. *Dr. Lenard Lichtenberger* is investigating the use of a new class of NSAIDs coupled with phosphatidylcholine (PC) in the treatment and/or prevention of chronic neuropathic pain associated with SCI. Preliminary results in rodent model systems show that PC–NSAIDs have a lower GI toxicity and more enhanced therapeutic effectiveness than the parent NSAID to inhibit fever, inflammation, and pain. Positive results in these preclinical studies should, in turn, hasten the development of PC–NSAID formulations for parenteral and enteral use for improved treatment of patients suffering from Chronic Pain Syndrome.

Projects Managed by USAMRMC TATRC and BUMED

A summary of the Chronic Disease Management Project, focusing on congestive heart failure research conducted at the University of Texas Disease Management Center was provided in Appendix II of the PRMRP 2005 Report to Congress; please contact Dr. Gerry Moses at 301-619-4000 or moses@tatrc.org for more information. A progress update for the DHAPP project, which is carried-out at the Naval Health Research Center in San Diego, can be found in Appendix II.

IV. SUMMARY

The PRMRP continues to fulfill congressional intent by funding research of clear scientific merit with direct relevance to the health of the warfighter, the military family, and the American public. The FY99-FY05 PRMRP congressional appropriation totaled $294.5M and provided funding for 198 projects in 60 topic areas. Many of the projects funded by the PRMRP have begun to yield combat health support technologies and products in the areas of Combat Casualty Care, Military Infectious Diseases, Military Operational Medicine, Chronic Disease Management and Medical Chemical and Biological Defense, thus complementing current USAMRMC Core priorities. The FY06 PRMRP is underway and is expected to continue attracting exciting research and technology development.

USAMRMC Point of Contact is Colonel Janet Harris, 301-619-7071,
Janet.Harris2@det.amedd.army.mil

APPENDICES

APPENDIX I – PRMRP FUNDING SUMMARIES

Table I: FY99 DHRP Funding Outcomes by Topic Area and Institution

Topic Area	Institution	Budget
Alcoholism Research	The Nathan S. Kline Institute for Psychiatric Research	$475,282
Alcoholism Research	University of New Mexico Health Sciences Center	$715,039
Alcoholism Research	Louisiana State University Health Sciences Center	$510,217
Alcoholism Research	Research Triangle Institute	$1,608,635
Alcoholism Research	University of New Mexico Health Sciences Center	$387,460
Alcoholism Research	University of Minnesota School of Medicine	$607,086
Alcoholism Research	Tripler Army Medical Center	$230,120
Chemical Weapons Treatment	Uniformed Services University of the Health Sciences	$1,283,218
Disease Management	Walter Reed Army Medical Center	$744,500
Healthcare Information Protection	University of California at San Francisco	$916,343
Lung Research	Naval Health Research Center	$425,337
Pediatric Asthma	Brooke Army Medical Center	$75,329
Pediatric Asthma	State University of New York at Buffalo	$209,778
Sleep Management	Walter Reed Army Institute of Research	$1,758,569
Sleep Management	NTI, Inc.	*$1,680,170
Smoking Cessation	University of Minnesota	$2,774,406

*Grant was funded with FY99 research dollars in the amount of $1,269,274 and FY02 research dollars in the amount of $155,896 and FY04 research dollars in the amount of $255,000.

Table II: FY00 PRMRP Funding Outcomes by Topic Area and Institution

Topic Area	Institution	Budget
Advanced Soft Tissue Modeling	Massachusetts General Hospital	$1,968,490
Advanced Soft Tissue Modeling	Cleveland Clinic Foundation	$1,845,080
Alcohol Abuse Prevention Research	University of New Mexico	$525,212
Alcohol Abuse Prevention Research	Pacific Institute for Research and Evaluation	$964,853
Alcohol Abuse Prevention Research	University of New Mexico	$1,336,262
Alcohol Abuse Prevention Research	Johns Hopkins University	$1,191,816
Childhood Asthma	Tripler Army Medical Center	$1,547,400

