



# **ANNUAL REPORT TO CONGRESS**

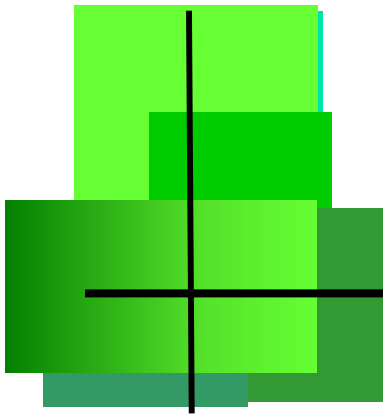
## **Federally Sponsored Research on Gulf War Veterans' Illnesses for 2000**

### **A P P E N D I C E S**



October 2001

**Research Working Group of Military and Veterans Health Coordinating Board**



# Annual Report to Congress – 2000

## APPENDICES

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### *Research on Gulf War Veterans' Illnesses*

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# ANNUAL REPORT TO CONGRESS

## Federally Sponsored Research on Gulf War Veterans' Illnesses for 2000

### APPENDICES

#### Table of Contents

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<b>APPENDIX A</b>	Federally Funded Research Projects	
A 1	Project Index by Department	p 1
A 2	Project List by Research Focus Areas	p 13
A 3	Project Funding	p 29
 <b>APPENDIX B</b>	Proceedings from the 2001 Conference on Illnesses Among Gulf War Veterans: A Decade of Scientific Research	 p 55
 <b>APPENDIX C</b>	Summary of Progress in Response to the 21 Research Questions Highlighted in the 1996 <i>Working Plan for Research on Gulf War Veterans' Illnesses</i>	 p 123

# **Appendix A 1**

## **Project Index By Department**

## DEPARTMENT OF DEFENSE

DoD-1	Naval Health Study Program
DoD-1A	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; A Study of Symptoms Among 1500 Seabees
DoD-1B	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 2: A Comparative Study of Hospitalizations among Active-Duty Personnel Who Participated in the Gulf War and Similar Personnel Who Did Not.
DoD-1C	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 3: A comparative study of pregnancy outcomes among Gulf War veterans and other active-duty personnel
DoD-1D	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 4: Infertility and Miscarriage in Gulf War Veterans
DoD-1E	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 5: Seabee Health Study
DoD-1F	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 6: A Comparison of Nonfederal Hospitalization Experience Among Veterans in California who have separated from active service: PGW vs. EV
DoD-1G	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 7: Prevalence of Congenital Anomalies Among Children of Persian Gulf War Veterans
DoD-2	Physiological and Neurobehavioral Effects in Rodents from Exposure to Pyridostigmine, Fuels, and DEET
DoD-4	The General well-being of Gulf War Era Service Personnel from the States of Pennsylvania and Hawaii: A Survey
DoD-7A	Health Risk Assessment of Embedded Depleted Uranium: Behavior, Physiology, Histology, and Biokinetic Modeling
DoD-7B	Carcinogenicity of Depleted Uranium Fragments
DoD-8	Program DoD-8
DoD-8A	Serologic Diagnosis of Viscerotropic Leishmaniasis (VTL)
DoD-8B	Development of a Leishmania Skin Test Antigen (LSTA)
DoD-9	Identification of the Genetic Factors Which Control Tropism in Leishmania
DoD-10	Pyridostigmine Synergistic Toxicity Study

DoD-11	Male/Female Differential Tolerances to Pyridostigmine Bromide
DoD-13	Effects of Persian Gulf War Service on Military Working Dogs
DoD-14	Risk Factors Among US Army Soldiers for Enrolling on the Department of Veterans Affairs Gulf War Registry
DoD-15	Comparative Mortality Among US Military Personnel Worldwide During Operations Desert Shield and Desert Storm
DoD-16	Kuwait Oil Fire Health Risk Assessment
DoD-17	Retrospective Studies Involving Military Use of Pyridostigmine as a Pretreatment for Nerve Agent Poisoning
DoD-18	Kuwait Oil Fires Troop Exposure Assessment Model (TEAM)
DoD-19	Persian Gulf Veterans Health Tracking System
DoD-21	Study of Variability In Pyridostigmine Inhibition of Blood Cholinesterases in Healthy Adults and Individuals With Symptoms Following Participation in Operation Desert Storm
DoD-22	Chronic Organophosphorus Exposure and Cognition
DoD-23	Acute and Long-Term Impact of Deployment to Southwest Asia on the Physical and Mental Health of Soldiers and their Families
DoD-30	Epidemiological Studies Persian Gulf War Illnesses, PG Women's Health Linkage Study
DoD-31	Dysregulation of the Stress Response in the Persian Gulf Syndrome
DoD-32	Neuropsychological Functioning in Persian Gulf Era Veterans
DoD-33	Effects of Pyridostigmine in Flinders Line Rats Differing in Cholinergic Sensitivity
DoD-34	Characterization of Emissions from Heaters Burning Leaded Diesel Fuel in Unvented Tents
DoD-35	Feasibility of Investigating Whether There is a Relationship Between Birth Defects and Service in the Gulf War.
DoD-36	Fatigue in Persian Gulf Syndrome-Physiologic Mechanisms
DoD-37	Neurobehavioral and Immunological Toxicity of Pyridostigmine, Permethrin, and DEET in Male and Female Rats

DoD-38	Diagnostic Antigens of <i>Leishmania tropica</i>
DoD-39	A Controlled Epidemiological and Clinical Study into the Effect of Gulf War Service on Servicemen and Women of the United Kingdom Armed Forces
DoD-40	Psychological and Neurobiological Consequences of the Gulf War Experience
DoD-41	Evaluation of Muscle Function in Persian Gulf Veterans
DoD-42	The Symptomatic Persian Gulf Veterans Protocol: An Analysis of Risk Factors with an Immunologic and Neuropsychiatric Assessment
DoD-44	Investigation of Seminal Plasma Hypersensitivity Reactions
DoD-45	Physical and Emotional Health of Gulf War Veterans Women
DoD-46	Exploratory Data Analysis with the CCEP Database
DoD-47	Study of Mycoplasmal Infections in Gulf War Veterans
DoD-48	Assessment of Genomic Instability via Chromosome 7 Inversion Frequency in a Gulf-War Syndrome Cohort vs Selected Control Groups
DoD-49	Diagnosis and Dosemetry of Exposure to Sulfur Mustard: Development of Standard Operating Procedures and Exploratory Research on Protein Adducts
DoD-50	Toxicokinetics of O-Ethyl S-(2-Diisopropylaminoethyl) Methylphosphonothioate [(+)-VX] in Rats, Hairless Guinea Pigs and Marmosets - Identification of Metabolic Pathways
DoD-51	Transgenic Engineering of Cholinesterases: Tools for Exploring Cholinergic Responses
DoD-52	Female Gender and Other Potential Predictors of Functional Health Status Among Persian Gulf War Veterans
DoD-53	Long-Term Effects of Subclinical Exposures to Sarin
DoD-54	Assessment of Subchronic Neurobehavioral and Neuropathologic Effects in Rats Following Low-Level Sarin Exposure
DoD-55	Low-Level Exposure to GB Vapor in Air: Diagnosis/Dosimetry, Lowest Observable Effect Levels, Performance-Incapacitation, and Possible Delayed Effects
DoD-56	Low-Level Sarin Neurotoxicity and Its Modulation by Pyridostigmine
DoD-57	Physiologic Effects of Stress in Gulf War Veterans

DoD-58	Illness Among Persian Gulf War Veterans: Case Validation Studies
DoD-59	Pyridostigmine-induced Neurodegeneration: Role of neuronal Apoptosis
DoD-60	Butyrylcholinesterase Genetic Variants in Persons with Gulf War Illness
DoD-61	Neurophysiologic and Neuropathologic Effects in Monkeys of Low Level Exposures to Sarin, Pyridostigmine, Pesticides, and Botulinum Toxoid
DoD-62	Sarin and Pyridostigmine Interaction under Physical Stress: Neurotoxic Effects in Mice
DoD-63	PGW Veterans: Epidemiological and Clinical Evidence for Residual Organophosphate Neurotoxicity
DoD-64	Individual Differences in Neurobehavioral Effects of Pyridostigmine
DoD-65	Multi-disciplinary Pathophysiologic Studies of Neurotoxic Gulf War Related Syndromes Leading to Diagnosis and Treatment
DoD-66	Testing for mycoplasmal infection replicability of nucleoprotein gene tracking and forensic polymerase chain reaction
DoD-67	Antibacterial Treatment Method Based Upon the Excretion of Dead and Decaying Spherical Bacteria
DoD-69	Five Year Follow-Up of Army Personnel Exposed to Chemical Warfare Agents
DoD-70	War Syndromes from 1900 to the Present: Symptom Patterns and Long-term Health Outcomes
DoD-71	A Comparison of Post Deployment Hospitalization Between Vietnam and Gulf War Veterans
DoD-72	Long-term Effects of Subchronic Exposure to Sarin, Alone and with Stress or Other Chemicals
DoD-73	Post-deployment Morbid Stress, Behavior and Health: Developing a Model for Predicting Morbidity, Mortality, and other Adverse Outcomes
DoD-74	Relationship of Stress Exposures to Health in Gulf War Veterans
DoD-75	Toxic Interactions of Prophylactic Drugs and Pesticides
DoD-76	Evaluations of Immunotoxicity due to Concurrent Exposure to DEET, Pyridostigmine, and JP-8 Jet Fuel
DoD-77	Percutaneous Absorption of Chemical Mixtures Relevant to the Gulf War

DoD-78	Experimental Models of Gulf War Syndrome
DoD-79	Time Course of Stress-induced Impairment of Blood Brain Barrier
DoD-80	Molecular Regulation of Corticosteroid Receptor Expression in Stress-Responsive Cells
DoD-81	Immunotoxicity due to Coexposure to DEET, Pyridostigmine, and Stress
DoD-82	Feasibility of Developing a Registry of PTSD Affected Veteran Sib Pairs
DoD-83	Risk for Stress-related Substance Abuse: the Effects of Family History of Alcoholism
DoD-84	Psychobiologic Alterations in Persian Gulf War Veterans with and without PTSD
DoD-85	CNS Cytokines and CRH in Gulf War Veterans with Multiple Unexplained Symptoms
DoD-86	Effects of Combat Stress on Structure and Function of the Hippocampus
DoD-87	Measurement and Validation of Psychosocial Risk and Resilience Factors Accounting for Physical and Mental Health and Health-Related Quality of Life among PGWVs
DoD-88	Clinical Relevance of Novel Immunological Markers in PTSD
DoD-89	Limbic Blood Flow and Opiate Receptor PET in Posttraumatic Stress Disorder
DoD-90	SPECT Benzodiazepine Receptor and MR Imaging in PTSD
DoD-91	Neurological and Circadian Substrates of PTSD-like Behaviors
DoD-92	Traumatic Experiences Persistently Enhance Cue-dependent Learning: Toward an Animal Model of Chronic Stress and Posttraumatic Stress Disorder
DoD-93	Troops Exposed to Nerve Agents at Aberdeen Proving Ground: Follow-Up
DoD-94	Combined Analysis of the VA and DoD Gulf War Clinical Registries: A Study of Clinical Findings from Systematic Medical Examinations of 100,000 U.S. Gulf War Veterans
DoD-95	Development of Diagnostic tools and alternative treatment drugs for Leishmania
DoD-96	Deployment Health Center