Topic Area	Institution	Budget
Defense and Veterans Head Injury Program	National Institutes of Health, Bethesda	*$2,405,483
Defense and Veterans Head Injury Program	US Army Aeromedical Research Laboratory	$948,121
Dengue Fever Vaccine Research	Naval Medical Research	$439,850
Gulf War Illnesses	Wake Forest University School of Medicine	$790,884
Gulf War Illnesses	Walter Reed Army Medical Center	$445,078
Militarily Relevant Disease Management	Naval Submarine Medical Research Laboratory	**$5,826,062
Militarily Relevant Disease Management	Walter Reed Army Medical Center	$1,730,872

*Grant was funded with FY00 research dollars in the amount of $2,133,483 and FY02 research dollars in the amount of $272,000.
**Grant was funded with FY00 research dollars in the amount of $5,326,062 and FY02 research dollars in the amount of $500,000.

Table III: FY01 PRMRP Funding Outcomes by Topic Area and Institution

Topic Area	Institution	Budget
Acute Lung Injury Research	University of Arizona	$1,268,823
Acute Lung Injury Research	Johns Hopkins University	$386,236
Acute Lung Injury Research	University of Pennsylvania	$1,283,287
Acute Lung Injury Research	Northeastern University	$113,137
Acute Lung Injury Research	Atlanta Research and Education Foundation	$671,010
Acute Lung Injury Research	Johns Hopkins University	*$2,013,226
Alcohol Abuse Prevention Research	University of Illinois at Chicago	$1,042,703
Arthropod-Transmitted Infectious Disease	University of Connecticut Health Center	$894,632
Arthropod-Transmitted Infectious Disease	Albert Einstein College of Medicine	$1,053,074
Arthropod-Transmitted Infectious Disease	Albert Einstein College of Medicine	$1,185,539
Arthropod-Transmitted Infectious Disease	University of Texas Medical Branch	$1,284,529
Biological Hazard Detection System/Bio-sensor Microchip	American Registry of Pathology	$382,691
Childhood Asthma	West Virginia University Research Corporation	$898,623
Childhood Asthma	Lackland Air Force Base	$652,675
Childhood Asthma	University of Minnesota	$1,672,392

Topic Area	Institution	Budget
Digital Mammography Imaging	University of Michigan	$1,717,673
Fungi Free	Ganeden Biotech, Inc.	$319,745
Gulf War Illnesses	Veterans Affairs Medical Center	$1,689,945
Gulf War Illnesses	Armed Forces Radiobiology Research Institute	$382,829
Gulf War Illnesses	Naval Health Research Center	$696,627
Laser Eye Injury/Eye Cancer Research and Treatment	Brooks Air Force Base	$756,250
Laser Eye Injury/Eye Cancer Research and Treatment	Johns Hopkins University	$549,638
Medical Surgery Technology	University of Washington	$1,198,256
Militarily Relevant Disease Management	University of Miami School of Medicine	$739,056
Militarily Relevant Disease Management	Johns Hopkins University	$243,452
Militarily Relevant Disease Management	Naval Health Research Center/ University of Ottawa	$1,363,241
Militarily Relevant Disease Management	University of Illinois College of Medicine	$965,931
Militarily Relevant Disease Management	Walter Reed Army Institute of Research	$191,715
Militarily Relevant Disease Management	Tripler Army Medical Center	$1,817,797
Molecular Biology for Cancer Research	Thomas Jefferson University	$965,282
Molecular Biology for Cancer Research	Walter Reed Army Medical Center	$734,261
Molecular Biology for Cancer Research	Thomas Jefferson University	$802,398
Obesity Related Disease Prevention (esp. for minorities)	Baylor College of Medicine	$964,601
Remote Emergency Medicine Ultrasound	GE Corporate Research and Development	$1,992,742
Sleep Management	Veterans Medical Research Foundation	$1,701,135
Smoking Cessation	Oregon Research Institute	$1,949,634
Smoking Cessation	Naval Health Research Center	$465,267

* Grant was funded with FY01 research dollars in the amount of $645,851 and FY02 research dollars in the amount of $1,367,375.

Table IV: FY02 PRMRP Funding Outcomes by Topic Area and Institution

Topic Area	Institution	Budget
Acute Lung Injury Research	US Army Institute of Surgical Research	$1,980,400
Chemo-Preventative Approaches to Smoking-Related Illness	University of Arizona	$1,261,963
Childhood Asthma	East Carolina University	$920,999
Closed-Loop Frozen Blood Processing Systems	Mission Medical, Inc.	$1,499,916
Dengue Fever Vaccine	Naval Medical Research Center	$1,079,876
High Risk Infectious Disease	UCLA School of Medicine	$1,850,112
High Risk Infectious Disease	Veterans Affairs Medical Center	$763,680
High Risk Infectious Disease	Virginia Tech	$1,068,111
Laser Eye Injury	Uniformed Services University of the Health Sciences	$1,599,027
Metabolically Engineered Tissue for Trauma Care	Johns Hopkins University	$340,355
Military Nutrition Research	Uniformed Services University of the Health Sciences	$1,558,944
Military Nutrition Research	University of North Dakota	$621,359
Military Relevant Disease Management	Albert Einstein College of Medicine	$2,933,914
Military Relevant Disease Management	Tripler Army Medical Center	$353,180
Military Relevant Disease Management	University of Massachusetts Medical School	$1,109,402
Military Relevant Disease Management	University of Texas Southwestern Medical Center	$1,561,796
Military Relevant Disease Management	Oregon Health and Science University	$1,902,417
Military Relevant Disease Management	Virginia Commonwealth University	$2,849,627
Military Relevant Disease Management	Thomas Jefferson University	$2,729,639
Military Relevant Disease Management	US Air Force-SG	$506,500
Military Relevant Disease Management	Naval Health Research Center	$164,494
Paget's Disease	University of Pittsburgh	*$1,045,662

Topic Area	Institution	Budget
Pre-Clinical and Clinical Activities of the Novonex/ Ex-Rad Drugs	Armed Forces Radiobiology Research Institute	$1,584,656
Radiation Protection	Armed Forces Radiobiology Research Institute	$881,091
Real-Time Heart Rate Variability	Midwest Research Institute	$891,141
Sleep Management	Northeastern Ohio University College of Medicine	$640,572
Smoking Cessation	Research Triangle Institute	$2,192,298
Social Work Research	State University of New York at Stony Brook	$1,553,178
Traumatic Brain Injury	University of Florida	$2,168,431
Traumatic Brain Injury	Walter Reed Army Medical Center	$2,486,224
Traumatic Brain Injury	University of Maryland, Baltimore	$1,461,337

* Grant was funded with FY02 research dollars in the amount of $834,271.37 and FY03 research in the amount of $211,390 63

Table V: FY03 PRMRP Funding Outcomes by Topic Area and Institution

Topic Area	Institution	Budget
Acellular Matrix Research for Military Orthopedic Trauma	Baylor College of Medicine	$649,767
Acellular Matrix Research for Military Orthopedic Trauma	Baylor College of Medicine	$729,316
Alcoholism Research	Research Triangle Institute	$1,453,018
Amyotrophic Lateral Sclerosis	State University of New York, Albany	$1,152,744
Anti-Diarrhea Supplement	Naval Medical Research Center	$3,704,331
Army Nutrition Research	US Army Research Institute of Environmental Medicine	$592,739
Bone-Related Disease Research	Baylor College of Medicine	$729,316
Casualty Care Research Center	Oregon Health Sciences University	$986,699
Casualty Care Research Center	Children's Hospital, Boston	$563,678
Cell Response to Anti-Cancer Agents	University of Maryland, Baltimore	$1,458,857
Epilepsy	Uniformed Services University of the Health Sciences	$1,225,862