DoD-97	Surveillance of B. pertussis among Military Trainees with Respiratory Disease: Development and Validation of a Highly Sensitive PCR and Beacon Probe based Method for Diagnosis of Pertussis
DoD-98	Investigation of a Baseline Medical Database to Evaluate the Health of Military Forces and Veterans
DoD-99	DoD-wide Medical Surveillance for Potential Long-Term Adverse Events associated with Anthrax Immunization in Active Duty Service Members, Proposal 1: Hospitalizations
DoD-100	Antibodies to Squalene
DoD-101	Mechanisms in Chronic Multisymptom Illnesses
DoD-102	Case-Control Study of Fatal Motor Vehicle Crashes Among Gulf War Veterans
DoD-103	Human Metabolism and Interactions of Deployment-related Chemicals
DoD-104	Clinical Evaluation of a Proposed New Gulf War Syndrome
DoD-105	Neuroplasticity and Calcium Signaling in Stressed Rat Amygdala
DoD-106	The Role of Th1/Th2 cytokine balance in Gulf War-related illness
DoD-107	Stress, Organophosphates and Blood Brain Barrier Integrity
DoD-108	Health Status of Current National Guard Members
DoD-109	Disordered Responses to Orthostatic Stress in the Pathogenesis of Gulf War Syndrome Symptoms
DoD-110	Predictors of Career and Family Dysfunction in Young Adults Enlisting in the United States Navy
DoD-111	Autonomic Dysfunction in Gulf War Veterans
DoD-112	Role of Respirable Saudi Arabian Sand and Pyridostigmine in the Gulf War Syndrome: An Autoimmune Adjuvant Disease?
DoD-113	Interactions of Subsymptomatic Doses of Sarin with Pyridostigmine: Neurochemical, Behavioral, and Physiological Effects
DoD-114	A Re-examination of Neuropsychological Functioning in Persian Gulf War Veterans
DoD-115	A Randomized, Multi-Center, Controlled Trial of Multi-Model Therapy in Veterans with Gulf War Illnesses (EBT) (See also VA-62; formerly VA/DoD 1D)

DoD-116	VA/DoD Core Funding of the Medical Follow-Up Agency (See also VA-63; formerly VA-DoD-2D/2V)
DoD-116A	Follow-Up Investigation of Troops Exposed to Nerve Agents at Aberdeen Proving Ground (Pilot Study) (See also VA-63A; formerly VA/DoD-2DA)
DoD-116B	Patterns of Pre-Persian Gulf War Illness and Health Care Seeking, Pilot Study (See also VA-63B; formerly VA/DoD- 2DB)
DoD-117	Patterns of Pre-Persian Gulf War Illness and Health Care Seeking
DoD-118	An Epidemiological Investigation into the Occurrence of Amyotrophic Lateral Sclerosis (ALS) Among Gulf War Veterans (See also VA-61)
DoD-119	Antibiotic Treatment of Gulf War Veterans' Illnesses (ABT)
DoD-120	Assessing the Potential Health Impact of the Gulf War on Saudi Arabia National Guard Members and Their Dependents
DoD-121	Evaluation of the Health Risks of Embedded Depleted Uranium Shrapnel of Pregnancy and Offspring Development
DoD-122	Carcinogenic Potential of Depleted Uranium and Tungsten Alloys
DoD-123	Immunotoxicity of Depleted Uranium and Heavy Metal Tungsten Alloys
DoD-124	Randomized, Controlled Trial for Combination Treatment with Pyridostigmine, DEET, and Permethrin

#### **DEPARTMENT OF HEALTH AND HUMAN SERVICES**

HHS-1	Health Assessment of Persian Gulf War Veterans from Iowa
HHS-2	Disease Cluster in a Pennsylvania Air National Guard Unit, EPI-AID 95-18
HHS-3	Biomarkers of Susceptibility and Polycyclic Aromatic Hydrocarbon (PAH) Exposure in Urine and blood Cell DNA from U.S. Army Soldiers Exposed to Kuwaiti Oil Well Fires
HHS-4	Suspected Increase of Birth Defects and Health Problems Among Children Born to Persian Gulf War Veterans In Mississippi
HHS-5	Cognitive Function and Symptom Patterns in Persian Gulf Veterans
HHS-6	Defining Gulf War Illness

- HHS-7      Immunotoxicity of Dermal Permethrin and Cis-Urocanic Acid
- HHS-8      Strategy to Identify Non-Additive Response to Chemical Mixtures

**DEPARTMENT OF VETERANS AFFAIRS**

- VA-1      Mortality Follow-up Study of Persian Gulf Veterans
- VA-2      National Health Survey of Persian Gulf Veterans
- VA-2A      VA National Survey of Persian Gulf Veterans - Phase I
- VA-2B      VA National Survey of Persian Gulf Veterans - Phase II
- VA-2C      VA National Survey of Persian Gulf Veterans - Phase III
- VA-3      Use of Roster of Veterans Who Served in Persian Gulf Area
- VA-4Core      Boston Environmental Hazards Research Center Program
- VA-4      Boston Environmental Hazards Research Center Program
- VA-4A      Evaluation of Cognitive Functioning of Persian Gulf Veterans
- VA-4B      Evaluation of Neurological Functioning in Persian Gulf Veterans
- VA-4C      Gulf War And Vietnam Veterans Cancer Incidence Surveillance
- VA-4D      Evaluation of Respiratory Dysfunction Among Gulf War Veterans
- VA-4E      The Aromatic Hydrocarbon Receptor (AhR) as a Biomarker of Susceptibility
- VA-4F      Validity of Computerized Tests
- VA-5Core      East Orange Environmental Hazards Research Center Program
- VA-5      East Orange Environmental Hazards Research Center Program
- VA-5A      Health and Exposure Survey of Persian Gulf Veterans

VA-5B	Physiological and Psychological Assessments of Persian Gulf Veterans
VA-5C	Effects of Exertion and Chemical Stress on Persian Gulf Veterans
VA-5D	Effects of Genetics and Stress on Responses to Environmental Toxins
VA-6Core	Core Program: Portland Environmental Hazards Research Center: Environment, Veterans Health and the Gulf War Syndrome. Core Project for Clinical and Epidemiology Research
VA-6	Portland Environmental Hazards Research Center: Environment, Veterans' Gulf War Syndrome. Core: Clinical and Epidemiology Research
VA-6A	Psychosocial, Neuropsychological and Neurobehavioral Assessment (Project I)
VA-6B	Clinical and Neuroendocrine Aspects of Fibromyalgia (Project II)
VA-6C	Neurotoxicity of Environmental Pollutants and Warfare Agents (Project III)
VA-6D	DNA Damage from Chemical Agents and Its Repair (Project IV)
VA-6E	Clinical and Epidemiology Leishmania Research
VA-7	Desert Storm Reunion Survey
VA-8	Psychological Test Data of Gulf War Veterans Over Time
VA-9	Evaluation of Cognitive Functioning in Persian Gulf War Veterans Reporting War-related Health Problems
VA-10	Memory and Attention in PTSD
VA-11	Neuropsychological Functioning in Veterans
VA-12	Psychological Assessment of Operation Desert Storm Returnees
VA-13	Neurobehavioral Aspects of Persian Gulf Experiences: A Pilot Study
VA-15	Vaccine-Mediated Immunity Against Leishmaniasis
VA-16	Protective Immunity in Experimental Visceral Leishmaniasis
VA-17	Immunological Evaluation of Persian Gulf Veterans

VA-18	Chronic Gastrointestinal Illness in Persian Gulf Veterans
VA-20	Psychological Adjustment in Operation Desert Shield/Storm Veterans
VA-21	A Comparison of PTSD Symptomatology among Three Army Medical Units Involved in ODS
VA-36	Stress Symptoms and Their Causal Attribution in Desert Storm Veterans
VA-40	Musculoskeletal Symptoms in Gulf War Syndrome
VA-46	Diarrhea in Persian Gulf Veterans: An Irritable Bowel-Like Disorder
VA-47	Retrospective Verification of Mustard Gas Exposure
VA-48	Cross-Sensitization as a CNS Model for Gulf War Chemical Intolerance
VA-49	Sensitivity to Pyridostigmine Bromide: Persistent Neural Dysfunction
VA-50	Neuropsychological findings in a sample of Operation Desert Storm veterans
VA-51	Psychobiological Assessment of Desert Storm Veterans
VA-53	Spouses and Children Program
VA-54	Follow-up of Psychological and Neurocognitive Gulf War Outcome: Relation to Stress
VA-55	Antibiotic Treatment of Gulf War Veterans' Illnesses (ABT)
VA-56	Birmingham's Gulf War Veterans' Illness Demonstration Clinic (13)
VA-57	Case Management and Residential Rehabilitation for Persian Gulf War Veterans (13)
VA-58	Implementation and Evaluation of Gulf War Veterans' Demonstration Project (13)
VA-59	Demonstration Treatment Program for Gulf War Veterans With Unexplained Physical Symptoms (13)
VA-60	Identification and Management of Sleep Disorders in Gulf War Veterans
VA-61	An Epidemiological Investigation into the Occurrence of Amyotrophic Lateral Sclerosis (ALS) Among Gulf War Veterans (See also DoD-118)

VA-62	A Randomized, Multi-Center, Controlled Trial of Multi-Model Therapy in Veterans with Gulf War Illness (EBT) (See also DoD-115; formerly VA/DoD 1V)
VA-63	VA/DoD Core funding of the Medical Follow-Up Agency (See also DoD-116; formerly VA/DoD-2V/2D)
VA-63A	Follow-Up Investigation of troops exposed to nerve agents at Aberdeen Proving Ground (Pilot Study) (See also DoD-116A; formerly VA/DoD-2VA/2DA)
VA-63B	Patterns of Pre-Persian Gulf War Illness and Health Care Seeking Pilot Study (See also DoD-116B; previously VA/DoD-2VB)
VA-64	Boston Environmental Hazards Research Center
VA-64A	Functional Neuroimaging in Lead Exposed Adults
VA-64B	Quantification and Validation of Structure-Function relationships through visuospatial test performance
VA-64C	Development of a structured neurotoxicant assessment checklist (SNAC) for clinical use in veteran populations
VA-65	San Antonio Environmental Hazards Research Center
VA-65A	Does a variant of the human SOD2 gene increase sensitivity to hazards?
VA-65B	The contribution of FEN-1 to genetic integrity subsequent to oxidative stress
VA-65C	The importance of hydrogen peroxide detoxification in cellular protection
VA-65D	Do defective Gpx1 and ALDH2 genes increase sensitivity to environmental exposure
VA-66	Physiological Responding in Posttraumatic Stress Disorder
VA-67	Olfactory Functioning in Gulf War Veterans
VA-68	Family Study of Fibromyalgia
VA-69	Cardiovascular Hyporeactivity and Fatiguing Illness in Gulf War Veterans
VA-70	A Clinical Evaluation of the Health Status of Persian Gulf War Veterans in VISN 8
VA-71	Central Nervous System Modulation of Visceral Pain in the Persian Gulf Syndrome