Topic Area	Institution	Budget
Infectious Disease Tracking System	Foundation for Health Care Quality	$2,537,937
Interstitial Cystitis Research	University of Iowa	$973,009
Low Vision Research	Schepens Eye Research Institute	$2,987,463
Military Relevant Disease and Injury	University of Connecticut, Farmington	$1,732,296
Military Relevant Disease and Injury	Children's Hospital, Cincinnati	$2,562,548
Military Relevant Disease and Injury	Palomar Medical Products, Inc.	$2,499,596
Military Relevant Disease and Injury	Massachusetts General Hospital	$1,760,289
Military Relevant Disease and Injury	Naval Health Research Center	$1,041,751
Military Relevant Disease and Injury	Lovelace Respiratory Research Institute	$524,200
Military Relevant Disease and Injury	Lovelace Respiratory Research Institute	$1,828,876
Military Relevant Disease and Injury	Southern Research Institute	$1,749,271
Military Relevant Disease and Injury	Southern Research Institute	$3,987,925
Military Relevant Disease and Injury	Naval Health Research Center	$811,304
Military Relevant Disease and Injury	Naval Health Research Center	$487,270
Military Relevant Disease and Injury	Mount Sinai School of Medicine	$2,499,738
Neuroscience Research	Boston University, Boston Campus	$1,021,862
Paget's Disease	University of Pittsburgh	$1,045,662
Respiratory Research	Walter Reed Army Institute of Research	$2,175,347
Smoking Cessation	San Diego State University Foundation	$134,547
Social Work Research	Research Triangle Institute	$1,435,384

Table V: FY04 PRMRP Funding Outcomes by Topic Area and Institution

Topic Area	Institution	Budget
Alcoholism Research	Oregon State University	$1,255,745
Amyotrophic Lateral Sclerosis	Johns Hopkins University	$1,260,682

Topic Area	Institution	Budget
Amyotrophic Lateral Sclerosis	Harvard University	$1,527,936
Blood-Related Cancer Research	University of Pennsylvania	$1,972,773
Blood-Related Cancer Research	Mount Sinai School of Medicine	$1,279,507
Childhood Asthma	Emory University	$1,000,000
Chronic Pain Research	University of Texas Health Science Center-Houston	$1,789,202
Epilepsy	University of Pennsylvania	$1,999,939
Geneware Rapid Vaccine	Brentwood Biomedical Research Institute	$372,587
Limb Loss and Paralysis Research	Boston VA Research Institute, Inc.	$1,493,932
Limb Loss and Paralysis Research	Case Western Reserve University	$1,749,133
Lung Cancer Screening	University of Pittsburgh	$656,841
Malaria Vaccine Initiative	Henry M. Jackson Foundation	$1,981,866
Malaria Vaccine Initiative	Seattle Biomedical Research Institute	$2,006,516
Military Relevant Disease Management	IQuum, Inc.	$1,942,997
Military Relevant Disease Management	New York Medical College	$1,573,916
Military Relevant Disease Management	Brentwood Biomedical Research Institute	$1,950,760
Military Relevant Disease Management	Henry M. Jackson Foundation	$1,204,207
Military Relevant Disease Management	University of Alabama at Birmingham	$1,600,000
Military Relevant Disease Management	University of California, San Diego	$1,346,672
Military Relevant Disease Management	Albert Einstein College of Medicine of Yeshiva University	$1,732,333
Muscle Function Research	University of Iowa	$1,975,220
Muscle Function Research	University of Illinois at Chicago	$1,466,307

Topic Area	Institution	Budget
Osteoporosis and Bone Related Disease Research	University of Michigan	$1,088,879
Osteoporosis and Bone Related Disease Research	Oregon Health & Science University	$1,721,331
Osteoporosis and Bone Related Disease Research	Southwest Research Institute	$1,544,717
Post-Traumatic Stress Disorder	Brown University	$982,926
Reserve Component Medical Training Program	University of Miami School of Medicine	$1,953,840
Smoking Cessation	Nova Southeastern University	$1,574,915