# **Appendix A 2**

## **Project List by Research Focus Areas**

## Major Focus Area

<i>Research Type</i>	<b>Secondary Focus Area</b>	<b>Tertiary Focus Area</b>	<b>Project Number</b>	<b>Project Title</b>
<b>Brain &amp; Nervous System</b>				
<i>Clinical Research</i>	Symptoms/General Health	Diagnosis	DoD-67	Antibacterial Treatment Method Based Upon the Excretion of Dead and Decaying Spherical Bacteria
<i>Clinical Research</i>	Chemical Weapons		DoD-63	PGW Veterans: Epidemiological and Clinical Evidence for Residual Organophosphate Neurotoxicity
<i>Mechanistic</i>			DoD-80	Molecular Regulation of Corticosteroid Receptor Expression in Stress-Responsive Cells
<i>Clinical Research</i>	Symptoms/General Health		DoD-89	Limbic Blood Flow and Opiate Receptor PET in Posttraumatic Stress Disorder
<i>Clinical Research</i>			VA-67	Olfactory Functioning in Gulf War Veterans
<i>Clinical Research</i>	Symptoms/General Health	Diagnosis	DoD-31	Dysregulation of the Stress Response in the Persian Gulf Syndrome
<i>Clinical Research</i>	Diagnosis		DoD-32	Neuropsychological Functioning in Persian Gulf Era Veterans
<i>Epidemiology Research</i>	Prevention		DoD-87	Measurement and Validation of Psychosocial Risk and Resilience Factors Accounting for Physical and Mental Health and Health-Related Quality of Life
<i>Clinical Research</i>			VA-71	Central Nervous System Modulation of Visceral Pain in the Persian Gulf Syndrome
<i>Clinical Research</i>	Symptoms/General Health		DoD-36	Fatigue in Persian Gulf Syndrome-Physiologic Mechanisms
<i>Clinical Research</i>	Symptoms/General Health		VA-9	Evaluation of Cognitive Functioning in Persian Gulf War Veterans Reporting War-related Health Problems
<i>Clinical Research</i>	Symptoms/General Health		DoD-40	Psychological and Neurobiological Consequences of the Gulf War Experience

## Brain & Nervous System (continued)

<i>Clinical Research</i>	Treatment		DoD-90	SPECT Benzodiazepine Receptor and MR Imaging in PTSD
<i>Clinical Research</i>	Symptoms/General Health		DoD-41	Evaluation of Muscle Function in Persian Gulf Veterans
<i>Clinical Research</i>			VA-50	Neuropsychological findings in a sample of Operation Desert Storm veterans
<i>Clinical Research</i>	Symptoms/General Health		VA-51	Psychobiological Assessment of Desert Storm Veterans
<i>Clinical Research</i>	Treatment	Symptoms/General Health	DoD-85	CNS Cytokines and CRH in Gulf War Veterans with Multiple Unexplained Symptoms
<i>Clinical Research</i>	Symptoms/General Health		DoD-84	Psychobiologic Alterations in Persian Gulf War Veterans with and without PTSD
<i>Epidemiology Research</i>			VA-36	Stress Symptoms and Their Causal Attribution in Desert Storm
<i>Epidemiology Research</i>	Symptoms/General Health		DoD-52	Female Gender and Other Potential Predictors of Functional Health Status Among Persian Gulf War Veterans
<i>Clinical Research</i>	Prevention		DoD-83	Risk for Stress-related Substance Abuse: the Effects of Family History of Alcoholism
<i>Epidemiology Research</i>			DoD-82	Feasibility of Developing a Registry of PTSD Affected Veteran
<i>Clinical Research</i>			VA-20	Psychological Adjustment in Operation Desert Shield/Storm Veterans
<i>Clinical Research</i>			DoD-86	Effects of Combat Stress on Structure and Function of the Hippocampus
<i>Clinical Research</i>	Symptoms/General Health		VA-11	Neuropsychological Functioning in Veterans
<i>Clinical Research</i>			VA-13	Neurobehavioral Aspects of Persian Gulf Experiences: A Pilot

## Brain & Nervous System (continued)

<i>Clinical Research</i>		VA-21	A Comparison of PTSD Symptomatology among Three Army Medical Units Involved in	
<i>Clinical Research</i>	Symptoms/General Health	HHS-5	Cognitive Function and Symptom Patterns in Persian Gulf Veterans	
<i>Clinical Research</i>	Symptoms/General Health	VA-6A	Psychosocial, Neuropsychological and Neurobehavioral Assessment (Project I)	
<i>Clinical Research</i>	Diagnosis	VA-4F	Validity of Computerized Tests	
<i>Clinical Research</i>		VA-69	Cardiovascular Hyporeactivity and Fatiguing Illness in Gulf War Veterans	
<i>Clinical Research</i>	Symptoms/General Health	VA-10	Memory and Attention in PTSD	
<i>Mechanistic</i>		DoD-91	Neurological and Circadian Substrates of PTSD-like Behaviors	
<i>Clinical Research</i>	Symptoms/General Health	VA-4B	Evaluation of Neurological Functioning in Persian Gulf	
<i>Clinical Research</i>	Symptoms/General Health	VA-4A	Evaluation of Cognitive Functioning of Persian Gulf Veterans	
<i>Clinical Research</i>		VA-12	Psychological Assessment of Operation Desert Storm Returnees	
<i>Mechanistic</i>		DoD-92	Traumatic Experiences Persistently Enhance Cue-dependent Learning: Toward an Animal Model of Chronic Stress and Posttraumatic Stress Disorder	
<i>Epidemiology Research</i>	Symptoms/General Health	DoD-23	Acute and Long-Term Impact of Deployment to Southwest Asia on the Physical and Mental Health of Soldiers and their Families	
<i>Clinical Research</i>	Symptoms/General Health	VA-54	Follow-up of Psychological and Neurocognitive Gulf War Outcome: Relation to Stress	
<i>Clinical Research</i>	Symptoms/General Health	Environmental Toxicology	VA-5C	Effects of Exertion and Chemical Stress on Persian Gulf Veterans

## Brain & Nervous System (continued)

<i>Epidemiology Research</i>	Symptoms/General Health	VA-68	Family Study of Fibromyalgia
<i>Clinical Research</i>	Symptoms/General Health	VA-7	Desert Storm Reunion Survey
<i>Clinical Research</i>		VA-66	Physiological Responding in Posttraumatic Stress Disorder
<i>Epidemiology Research</i>		DoD-118	An Epidemiological Investigation into the Occurrence of Amyotrophic Lateral Sclerosis (ALS) Among Gulf War Veterans (See also
<i>Epidemiology Research</i>		VA-61	An Epidemiological Investigation into the Occurrence of Amyotrophic Lateral Sclerosis (ALS) Among Gulf War Veterans (See also
<i>Clinical Research</i>		VA-64	Boston Environmental Hazards Research Center
<i>Clinical Research</i>		DoD-101	Mechanisms in Chronic Multisymptom Illnesses
<i>Epidemiology Research</i>		DoD-114	A Re-examination of Neuropsychological Functioning in Persian Gulf War Veterans
<i>Clinical Research</i>	Environmental Toxicology	VA-64A	Functional Neuroimaging in Lead Exposed Adults
<i>Clinical Research</i>		DoD-111	Autonomic Dysfunction in Gulf War Veterans
<i>Mechanistic Research</i>		DoD-105	Neuroplasticity and Calcium Signaling in Stressed Rat Amygdala
<i>Clinical Research</i>		VA-64B	Quantification and Validation of Structure-Function relationships through visuospatial test performance

## Chemical Weapons

<i>Clinical Research</i>	Diagnosis	VA-47	Retrospective Verification of Mustard Gas Exposure
<i>Development</i>	Diagnosis	DoD-49	Diagnosis and Dosemetry of Exposure to Sulfur Mustard: Development of Standard Operating Procedures and Exploratory Research on Protein

## Chemical Weapons (continued)

<i>Mechanistic</i>			DoD-50	Toxicokinetics of O-Ethyl S-(2-Diisopropylaminoethyl) Methylphosphonothioate [(+)-VX] in Rats, Hairless Guinea Pigs and Marmosets - Identification of Metabolic Pathways
<i>Mechanistic</i>	Prevention		DoD-51	Transgenic Engineering of Cholinesterases: Tools for Exploring Cholinergic Responses
<i>Mechanistic</i>	Diagnosis		VA-6D	DNA Damage from Chemical Agents and Its Repair (Project IV)
<i>Mechanistic</i>	Brain & Nervous System		DoD-53	Long-Term Effects of Subclinical Exposures to Sarin
<i>Epidemiology Research</i>	Symptoms and General Health		DoD-93	Troops Exposed to Nerve Agents at Aberdeen Proving Ground: Follow-Up
<i>Clinical Research</i>	Pyridostigmine Bromide	Prevention	DoD-60	Butyrylcholinesterase Genetic Variants in Persons with Gulf War Illness
<i>Epidemiology Research</i>			VA-63A	Follow-Up Investigation of troops exposed to nerve agents at Aberdeen Proving Ground (Pilot Study) (See also DoD-116A; formerly VA/DoD-2VA/2DA)
<i>Epidemiology Research</i>	Symptoms/General Health		DoD-69	Five Year Follow-Up of Army Personnel Exposed to Chemical Warfare Agents
<i>Epidemiology</i>			DoD-116A	Follow-Up Investigation of Troops Exposed to Nerve Agents at Aberdeen Proving Ground (Pilot Study) (See also VA-63A; formerly VA/DoD-2DA)
<i>Mechanistic</i>	Pyridostigmine Bromide	Brain and Nervous System	DoD-113	Interactions of Subsymptomatic Doses of Sarin with Pyridostigmine: Neurochemical, Behavioral, and Physiological Effects

## Depleted Uranium

<i>Mechanistic</i>	Environmental Toxicology		DoD-7B	Carcinogenicity of Depleted Uranium Fragments
<i>Mechanistic</i>	Immune Function		DoD-123	Immunotoxicity of Depleted Uranium and Heavy Metal
<i>Mechanistic</i>	Symptoms and General Health		DoD-122	Carcinogenic Potential of Depleted Uranium and Tungsten Alloys
<i>Mechanistic</i>	Reproductive Health		DoD-121	Evaluation of the Health Risks of Embedded Depleted Uranium Shrapnel of Pregnancy & Offspring Development

## Depleted Uranium (continued)

<i>Mechanistic</i>	Environmental Toxicology		DoD-7A	Health Risk Assessment of Embedded Depleted Uranium: Behavior, Physiology, Histology, and Biokinetic Modeling
<b>Development</b>				
<i>Development</i>			DoD-100	Antibodies to Squalene
<i>Clinical Research</i>			DoD-47	Study of Mycoplasmal Infections in Gulf War Veterans
<i>Development</i>			DoD-66	Testing for mycoplasmal infection replicability of nucleoprotein gene tracking and forensic polymerase chain reaction
<i>Development</i>			DoD-97	Surveillance of B. pertussis among Military Trainees with Respiratory Disease: Development and Validation of a Highly Sensitive PCR and Beacon Probe based Method for Diagnosis of Pertussis
<b>Enviromental Toxicology</b>				
<i>Mechanistic Research</i>			VA-65B	The contribution of FEN-1 to genetic integrity subsequent to oxidative stress
<i>Clinical Research</i>	Diagnosis		VA-64C	Development of a structured neurotoxicant assessment checklist (SNAC) for clinical use in veteran populations
<i>Mechanistic Research</i>			VA-65	San Antonio Environmental Hazards Research Center
<i>Mechanistic</i>	Brain & Nervous System	Chemical Weapons	DoD-22	Chronic Organophosphorus Exposure and Cognition
<i>Development</i>			DoD-19	Persian Gulf Veterans Health Tracking System
<i>Development</i>			DoD-16	Kuwait Oil Fire Health Risk Assessment
<i>Epidemiology Research</i>			DoD-13	Effects of Persian Gulf War Service on Military Working Dogs
<i>Clinical Research</i>	Symptoms/General Health		VA-4D	Evaluation of Respiratory Dysfunction Among Gulf War Veterans

## Enviromental Toxicology (continued)

<i>Mechanistic</i>	Prevention		VA-4E	The Aromatic Hydrocarbon Receptor (AhR) as a Biomarker of Susceptibility
<i>Mechanistic Research</i>			VA-65C	The importance of hydrogen peroxide detoxification in cellular protection
<i>Mechanistic Research</i>			VA-65D	Do defective Gpx1 and ALDH2 genes increase sensitivity to environmental exposure
<i>Development</i>			DoD-18	Kuwait Oil Fires Troop Exposure Assessment Model (TEAM)
<i>Mechanistic</i>	Prevention		HHS-3	Biomarkers of Susceptibility and Polycyclic Aromatic Hydrocarbon (PAH) Exposure in Urine and blood Cell DNA from U.S. Army Soldiers Exposed to Kuwaiti Oil Well Fires
<i>Mechanistic Research</i>			VA-65A	Does a variant of the human SOD2 gene increase sensitivity to hazards?
<i>Clinical Research</i>	Brain & Nervous System	Interactions	VA-48	Cross-Sensitization as a CNS Model for Gulf War Chemical
<i>Development</i>	Interactions		DoD-34	Characterization of Emissions from Heaters Burning Leaded Diesel Fuel in Unvented Tents

## Immune Function

<i>Clinical Research</i>			DoD-106	The Role of Th1/Th2 cytokine balance in Gulf War-related illness
<i>Mechanistic</i>	Pyridostigmine Bromide	Interactions	DoD-112	Role of Respirable Saudi Arabian Sand and Pyridostigmine in the Gulf War Syndrome: An Autoimmune Adjuvant Disease?
<i>Mechanistic</i>	Interactions	Environmental Toxicology	HHS-7	Immunotoxicity of Dermal Permethrin and Cis-Urocanic Acid
<i>Clinical Research</i>	Brain & Nervous System		DoD-88	Clinical Relevance of Novel Immunological Markers in PTSD
<i>Clinical Research</i>	Symptoms/General Health		VA-17	Immunological Evaluation of Persian Gulf Veterans
<i>Clinical Research</i>	Symptoms/General Health		VA-6B	Clinical and Neuroendocrine Aspects of Fibromyalgia (Project II) Veterans

## Immune Function (continued)

<i>Clinical Research</i>			DoD-48	Assessment of Genomic Instability via Chromosome 7 Inversion Frequency in a Gulf-War Syndrome Cohort vs Selected Control Groups
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## Interactions

<i>Mechanistic</i>	Pyridostigmine Bromide	Brain & Nervous System	DoD-2	Physiological and Neurobehavioral Effects in Rodents from Exposure to Pyridostigmine, Fuels, and DEET
<i>Mechanistic</i>	Pyridostigmine Bromide		DoD-77	Percutaneous Absorption of Chemical Mixtures Relevant to the Gulf War
<i>Development</i>	Environmental Toxicology		HHS-8	Strategy to Identify Non-Additive Response to Chemical Mixtures
<i>Mechanistic</i>	Brain & Nervous System	Chemical Weapons	DoD-54	Assessment of Subchronic Neurobehavioral and Neuropathologic Effects in Rats Following Low-Level Sarin Exposure
<i>Mechanistic</i>	Pyridostigmine Bromide	Immune Function	DoD-76	Evaluations of Immunotoxicity due to Concurrent Exposure to DEET, Pyridostigmine, and JP-8 Jet Fuel
<i>Mechanistic</i>	Chemical Weapons	Brain & Nervous System	DoD-78	Experimental Models of Gulf War Syndrome
<i>Mechanistic</i>	Pyridostigmine Bromide	Brain & Nervous System	DoD-75	Toxic Interactions of Prophylactic Drugs and Pesticides
<i>Mechanistic</i>	Chemical Weapons	Brain & Nervous System	DoD-72	Long-term Effects of Subchronic Exposure to Sarin, Alone and with Stress or Other Chemicals
<i>Mechanistic</i>	Chemical Weapons	Pyridostigmine Bromide	DoD-55	Low-Level Exposure to GB Vapor in Air: Diagnosis/Dosimetry, Lowest Observable Effect Levels, Performance-Incapacitation, and Possible Delayed Effects
<i>Mechanistic</i>	Immune Function	Pyridostigmine Bromide	DoD-81	Immunotoxicity due to Coexposure to DEET, Pyridostigmine, and
<i>Mechanistic</i>	Chemical Weapons	Pyridostigmine Bromide	DoD-61	Neurophysiologic and Neuropathologic Effects in Monkeys of Low Level Exposures to Sarin, Pyridostigmine, Pesticides, and Botulinum Toxoid
<i>Mechanistic</i>	Chemical Weapons	Pyridostigmine Bromide	DoD-56	Low-Level Sarin Neurotoxicity and Its Modulation by Pyridostigmine
<i>Mechanistic</i>	Pyridostigmine Bromide	Brain & Nervous System	DoD-37	Neurobehavioral and Immunological Toxicity of Pyridostigmine, Permethrin, and DEET in Male and Female Rats
<i>Mechanistic Research</i>	Environmental Toxicology		DoD-103	Human Metabolism and Interactions of Deployment-related Chemicals

## Interactions (continued)

<i>Mechanistic</i>	Chemical Weapons	Pyridostigmine Bromide	DoD-62	Sarin and Pyridostigmine Interaction under Physical Stress: Neurotoxic Effects in Mice
<b>Leishmaniasis</b>				
<i>Development</i>	Diagnosis	Treatment	DoD-95	Development of Diagnostic tools and alternative treatment drugs for Leishmania
<i>Development</i>			DoD-8	Program DoD-8
<i>Clinical Research</i>	Diagnosis	Treatment	VA-6E	Clinical and Epidemiology Leishmania Research
<i>Development</i>	Diagnosis		DoD-38	Diagnostic Antigens of Leishmania tropica
<i>Development</i>	Diagnosis		DoD-8A	Serologic Diagnosis of Viscerotropic Leishmaniasis (VTL)
<i>Development</i>	Diagnosis		DoD-8B	Development of a Leishmania Skin Test Antigen (LSTA)
<i>Mechanistic</i>	Prevention		VA-15	Vaccine-Mediated Immunity Against Leishmaniasis
<i>Mechanistic</i>	Prevention		VA-16	Protective Immunity in Experimental Visceral
<i>Mechanistic</i>	Treatment		DoD-9	Identification of the Genetic Factors Which Control Tropism in Leishmania
<b>Mortality</b>				
<i>Epidemiology Research</i>			VA-1	Mortality Follow-up Study of Persian Gulf Veterans
<i>Epidemiology Research</i>	Prevention		DoD-102	Case-Control Study of Fatal Motor Vehicle Crashes Among Gulf War Veterans
<i>Epidemiology Research</i>			DoD-15	Comparative Mortality Among US Military Personnel Worldwide During Operations Desert Shield and Desert Storm
<b>Prevention</b>				
<i>Epidemiology</i>			DoD-110	Predictors of Career and Family Dysfunction in Young Adults Enlisting in the United States Navy
<b>Pyridostigmine Bromide</b>				
<i>Mechanistic</i>	Brain & Nervous System		DoD-79	Time Course of Stress-induced Impairment of Blood Brain Barrier

## Pyridostigmine Bromide (continued)

<i>Mechanistic Research</i>	Brain and Nervous System		DoD-107	Stress, Organophosphates and Blood Brain Barrier Integrity
<i>Mechanistic</i>	Prevention		DoD-33	Effects of Pyridostigmine in Flinders Line Rats Differing in Cholinergic Sensitivity
<i>Mechanistic</i>	Interactions		DoD-10	Pyridostigmine Synergistic Toxicity Study
<i>Epidemiology Research</i>			DoD-17	Retrospective Studies Involving Military Use of Pyridostigmine as a Pretreatment for Nerve Agent Poisoning
<i>Clinical Research</i>			DoD-11	Male/Female Differential Tolerances to Pyridostigmine
<i>Epidemiology Research</i>	Prevention		DoD-21	Study of Variability In Pyridostigmine Inhibition of Blood Cholinesterases in Healthy Adults and Individuals With Symptoms Following Participation in Operation Desert Storm
<i>Clinical Research</i>	Interactions		DoD-124	Randomized, Controlled Trial for Combination Treatment with Pyridostigmine, DEET, and Permethrin
<i>Mechanistic</i>	Brain & Nervous System		VA-49	Sensitivity to Pyridostigmine Bromide: Persistent Neural Dysfunction
<i>Mechanistic</i>	Interactions		VA-5D	Effects of Genetics and Stress on Responses to Environmental
<i>Clinical Research</i>	Brain & Nervous System	Prevention	DoD-64	Individual Differences in Neurobehavioral Effects of Pyridostigmine
<i>Mechanistic</i>	Brain & Nervous System		DoD-59	Pyridostigmine-induced Neurodegeneration: Role of neuronal Apoptosis
<i>Mechanistic</i>	Environmental Toxicology		VA-6C	Neurotoxicity of Environmental Pollutants and Warfare Agents (Project III)

## Reproductive Health

<i>Clinical Research</i>	Symptoms/General Health	Immunology	DoD-44	Investigation of Seminal Plasma Hypersensitivity Reactions
<i>Epidemiology Research</i>			DoD-35	Feasibility of Investigating Whether There is a Relationship Between Birth Defects and Service in the Gulf War

## Reproductive Health (continued)

<i>Clinical Research</i>			VA-53	Spouses and Children Program
<i>Epidemiology Research</i>			HHS-4	Suspected Increase of Birth Defects and Health Problems Among Children Born to Persian Gulf War Veterans In Mississippi
<i>Epidemiology Research</i>			DoD-1G	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 7: Prevalence of Congenital Anomalies Among Children of Persian Gulf War Veterans
<i>Epidemiology Research</i>			DoD-1D	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 4: Infertility and Miscarriage in Gulf War
<i>Epidemiology Research</i>			DoD-1C	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 3: A comparative study of pregnancy outcomes among Gulf War veterans and other active-duty

## Symptoms & General Health

<i>Epidemiology Research</i>			VA-70	A Clinical Evaluation of the Health Status of Persian Gulf War Veterans in VISN 8
<i>Epidemiology</i>			DoD-104	Clinical Evaluation of a Proposed New Gulf War Syndrome
<i>Epidemiology Research</i>			DoD-98	Investigation of a Baseline Medical Database to Evaluate the Health of Military Forces and Veterans
<i>Epidemiology Research</i>			DoD-99	DoD-wide Medical Surveillance for Potential Long-Term Adverse Events associated with Anthrax Immunization in Active Duty Service Members, Proposal 1: Hospitalizations
<i>Epidemiology Research</i>	Prevention		DoD-108	Health Status of Current National Guard Members
<i>Epidemiology Research</i>	Reproductive Health	Treatment	DoD-96	Deployment Health Center
<i>Clinical Research</i>	Diagnosis		DoD-109	Disordered Responses to Orthostatic Stress in the Pathogenesis of Gulf War Syndrome Symptoms