Table VI: FY99-05 PRMRP Summary

	FY99	FY00	FY01	FY02	FY03	*FY04	FY05
Appropriations	$19.5M	$25M	$50M	$50M	$50M	$50M	$50M
Topic Areas Offered	15	18	31	25	28	25	23
Proposals Received	90	163	180	125	298	305	TBD**
Number of Awards	16	14	37	31	29	28	TBD**

*Award negotiations are under way
**To be determined

APPENDIX II – DEPARTMENT OF DEFENSE HIV/AIDS PREVENTION PROGRAM (DHAPP)

Background: Currently, the continent of Africa is the epicenter of the Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) epidemic. Many militaries and other uniformed organizations in Africa are experiencing readiness problems resulting from high rates of HIV/AIDS among their personnel. The US Government began an initiative in Fiscal Year 2001 (FY01) to help fight the HIV/AIDS epidemic in Africa and India. The Navy was assigned as the Executive Agent for the Department of Defense (DOD) international HIV/AIDS prevention activities. The program is being managed by the Naval Health Research Center in San Diego.

Funding History: In FY01, the DOD identified $10M to begin the Program. Continued funding was provided to DHAPP in FY02 through a $14 million (M) "congressional add" to the Defense Health Program. In FY03 Congress provided by at $7M for the Program, and the language expanded the opportunity for HIV/AIDS cooperation with militaries outside of Africa. The FY04 congressional add to the Defense Health Program for Global HIV Prevention was $4.25M. In FY04 additional funding was provided to the DOD for support of militaries in selected countries through the President's Emergency Plan for AIDS Relief (PEPFAR). In FY05 DHAPP received $7.5 million in direct congressional funding as well as continuing support through PEPFAR.

Objectives of the DOD HIV/AIDS Prevention Program

1. Assist in developing and implementing military-specific HIV prevention programs.

2. Integrate with, and make use of, other US Government programs and those managed by allies and the United Nations.

Implementation Strategy: DHAPP has a bilateral and regional strategy for HIV/AIDS cooperation and security assistance. Using country priorities set by the Under Secretary of Defense (USD) for Policy, implementation of the bilateral strategy begins by coordinating with the responsible Combatant Commander and US Country Team to offer military-to-military assistance with HIV/AIDS prevention. Receptive defense forces are requested to submit an overall HIV/AIDS prevention plan to DHAPP for evaluation. Onsite visits and the submitted plan are used by DHAPP to determine gaps and areas eligible for technical assistance and resource support. DHAPP provides technical assistance and resource support to defense forces in the following areas: (1) HIV screening, (2) surveillance, (3) voluntary counseling and training, (4) peer education, (5) instructor training, (6) sexually transmitted infections syndromic management, (7) mass awareness campaigns, (8) communication and coordination, and (9) occupational exposure intervention, (10) infrastructure development, and (11) clinical education.

Status: As of 31 December 2005, the Program has established links with militaries in 71 countries around the world. Immediate successes have included: (1) establishing HIV/AIDS prevention programs in militaries with no prior program; (2) coordinating access of uniformed personnel to existing US Government, US Agency for International Development, and Centers for Disease Control and Prevention efforts, and host country HIV/AIDS programs; (3) continuing to providing staff in-country for HIV/AIDS prevention programs; (4) providing materials and consultation to

develop country-specific behavioral intervention programs; and (5) fully integrating into the PEPFAR strategy and management process. The Program accomplishes these efforts mainly through direct military-to-military cooperation but limited support is provided through contracting external organizations to support specific aspects of a proposed program. In addition, the training program established in 2004 for HIV/AIDS practitioners from militaries assisted by the Program has now been expanded to include training at an African care and research center.

Accomplishments in FY05

1. Provided HIV technical assistance and resource support affecting more than 6 million uniformed personnel in 71 countries.