## Symptoms & General Health (continued)

<i>Epidemiology Research</i>		VA-2B	VA National Survey of Persian Gulf Veterans - Phase II
<i>Clinical Research</i>		VA-4	Boston Environmental Hazards Research Center Program
<i>Epidemiology Research</i>	Chemical Weapons	VA-63	VA/DoD Core funding of the Medical Follow-Up Agency (See also DoD-116; formerly
<i>Clinical Research</i>		VA-5	East Orange Environmental Hazards Research Center Program
<i>Clinical Research</i>		VA-6	Portland Environmental Hazards Research Center: Environment, Veterans' Gulf War Syndrome. Core: Clinical and Epidemiology Research
<i>Epidemiology Research</i>		VA-63B	Patterns of Pre-Persian Gulf War Illness and Health Care Seeking Pilot Study (See also DoD-116B; previously VA/DoD-2VB)
<i>Epidemiology Research</i>		VA-2A	VA National Survey of Persian Gulf Veterans - Phase I
<i>Epidemiology Research</i>		VA-4C	Gulf War And Vietnam Veterans Cancer Incidence Surveillance
<i>Epidemiologic Research</i>		DoD-120	Assessing the Potential Health Impact of the Gulf War on Saudi Arabia National Guard Members and Their Dependents
<i>Clinical Research</i>	Brain & Nervous System	VA-5B	Physiological and Psychological Assessments of Persian Gulf veterans
<i>Epidemiological Research</i>		HHS-6	Defining Gulf War Illness
<i>Epidemiology Research</i>	Prevention	DoD-117	Patterns of Pre-Persian Gulf War Illness and Health Care Seeking
<i>Epidemiology Research</i>		DoD-116B	Patterns of Pre-Persian Gulf War Illness and Health Care Seeking, Pilot Study (See also VA-63B; formerly VA/DoD- 2DB)
<i>Clinical Research</i>	Brain & Nervous System	DoD-58	Illness Among Persian Gulf War Veterans: Case Validation Studies

## Symptoms & General Health (continued)

<i>Clinical Research</i>			DoD-1A	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; A Study of Symptoms Among 1500 Seabees
<i>Epidemiology Research</i>	Chemical Weapons		DoD-116	VA/DoD Core Funding of the Medical Follow-Up Agency (See also VA-63)
<i>Clinical Research</i>	Brain & Nervous System		VA-4Core	Boston Environmental Hazards Research Center Program
<i>Clinical Research</i>	Brain & Nervous System		DoD-57	Physiologic Effects of Stress in Gulf War Veterans
<i>Epidemiology Research</i>	Brain & Nervous System	Diagnosis	VA-2C	VA National Survey of Persian Gulf Veterans - Phase III
<i>Epidemiology Research</i>			DoD-4	The General well-being of Gulf War Era Service Personnel from the States of Pennsylvania and Hawaii: A Survey
<i>Clinical Research</i>	Brain & Nervous System		VA-8	Psychological Test Data of Gulf War Veterans Over Time
<i>Epidemiology Research</i>			VA-6Core	Core Program: Portland Environmental Hazards Research Center: Environment, Veterans Health and the Gulf War Syndrome. Core Project for Clinical and Epidemiology Research
<i>Epidemiology Research</i>			HHS-1	Health Assessment of Persian Gulf War Veterans from Iowa
<i>Epidemiology Research</i>			VA-5A	Health and Exposure Survey of Persian Gulf Veterans
<i>Epidemiology Research</i>			DoD-1B	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 2: A Comparative Study of Hospitalizations among Active-Duty Personnel Who Participated in the Gulf War and Similar Personnel Who Did Not
<i>Clinical Research</i>			VA-18	Chronic Gastrointestinal Illness in Persian Gulf Veterans

## Symptoms & General Health (continued)

<i>Epidemiology Research</i>			DoD-1E	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 5: Seabee Health Study
<i>Epidemiology Research</i>			DoD-1F	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 6: A Comparison of Nonfederal Hospitalization Experience Among Veterans in California who have separated from active service: PGW vs. EV
<i>Epidemiology Research</i>			DoD-73	Post-deployment Morbid Stress, Behavior and Health: Developing a Model for Predicting Morbidity, Mortality, and other Adverse Outcomes
<i>Clinical Research</i>	Brain & Nervous System		VA-5Core	East Orange Environmental Hazards Research Center Program
<i>Epidemiology Research</i>			DoD-70	War Syndromes from 1900 to the Present: Symptom Patterns and Long-term Health Outcomes
<i>Epidemiology Research</i>			VA-3	Use of Roster of Veterans Who Served in Persian Gulf Area
<i>Epidemiology Research</i>	Diagnosis		HHS-2	Disease Cluster in a Pennsylvania Air National Guard Unit, EPI-AID 95-18
<i>Clinical Research</i>	Immunology	Brain & Nervous System	DoD-42	The Symptomatic Persian Gulf Veterans Protocol: An Analysis of Risk Factors with an Immunologic and Neuropsychiatric Assessment
<i>Epidemiology Research</i>			DoD-71	A Comparison of Post Deployment Hospitalization Between Vietnam and Gulf War Veterans
<i>Epidemiology Research</i>			DoD-14	Risk Factors Among US Army Soldiers for Enrolling on the Department of Veterans Affairs Gulf War Registry
<i>Epidemiology Research</i>			DoD-74	Relationship of Stress Exposures to Health in Gulf War Veterans
<i>Epidemiology Research</i>			VA-2	National Health Survey of Persian Gulf Veterans

## Symptoms & General Health (continued)

<i>Epidemiology Research</i>			DoD-94	Combined Analysis of the VA and DoD Gulf War Clinical Registries: A Study of Clinical Findings from Systematic Medical Examinations of 100,000 U.S. Gulf War Veterans
<i>Epidemiology Research</i>	Reproductive Health		DoD-30	Epidemiological Studies Persian Gulf War Illnesses, PG Women's Health Linkage Study
<i>Epidemiology Research</i>			DoD-46	Exploratory Data Analysis with the CCEP Database
<i>Epidemiology Research</i>			VA-46	Diarrhea in Persian Gulf Veterans: An Irritable Bowel-Like Disorder
<i>Clinical Research</i>			VA-40	Musculoskeletal Symptoms in Gulf War Syndrome
<i>Clinical Research</i>	Brain & Nervous System	Reproductive Health	DoD-45	Physical and Emotional Health of Gulf War Veterans Women
<i>Epidemiology Research</i>			DoD-39	A Controlled Epidemiological and Clinical Study into the Effect of Gulf War Service on Servicemen and Women of the United Kingdom Armed Forces

## Treatment

<i>Clinical Research</i>	Symptoms/General Health		DoD-115	A Randomized, Multi-Center, Controlled Trial of Multi-Model Therapy in Veterans with Gulf War Illnesses (EBT) (See also VA-62; formerly VA/DoD 1D)
<i>Clinical Research</i>	Symptoms/General Health		VA-62	A Randomized, Multi-Center, Controlled Trial of Multi-Model Therapy in Veterans with Gulf War Illness (EBT) (See also DoD-115; formerly VA/DoD 1V)
<i>Clinical Research</i>			VA-56	Birmingham's Gulf War Veterans' Illness Demonstration Clinic (13)
<i>Clinical Research</i>	General Health		VA-55	Antibiotic Treatment of Gulf War Veterans' Illnesses (ABT)
<i>Clinical Research</i>			VA-58	Implementation and Evaluation of Gulf War Veterans' Demonstration Project (13)
<i>Clinical Research</i>	Brain and Nervous System		VA-59	Demonstration Treatment Program for Gulf War Veterans With Unexplained Physical Symptoms (13)

**Treatment (continued)**

<i>Clinical Research</i>	VA-60	Identification and Management of Sleep Disorders in Gulf War Veterans
<i>Clinical Research</i>	DoD-65	Multi-disciplinary Pathophysiologic Studies of Neurotoxic Gulf War Related Syndromes Leading to Diagnosis and Treatment
<i>Clinical Research</i>	DoD-119	Antibiotic Treatment of Gulf War Veterans' Illnesses (ABT)
<i>Clinical Research</i>	VA-57	Case Management and Residential Rehabilitation for Persian Gulf War Veterans (13)

# **Appendix A 3**

## **Project Budgets**

**(As of March 31, 2001)**

**NOTES ON REVISED TABLE OF SPENDING FOR  
GULF WAR VETERANS' ILLNESSES RESEARCH**

Research Working Group  
Military and Veterans Health Coordinating Board  
March 31, 2001

**NOTE:** These notes and the attached table replace and supercede Appendix A-3 of the *Annual Report to Congress: Federally Sponsored Research on Gulf War Veterans' Illness* for 1999.

**General**

1. All entries for research funding reflect money centrally committed to researchers (both intramural and extramural) to carry out the specific projects. These funds do not cover operational costs for administration, infrastructure, etc. Each department allocates these costs in slightly different ways making it difficult to accurately account for these funds. For example, in VA the research appropriation does not pay for clinician/investigator salaries. By law, those funds must come from the patient care appropriation.
2. A "blank" funding entry generally reflects years in which a project was not active (e.g., it had not started or it had come to an end).
3. Some multiyear projects receive all of their funding in the fiscal year of the authorization and appropriation. For those, the dollars authorized and appropriated are shown for that fiscal year. The remaining funding entries show \$0 for the years that the project is active.
4. Some intramural projects/programs are supported out of operational costs. For those projects \$0 is entered for the funds in the fiscal years that the project is active.
5. Programs consisting of multiple projects are represented in one of two ways, depending on how funds are centrally allocated:
  - a. Funds centrally allocated to the program: These programs are shown in the table as a main program indicated by a project designation such as DoD-1, and projects in the program as DoD-1A, DoD-1B, etc. All funds are shown under the main program. Blank funding entries are shown for the individual projects.
  - b. Funds centrally allocated to projects within a program: The funds for these programs are only indicated by their projects without a main program identifier, for example, VA-2A and VA-2B.
6. Funds listed under FY'01 are only projections at this time.

**Specific**

1. DoD-4 is part of a larger US Army study (DoD-23) conducted at Walter Reed Army Institute Research. All funding is combined into project DoD-23. DoD-8A and 8B are also parts of a larger US Army study and all funding is combined and shown under program DoD-8.
2. HHS-3 and HHS-4 were funded from FY'91 and FY'93 appropriations, respectively, which is not included in this accounting.
3. Funds for VA-1 for FY'94 through FY'97 represent an aggregate of funds for both the VA Mortality Study and the VA National Survey of Persian Gulf Veterans. Beginning in FY'98, VA-1 reflects continuation of the VA Mortality Study. Beginning in FY'98, VA-2A, 2B, and 2C, reflect funding for separate components of the VA National Survey of Persian Gulf Veterans.

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-1	Naval Health Study Program	C	\$725,000	\$1,010,000	\$2,250,000	\$2,000,000	\$2,654,000			\$8,639,000	
DoD-1A	Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 1: A Study of Symptoms among 1500 Seabees.	C								\$0	
DoD-1B	Epidemiologic Studies of Morbidity among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 2: A Comparative Study of Hospitalizations among Active-Duty Personnel Who Participated in the Gulf War and Similar Personnel Who Did Not.	C								\$0	
DoD-1C	Epidemiologic Studies of Morbidity among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 3: A comparative study of pregnancy outcomes among Gulf War veterans and other active-duty personnel.	C								\$0	
DoD-1D	Epidemiologic Studies of Morbidity among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 4: Infertility and Miscarriage in Gulf War Veterans.	C								\$0	

\* Status: C=Complete; O=Ongoing

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-1E	Epidemiologic Studies of Morbidity among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 5: Seabee Health Study.	C								\$0	
DoD-1F	Epidemiologic Studies of Morbidity among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 6: A Comparison of Nonfederal Hospitalization Experience Among Veterans in California who have separated from active service: PGW vs. EV.	C								\$0	
DoD-1G	Epidemiologic Studies of Morbidity among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors; Study 7: Prevalence of Congenital Anomalies Among Children of Persian Gulf War Veterans.	C								\$0	
DoD-2	Physiological and Neurobehavioral Effects in Rodents from Exposure to Pyridostigmine, Fuels, and DEET.	C	\$90,000	\$0	\$0	\$0				\$90,000	
DoD-4	The General Well-Being of Gulf War Era Service Personnel from the States of Pennsylvania and Hawaii: A Survey.	C	\$0							\$0	

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-7A	Health Risk Assessment of Embedded Depleted Uranium: Behavior, Physiology, Histology, and Biokinetic Modeling.	C	\$897,000	\$0	\$0	\$0	\$0			\$897,000	
DoD-7B	Carcinogenicity of Depleted Uranium Fragments.	C	\$897,814	\$0	\$0	\$0	\$0	\$121,400	\$0	\$1,019,214	
DoD-8	Program DoD-8.	C	\$773,000	\$895,000	\$652,000	\$695,000	\$694,000	\$0		\$3,709,000	
DoD-8A	Serologic Diagnosis of Viscerotropic Leishmaniasis (VTL).	C	\$0	\$0	\$0					\$0	
DoD-8B	Development of a Leishmania Skin Test Antigen (LSTA).	C	\$0	\$0	\$0	\$0	\$0	\$0		\$0	
DoD-9	Identification of the Genetic Factors Which Control Tropism in Leishmania.	C	\$0	\$150,000	\$0	\$0	\$0			\$150,000	
DoD-10	Pyridostigmine Synergistic Toxicity Study.	C	\$42,000	\$44,000						\$86,000	
DoD-11	Male/Female Differential Tolerances to Pyridostigmine Bromide.	C	\$549,000	\$359,000	\$0	\$0	\$0			\$908,000	
DoD-13	Effects of Persian Gulf War Service on Military Working Dogs.	O	\$0	\$0	\$97,000	\$200,000	\$120,000	\$200,000	\$0	\$617,000	
DoD-14	Risk Factors Among US Army Soldiers for Enrolling on the Department of Veterans Affairs Gulf War Registry.	C	\$120,000	\$0	\$0	\$0				\$120,000	
DoD-15	Comparative Mortality Among US Military Personnel Worldwide During Operations Desert Shield and Desert Storm.	C	\$20,000	\$0						\$20,000	

\* Status: C=Complete; O=Ongoing

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-16	Kuwait Oil Fire Health Risk Assessment.	C	\$345,000	\$137,000	\$50,000	\$127,000				\$659,000	
DoD-17	Retrospective Studies Involving Military Use of Pyridostigmine as a Pretreatment for Nerve Agent Poisoning.	C	\$21,000							\$21,000	
DoD-18	Kuwait Oil Fires Troop Exposure Assessment Model (TEAM).	O	\$68,000	\$151,000	\$770,000	\$193,000	\$290,000	\$295,000	\$295,000	\$2,062,000	\$306,000
DoD-19	Persian Gulf Veterans Health Tracking System.	O		\$25,000	\$0	\$0	\$450,000	\$450,000	\$0	\$925,000	
DoD-21	Study of Variability In Pyridostigmine Inhibition of Blood Cholinesterases in Healthy Adults and Individuals With Symptoms Following Participation in Operation Desert Storm.	C	\$38,000	\$100,000	\$0	\$0				\$138,000	
DoD-22	Chronic Organophosphorus Exposure and Cognition.	C	\$375,000	\$0	\$0	\$0	\$0			\$375,000	
DoD-23	Acute and Long-Term Impact of Deployment to Southwest Asia on the Physical and Mental Health of Soldiers and their Families.	C	\$621,000	\$688,000	\$764,000	\$985,000				\$3,058,000	
DoD-30	Epidemiological Studies Persian Gulf War Illnesses, PG Women's Health Linkage Study.	C		\$779,000	\$0	\$0	\$0	\$0	\$0	\$779,000	\$0
DoD-31	Dysregulation of the Stress Response in the Persian Gulf Syndrome.	C		\$971,000	\$0	\$0	\$0	\$0	\$0	\$971,000	

\* Status: C=Complete; O=Ongoing

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-32	Neuropsychological Functioning in Persian Gulf Era Veterans.	C		\$353,000	\$0	\$0	\$0	\$0		\$353,000	
DoD-33	Effects of Pyridostigmine in Flinders Line Rats Differing in Cholinergic Sensitivity.	C		\$354,000	\$0	\$0	\$0	\$0		\$354,000	
DoD-34	Characterization of Emissions from Heaters Burning Leaded Diesel Fuel in Unvented Tents.	C		\$283,000	\$0	\$0	\$0	\$0		\$283,000	
DoD-35	Feasibility of Investigating Whether There is a Relationship Between Birth Defects and Service in the Gulf War.	C		\$427,000	\$10,000	\$63,000	\$0	\$10,500	\$0	\$510,500	\$0
DoD-36	Fatigue in Persian Gulf Syndrome-Physiologic Mechanisms.	C		\$416,000	\$138,000	\$0	\$0	\$0		\$554,000	
DoD-37	Neurobehavioral and Immunological Toxicity of Pyridostigmine, Permethrin, and DEET in Male and Female Rats.	C		\$934,000	\$5,000	\$0	\$0	\$0		\$939,000	
DoD-38	Diagnostic Antigens of Leishmania tropica.	C		\$612,000	\$0	\$0	\$0			\$612,000	
DoD-39	A Controlled Epidemiological and Clinical Study into the Effect of Gulf War Service on Servicemen and Women of the United Kingdom Armed Forces.	C		\$865,000	\$0	\$28,400	\$155,000	\$0	\$124,868	\$1,173,268	\$0
DoD-40	Psychological and Neurobiological Consequences of the Gulf War Experience.	C		\$264,000	\$0	\$0	\$0	\$0	\$0	\$264,000	\$0

\* Status: C=Complete; O=Ongoing

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-41	Evaluation of Muscle Function in Persian Gulf Veterans.	C		\$906,000	\$0	\$0	\$0	\$0	\$0	\$906,000	
DoD-42	The Symptomatic Persian Gulf Veterans Protocol: An Analysis of Risk Factors with an Immunologic and Neuropsychiatric Assessment.	C			\$700,000	\$0	\$0	\$0	\$0	\$700,000	\$0
DoD-44	Investigation of Seminal Plasma Hypersensitivity Reactions.	C			\$634,000	\$0	\$5,000	\$14,200		\$653,200	
DoD-45	Physical and Emotional Health of Gulf War Veterans Women.	C			\$100,000	\$100,000	\$0	\$0		\$200,000	
DoD-46	Exploratory Data Analysis with the CCEP Database.	C			\$60,000	\$100,000				\$160,000	
DoD-47	Study of Mycoplasmal Infections in Gulf War Veterans.	C			\$112,000	\$0	\$0			\$112,000	
DoD-48	Assessment of Genomic Instability via Chromosome 7 Inversion Frequency in a Gulf War Syndrome Cohort vs. Selected Control Groups.	C			\$74,000	\$0	\$0			\$74,000	
DoD-49	Diagnosis and Dosemity of Exposure to Sulfur Mustard: Development of Standard Operating Procedures and Exploratory Research on Protein Adducts.	C			\$927,000	\$0	\$0	\$0	\$0	\$927,000	

\* Status: C=Complete; O=Ongoing

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-50	Toxicokinetics of O-Ethyl S-(2-Diisopropylaminoethyl) Methylphosphonothioate [(+)-VX] in Rats, Hairless Guinea Pigs and Marmosets - Identification of Metabolic Pathways.	C			\$699,000	\$0	\$0	\$0		\$699,000	
DoD-51	Transgenic Engineering of Cholinesterases: Tools for Exploring Cholinergic Responses.	C			\$864,000	\$0	\$0	\$0	\$0	\$864,000	
DoD-52	Female Gender and Other Potential Predictors of Functional Health Status Among Persian Gulf War Veterans.	C	\$414,000	\$0	\$0	\$0	\$0	\$0		\$414,000	
DoD-53	Long-Term Effects of Subclinical Exposures to Sarin.	C			\$1,000,000	\$400,000	\$0	\$0	\$217,137	\$1,617,137	\$0
DoD-54	Assessment of Subchronic Neurobehavioral and Neuropathologic Effects in Rats Following Low-Level Sarin Exposure.	C			\$315,000	\$100,000	\$0	\$0	\$0	\$415,000	
DoD-55	Low-Level Exposure to GB Vapor in Air: Diagnosis/Dosimetry, Lowest Observable Effect Levels, Performance-Incapacitation, and Possible Delayed Effects.	C			\$500,000	\$136,000	\$0	\$0	\$0	\$636,000	\$0
DoD-56	Low-Level Sarin Neurotoxicity and Its Modulation by Pyridostigmine.	C			\$685,000	\$100,000	\$0	\$0	\$0	\$785,000	\$0

\* Status: C=Complete; O=Ongoing

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-57	Physiologic Effects of Stress in Gulf War Veterans.	C				\$909,000	\$0	\$0	\$0	\$909,000	\$0
DoD-58	Illness Among Persian Gulf War Veterans: Case Validation Studies.	O				\$2,208,000	\$0	\$0	\$0	\$2,208,000	\$0
DoD-59	Pyridostigmine-induced Neurodegeneration: Role of neuronal Apoptosis.	C				\$625,000	\$0	\$0	\$0	\$625,000	\$0
DoD-60	Butyrylcholinesterase Genetic Variants in Persons with Gulf War Illness.	C				\$125,000	\$0	\$0		\$125,000	
DoD-61	Neurophysiologic and Neuropathologic Effects in Monkeys of Low Level Exposures to Sarin, Pyridostigmine, Pesticides, and Botulinum Toxoid.	C				\$1,586,000	\$0	\$0	\$0	\$1,586,000	
DoD-62	Sarin and Pyridostigmine Interaction under Physical Stress: Neurotoxic Effects in Mice.	C				\$201,000	\$0	\$0		\$201,000	
DoD-63	PGW Veterans: Epidemiological and Clinical Evidence for Residual Organophosphate Neurotoxicity.	C				\$1,626,000	\$0	\$0	\$0	\$1,626,000	
DoD-64	Individual Differences in Neurobehavioral Effects of Pyridostigmine.	C				\$1,900,000	\$18,516	\$0	\$190,595	\$2,109,111	\$0