2. Supported 258 counseling and testing centers, at which 64,157 troops were tested for HIV and received their results

3. Reached 337,733 troops and family members with prevention messages

4. Trained 5,166 military members as peer educators

5. Provided 5,407 uniformed personnel with HIV-related palliative care and trained 906 military health providers in the provision of that care.

6. Trained 305 uniformed health providers in antiretroviral therapy techniques, equipped twenty-six laboratories to provide HIV and/or CD4 testing, and trained 128 laboratory technicians to provide those tests.

FY06 Strategy

The Program strategy for FY06 will be characterized by the following:

1. Continue integration with the State Department office of the Global AIDS Coordinator to expand military programs in the focus countries of the President's Emergency Plan for AIDS Relief (PEPFAR), as well as strengthen military programs in the other PEPFAR countries (OPC).

2. Expand and strengthen existing capability and support to militaries in sub-Saharan Africa, with approximately 65% of effort and funding directed to militaries in that part of world.

3. Expand involvement and integration of DOD Board of Directors for international HIV activities.

4. Increase integration of the Program with US Theater Security Cooperation Plans.

5. Further integrate partner military HIV prevention programs with local and national health programs, US Government agencies, and international HIV assistance organizations.

6. Continue and expand clinical education programs.

Point of Contact and DHAPP Program Manager is LCDR Matthew Lim; Phone: 619-553-8528, DSN: 553-8528; Fax: 619-553-8383; e-mail: **lim@nhrc.navy.mil**; Internet: URL: **http://www.nhrc.navy.mil/programs/dhapp/index.html**.

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109TH CONGRESS
Report
HOUSE OF REPRESENTATIVES

1st Session

109-359

--MAKING APPROPRIATIONS FOR THE DEPARTMENT OF DEFENSE FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 2006, AND FOR OTHER PURPOSES

December 18, 2005- Ordered to be printed
Mr. YOUNG of Florida, from the committee of conference, submitted the following
CONFERENCE REPORT

[EXTRACT]

PEER REVIEWED MEDICAL RESEARCH PROGRAM

The Senate recommended $50,000,000 for a Peer Reviewed Medical Research program. The conferees agree to provide $50,000,000 for this program, and recommend the following projects as candidates for study: advanced proteomics; alcoholism research; autism; blood-related cancer research such as leukemia, lymphoma, and multiple myeloma; childhood asthma; chronic pain and fatigue research; childhood cancer research; diabetes research; Duchenne's disease research; eye and vision research; fibromyalgia; Interstitial Cystitis Syndrome; kidney cancer research; Lupus Research; osteoporosis and bone-related diseases; polycystic kidney disease; pulmonary hypertension; Padget's disease; post traumatic stress disorders; social work research; and autoimmune diseases such as sclcroderma and Sjogren's syndrome.

The conferees direct the Department to provide a report by March 1, 2006, on the status of this Peer Reviewed Medical Research Program.

25-159

109TH CONGRESS
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[EXTRACT]

PEER REVIEWED MEDICAL RESEARCH PROGRAM

The Senate recommended $50,000,000 for a Peer Reviewed Medical Research program. The conferees agree to provide $50,000,000 for this program, and recommend the following projects as candidates for study: advanced proteomics; alcoholism research; autism; blood-related cancer research such as leukemia, lymphoma, and multiple myeloma; childhood asthma; chronic pain and fatigue research; childhood cancer research; diabetes research; Duchenne's disease research; eye and vision research; fibromyalgia; Interstitial Cystitis Syndrome; kidney cancer research; Lupus Research; osteoporosis and bone-related diseases; polycystic kidney disease; pulmonary hypertension; Padget's disease; post traumatic stress disorders; social work research; and autoimmune diseases such as scleroderma and Sjogren's syndrome.

The conferees direct the Department to provide a report by March 1, 2006, on the status of this Peer Reviewed Medical Research Program.