\* Status: C=Complete; O=Ongoing

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-65	Multi-Disciplinary Pathophysiologic Studies of Neurotoxic Gulf War-Related Neurologic Syndromes Leading to Diagnosis and Treatment.	C				\$3,000,000	\$0	\$0	\$0	\$3,000,000	
DoD-66	Testing for Micoplasmal Infection Replicability of Nucleoprotein Gene Tracking and Forensic Polymerase Chain Reaction.	C			\$49,940	\$100,000	\$40,000	\$403,000	\$140,319	\$733,259	\$0
DoD-67	Antibacterial Treatment Method Based Upon the Excretion of Dead and Decaying Spherical Bacteria.	C				\$3,400,000	\$0	\$0		\$3,400,000	
DoD-69	Five Year Follow-Up of Army Personnel Potentially Exposed to Chemical Warfare Agents.	O				\$946,160	\$0	\$0	\$110,000	\$1,056,160	\$0
DoD-70	War Syndromes from 1900 to the Present: Symptom Patterns and Long Term Health Outcomes.	C				\$734,687	\$0	\$115,000	\$0	\$849,687	\$0
DoD-71	A Comparison of Post-Deployment Hospitalization Incidence between Vietnam and Gulf War Veterans.	C				\$566,000	\$0	\$0	\$0	\$566,000	
DoD-72	Long-Term Effects of Subchronic Exposure to Sarin, Alone and with Stress and Other Chemicals.	O				\$996,000	\$0	\$0	\$0	\$996,000	\$0

\* Status: C=Complete; O=Ongoing

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-73	Post-Deployment Morbid Stress, Behavior and Health: Developing a Model for Predicting Morbidity, Mortality, and other Adverse Outcomes.	O				\$500,000	\$0	\$0	\$0	\$500,000	\$0
DoD-74	Relationship of Stress Exposures to Health in Gulf War Veterans.	O				\$161,489	\$1,991,330	\$0	\$0	\$2,152,819	\$0
DoD-75	Toxic Interactions of Prophylactic Drugs and Pesticides.	O					\$1,380,157	\$0	\$0	\$1,380,157	\$0
DoD-76	Evaluation of Immunotoxicity Due to Concurrent Exposure to DEET, Pyridostigmine, and JP-8 Jet Fuel.	O					\$448,369	\$0	\$0	\$448,369	\$0
DoD-77	Percutaneous Absorption of Chemical Mixtures Relevant to the Gulf War.	O					\$760,031	\$0	\$0	\$760,031	\$0
DoD-78	Experimental Models of Gulf War Syndrome.	O					\$2,179,097	\$444,800	\$0	\$2,623,897	\$0
DoD-79	Time-course of Stress-Induced Impairment of the Blood Brain Barrier.	C				\$100,200	\$0	\$0	\$0	\$100,200	
DoD-80	Molecular Regulation of Corticosteroid Receptor Expression in Stress-Responsive Cells.	O				\$297,400	\$0	\$0	\$0	\$297,400	\$0
DoD-81	Immunotoxicity Due to Coexposure of DEET, Pyridostigmine, and Stress.	O				\$300,000	\$0	\$0	\$0	\$300,000	\$0
DoD-82	Feasibility of Developing a Registry of PTSD-Affected Veteran Sib Pairs.	C				\$172,000	\$0	\$0	\$0	\$172,000	

\* Status: C=Complete; O=Ongoing

**Department of Defense Gulf War Research Funding**

<b>PROJECT NO</b>	<b>PROJECT TITLE</b>	<b>STATUS*</b>	<b>FY 1994</b>	<b>FY 1995</b>	<b>FY 1996</b>	<b>FY 1997</b>	<b>FY 1998</b>	<b>FY 1999</b>	<b>FY 2000</b>	<b>TOTALS FY '94-'00</b>	<b>FY 2001 Projection</b>
DoD-83	Risk for Stress-Related Substance Abuse: Effects of Family History of Alcoholism.	O				\$299,700	\$0	\$0	\$0	\$299,700	\$0
DoD-84	Psychobiological Alterations Of Persian Gulf War Veterans with and without PTSD.	O				\$300,000	\$0	\$0	\$0	\$300,000	\$0
DoD-85	Central Nervous System Cytokines and CRH in Gulf War Veterans with Multiple Unexplained Symptoms.	O				\$149,900	\$149,200	\$0	\$0	\$299,100	\$0
DoD-86	Effects of Combat Stress on the Structure and Function of the Hippocampus.	O				\$300,000	\$297,800	\$0	\$0	\$597,800	\$0
DoD-87	Measurement and Validation of Psychosocial Risk and Resilience Factors Accounting for Physical and Mental Health and Health-Related Quality of Life among PGWVs.	O				\$289,100	\$0	\$0	\$0	\$289,100	\$0
DoD-88	Clinical Relevance of Novel Immunological Markers in PTSD.	O				\$242,300	\$0	\$0	\$0	\$242,300	\$0
DoD-89	Limbic Blood Flow and Opiate Receptor PET in Posttraumatic Stress Disorder.	O				\$288,500	\$0	\$0	\$0	\$288,500	\$0
DoD-90	SPECT Benzodiazepine Receptor and MR Imaging in PTSD.	O				\$200,000	\$100,000	\$0	\$0	\$300,000	\$0
DoD-91	Neurological and Circadian Substrates of PTSD-Like Behaviors.	O				\$300,000	\$299,000	\$0	\$0	\$599,000	\$0

\* Status: C=Complete; O=Ongoing

**Department of Defense Gulf War Research Funding**

<b>PROJECT NO</b>	<b>PROJECT TITLE</b>	<b>STATUS*</b>	<b>FY 1994</b>	<b>FY 1995</b>	<b>FY 1996</b>	<b>FY 1997</b>	<b>FY 1998</b>	<b>FY 1999</b>	<b>FY 2000</b>	<b>TOTALS FY '94-'00</b>	<b>FY 2001 Projection</b>
DoD-92	Traumatic Experiences Persistently Enhance Cue-dependeent Learning: Toward and Animal Model of Chronic Stress and Posttraumatic Stress Disorder.	O				\$249,700	\$0	\$0	\$0	\$249,700	\$0
DoD-93	Troops Exposed to Nerve Agents at Aberdeen Proving Ground: Follow-Up.	O						\$970,700	\$0	\$970,700	\$0
DoD-94	Combined Analysis of the VA and DoD Gulf War Clinical Registries: A Study of Clinical Findings from Systematic Medical Examinations of 100,000 U.S. Gulf War Veterans.	O						\$1,318,069	\$206,727	\$1,524,796	\$0
DoD-95	Development of Diagnostic tools and alternative treatment drugs for Leishmania.	O						\$1,500,000	\$1,500,000	\$3,000,000	\$1,500,000
DoD-96	Deployment Health Center.	O						\$1,500,000	\$1,500,000	\$3,000,000	\$1,750,000
DoD-97	Surveillance of B. pertussis among Military Trainees with Respiratory Disease: Development and Validation of a Highly Sensitive PCR and Beacon Probe based Method for Diagnosis of Pertussis.	O						\$177,300	\$146,742	\$324,042	\$151,202
DoD-98	Investigation of a Baseline Medical Database to Evaluate the Health of Military Forces and Veterans.	C						\$332,500	\$188,000	\$520,500	

\* Status: C=Complete; O=Ongoing

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-99	DoD-wide Medical Surveillance for Potential Long-Term Adverse Events associated with Anthrax Immunization in Active Duty Service Members, Proposal 1: Hospitalizations.	O						\$207,876	\$204,205	\$412,081	\$224,265
DoD-100	Antibodies to Squalene.	C						\$582,756	\$0	\$582,756	
DoD-101	Mechanisms in Chronic Multisymptom Illnesses.	O						\$2,903,408	\$5,558,000	\$8,461,408	\$5,431,062
DoD-102	Case-control Study of Fatal Motor Vehicle Crashes Among Gulf War and Non-deployed Veterans.	O						\$249,908	\$254,047	\$503,955	\$0
DoD-103	Human Metabolism & Interactions of Deployment-related Chemicals.	O						\$686,332	\$46,315	\$732,647	\$0
DoD-104	Clinical Evaluation of a Proposed New Gulf War Syndrome.	O						\$999,998	\$9,311	\$1,009,309	\$0
DoD-105	Neuroplasticity and Calcium Signaling in Stressed Rat Amygdala.	O						\$950,490	\$0	\$950,490	\$0
DoD-106	The role of Th1/Th2 cytokine balance in Gulf War-related Illness.	O						\$292,411	\$0	\$292,411	\$0
DoD-107	Stress, Organophosphates and Blood Brain Barrier Integrity.	O						\$875,373	\$10,825	\$886,198	\$0
DoD-108	Health Status of Current National Guard Members.	O						\$498,166	\$0	\$498,166	\$0

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-109	Disordered responses to Orthostatic Stress in the Pathogenesis of Gulf War Syndrome Symptoms.	O						\$917,762	\$147,523	\$1,065,285	\$0
DoD-110	Predictors of Career and Family Dysfunction in Young Adults Enlisting in the United States Navy.	O						\$127,920	\$63,705	\$191,625	\$0
DoD-111	Autonomic Dysfunction in Gulf War Veterans.	O						\$999,481	\$0	\$999,481	\$0
DoD-112	Role of Respirable Saudi Arabian Sand and Pyridostigmine in the Gulf War Syndrome: An Autoimmune Adjuvant Disease?	O						\$256,916	\$0	\$256,916	\$0
DoD-113	Interactions of Subsymptomatic Doses of Sarin with Pyridostigmine-Neurochemical, Behavioral, and Physiological Effects.	O						\$857,140	\$56,000	\$913,140	\$57,000
DoD-114	A Re-Examination of Neuropsychological Functioning in Persian Gulf War Veterans.	O						\$593,712	\$0	\$593,712	
DoD-115	A Randomized Multi-Center Controlled Trial of Multi-Model Therapy in Veterans with Gulf War Illness (EBT) (see also VA-62; formerly VA/DoD-1D).	O						\$1,000,000	\$2,000,000	\$3,000,000	\$0
DoD-116	VA/DoD Core Funding of the Medical Follow-up Agency (See also VA-63; formerly VA/DoD-2D).	O	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$1,750,000	\$250,000

\* Status: C=Complete; O=Ongoing

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-116A	Follow-Up Investigation of Troops Exposed to Nerve Agents at Aberdeen Proving Ground, (Pilot Study) (See also VA-63A; formerly VA/DoD-2DA).	C				\$0	\$0			\$0	
DoD-116B	Patterns of Pre-Persian Gulf War Illness and Health Care Seeking, Pilot Study (See also VA-63B; formerly listed as VA/DoD-2DB).	C				\$0	\$0	\$0		\$0	
DoD-117	Patterns of Pre-Persian Gulf War Illness and Health Care Seeking.	O							\$1,232,050	\$1,232,050	\$0
DoD-118	An Epidemiological Investigation into the Occurrence of Amyotrophic Lateral Sclerosis (ALS) among GWVs (See also VA-61).	O							\$430,824	\$430,824	\$832,272
DoD-119	Antibiotic Treatment of Gulf War Veterans' Illnesses (ABT).	O						\$500,000	\$1,000,000	\$1,500,000	\$0
DoD-120	Assessing Potential Health Impact of the Gulf War on Saudi Arabia National Guard Members and Their Dependents.	O						\$239,000	\$316,000	\$555,000	
DoD-121	Evaluation of the Health Risks of Embedded Depleted Uranium Shrapnel on Pregnancy and Offspring Development.	O				\$300,000	\$250,000	\$25,000	\$15,000	\$590,000	\$15,000
DoD-122	Carcinogenic Potential of Depleted Uranium and Tungsten Alloys.	O				\$25,000	\$25,000	\$25,000	\$30,000	\$105,000	\$35,000
DoD-123	Immunotoxicity of Depleted Uranium and Heavy Metal Tungsten Alloys.	O						\$15,000	\$20,000	\$35,000	\$15,000

### Department of Defense Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
DoD-124	Randomized, Controlled Trial of Combination Treatment with Pyridostigmine, DEET, and Permethrin.	O						\$1,283,218	\$0	\$1,283,218	\$0
	<b>Total DoD Funds</b>		<b>\$6,245,814</b>	<b>\$10,973,000</b>	<b>\$11,705,940</b>	<b>\$28,875,536</b>	<b>\$12,556,500</b>	<b>\$23,189,336</b>	<b>\$16,263,193</b>	<b>\$109,809,319</b>	<b>\$10,566,801</b>

\* Status: C=Complete; O=Ongoing

### Health and Human Services Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*		FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY2000	TOTALS FY '94-'00	FY 2001 Projection
HHS-1	Health Assessment of Persian Gulf War Veterans from Iowa	C		\$1,764,762	\$1,616,755	\$0	\$0	\$162,000	\$0	\$3,543,517	\$0
HHS-2	Disease Cluster in a PA Air National Guard Unit	C		\$750,000	\$0	\$0	\$16,055	\$0	\$0	\$766,055	
HHS-3	Biomarkers of Susceptibility and Polycyclic Aromatic Hydrocarbon (PAH) Exposure in Urine and Blood Cell DNA from U.S. Army Soldiers Exposed to Kuwaiti Oil	C	\$0	\$0	\$0	\$0	\$0			\$0	
HHS-4	Suspected Increase of Birth Defects and Health Problems Among Children Born to Persian Gulf War Veterans in Mississippi	C	\$0	\$0	\$0					\$0	
HHS-5	Cognitive Function and Symptom Patterns in Gulf War Veterans	O					\$600,000	\$558,000	\$660,000	\$1,818,000	\$0
HHS-6	Defining Gulf War Illnesses	O					\$600,000	\$480,000	\$719,792	\$1,799,792	\$200,000
HHS-7	Immunotoxicity of Dermal Permethrin and Cis-Urcanic Acid	O					\$175,706	\$192,445	\$187,647	\$555,798	\$0
HHS-8	Strategy to Identify Non-additive Response to Chemical Mixtures	C					\$242,586	\$247,933	\$0	\$490,519	\$0
	<b>Total HHS Funds</b>		<b>\$0</b>	<b>\$2,514,762</b>	<b>\$1,616,755</b>	<b>\$0</b>	<b>\$1,634,347</b>	<b>\$1,640,378</b>	<b>\$1,567,439</b>	<b>\$8,973,681</b>	<b>\$200,000</b>

\* Status: C=Complete; O=Ongoing

### Department of Veterans Affairs Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
VA-1	Mortality Follow-up Study of Persian Gulf Veterans, Second Update.	O	\$546,000	\$340,000	\$1,980,000	\$440,032	\$178,197	\$166,848	\$176,440	\$3,827,517	\$170,181
VA-2	National Health Survey of Persian Gulf Veterans.	O									
VA-2A	National Health Survey of Persian Gulf Veterans - Phase I.	C	\$0	\$0	\$0	\$0	\$18,111			\$18,111	
VA-2B	National Health Survey of Persian Gulf Veterans - Phase II.	C			\$0	\$0	\$0	\$0		\$0	
VA-2C	National Health Survey of Persian Gulf Veterans - Phase III.	O					\$1,601,280	\$3,571,932	\$3,400,000	\$8,573,212	\$2,400,000
VA-3	Use of Roster of Veterans Who Served In Persian Gulf Area.	C	\$0	\$0	\$0	\$0	\$0	\$0		\$0	
VA-4 TOTAL	Boston Environmental Hazards Research Center Program.	C	\$98,300	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$232,500	\$2,830,800	
VA-4Core	Boston Environmental Hazards Research Center Program.	C									
VA-4A	Evaluation of Cognitive Functioning in Persian Gulf Veterans.	C									
VA-4B	Evaluation of Neurological Functioning in Persian Gulf Veterans.	C									
VA-4C	Gulf War and Vietnam Veterans Cancer Incidence Surveillance.	C									
VA-4D	Evaluation of Respiratory Dysfunction among Gulf War Veterans.	C									
VA-4E	The Aromatic Hydrocarbon Receptor (AhR) as a Biomarker for Susceptibility.	C									

\* Status: C=Complete; O=Ongoing    2000 Annual Report to Congress on Gulf War Veterans' Illnesses -- APPENDIX

### Department of Veterans Affairs Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
VA-4F	Validity of Computerized Tests	C									
VA-5 TOTAL	East Orange Environmental Hazards Research Center Program	C	\$100,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$326,900	\$2,926,900	
VA-5 Core	East Orange Environmental Hazards Research Center Program	C									
VA-5A	Health and Exposure Survey of Persian Gulf Veterans	C									
VA-5B	Physiological and Psychological Assessments of Persian Gulf Veterans.	C									
VA-5C	Effects of Exertion and Chemical Stress on Persian Gulf Veterans.	C									
VA-5D	Effects of Genetics and Stress on Responses to Environmental Toxins.	C									
VA-6 TOTAL	Portland Environmental Hazards Research Center: Environment, Veterans' Gulf War Syndrome. Core: Clinical and Epidemiology Research.	C	\$99,279	\$499,583	\$498,695	\$499,198	\$499,926	\$499,098	\$233,290	\$2,829,069	
VA-6 Core	Core Program: Portland Environmental Hazards Research Center: Environment, Veterans Health and Gulf War Syndrome. Core Project for Clinical and Epidemiology Research.	C									
VA-6A	Psychosocial, Neuropsychological and Neurobehavioral Assessment (Project I).	C									

\* Status: C=Complete; O=Ongoing

### Department of Veterans Affairs Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
VA-6B	Clinical and Neuroendocrine Aspects of Fibromyalgia (Project II).	C									
VA-6C	Neurotoxicity of Environmental Pollutants and Warfare Agents (Project III).	C									
VA-6D	DNA Damage from Chemical Agents and Its Repair (Project IV).	C									
VA-6E	Clinical and Epidemiology of Leishmania Research.	C									
VA-7	Desert Storm Reunion Survey.	C	\$0	\$50,000						\$50,000	
VA-8	Psychological Test Data of Gulf War Veterans Over Time.	O	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
VA-9	Evaluation of Cognitive Functioning in Persian Gulf War Veterans Reporting War-related Health Problems.	C		\$20,000						\$20,000	
VA-10	Memory and Attention in PTSD	C			\$63,700	\$57,000	\$57,600	\$0		\$178,300	
VA-11	Neuropsychological Functioning in Veterans	C	\$0	\$0						\$0	
VA-12	Psychological Assessment of Operation Desert Storm Returnees	C	\$0	\$0	\$0	\$0				\$0	
VA-13	Neurobehavioral Aspects of Persian Gulf Experiences : A Pilot Study	C	\$0	\$50,000						\$50,000	
VA-15	Vaccine-Mediated Immunity against Leishmaniasis	O	\$64,300	\$64,300	\$0	\$82,600	\$80,000	\$79,400	\$119,100	\$489,700	\$119,600
VA-16	Protective Immunity in Experimental Leishmaniasis	C		\$60,200	\$60,700	\$54,900				\$175,800	
VA-17	Immunological Evaluation of Persian Gulf Veterans	C	\$0	\$0						\$0	

\* Status: C=Complete; O=Ongoing

### Department of Veterans Affairs Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
VA-18	Chronic Gastrointestinal Illness in Persian Gulf Veterans	C		\$0	\$0					\$0	
VA-20	Psychological Adjustment in Operation Desert Shield/ Storm Veterans	C	\$0							\$0	
VA-21	A Comparison of PTSD Symptomology among Three Army Medical Units Involved in ODS	C	\$0	\$0						\$0	
VA-36	Stress Symptoms and their Casual Attribution in Desert Storm Veterans.	C		\$0	\$0	\$0				\$0	
VA-40	Musculoskeletal Symptoms in Gulf War Syndrome.	C	\$0	\$0	\$0	\$0	\$0	\$0		\$0	
VA-46	Diarrhea in Persian Gulf Veterans: An Irritable Bowel-Like Disorder.	C		\$0	\$0	\$0	\$0	\$0	\$0	\$0	
VA-47	Louisville Center for the Study of Environmental Hazards to Reproductive Health.	C				\$349,700	\$272,570	\$292,481	\$139,960	\$1,054,711	
VA-48	Cross-Sensitization as a CNS Model for Chemical Intolerance.	C					\$99,900	\$89,400	\$92,840	\$282,140	\$45,000
VA-49	Sensitivity to Pyridostigmine Bromide: Persistent Neural Dysfunction.	O					\$184,400	\$147,950	\$144,024	\$476,374	\$82,050
VA-50	Neuropsychological findings in a sample of Desert Storm Veterans.	C		\$0	\$0					\$0	
VA-51	Psychobiological Assessment of Desert Storm Veterans.	O	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
VA-53	Spouses and Childrens' Program.	O				\$101,360	\$98,651	\$51,088	\$25,000	\$276,099	\$25,000

\* Status: C=Complete; O=Ongoing

### Department of Veterans Affairs Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
VA-54	Follow-up of Psychological and Neurocognitive Gulf War Outcome: Relation to Stress.	O						81,750	90,131	\$171,881	\$90,131
VA-55	Antibiotic Treatment of Gulf War Veterans' Illnesses (ABT).	O						\$447,742	\$1,466,375	\$1,914,117	\$1,800,000
VA-56	Birmingham's Gulf War Veterans' Illness Demonstration Clinic (13).	C					\$54,100	\$261,625	\$161,175	\$476,900	
VA-57	Case Management and Residential Rehabilitation for Persian Gulf War Veterans (13).	C					\$71,625	\$253,625	\$174,750	\$500,000	
VA-58	Implementation and Evaluation of Gulf War Veterans' Demonstration Project (13).	C					\$84,714	\$349,805	\$262,496	\$697,015	
VA-59	Demonstration Treatment Program for Gulf War Veterans with Unexplained Physical Symptoms (13)	C					\$45,750	\$348,225	\$259,500	\$653,475	
VA-60	Identification and Management of Sleep Disorders in Gulf War Veterans (13).	C					\$121,125	\$328,500	\$246,375	\$696,000	
VA-61	An Epidemiological Investigation into the Occurrences of Amyotrophic Lateral Sclerosis (ALS) among Gulf War Veterans.	O							\$0	\$0	\$0
VA-62	A Randomized, Multi-Center Controlled Trial of Multi-Model Therapy in Veterans with Gulf War Illness (EBT) (See also DoD 115; formerly VA/DoD 1V).	O						\$788,000	3,756,826	\$4,544,826	\$2,093,760

\* Status: C=Complete; O=Ongoing

## Department of Veterans Affairs Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
VA-63	VA/DoD Core funding of Medical Follow-Up Agency (See also DoD 116; formerly VA/DoD-2V/2D).	O	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$1,750,000	\$250,000
VA-63A	Follow-up Investigation of troops exposed to nerve agents at Aberdeen Proving Ground (Pilot Study) (See also DoD-116A; formerly VA/DoD-2VA/2DA) .	C				\$0	\$0			\$0	
VA-63B	Patterns of Pre-Persian Gulf War Illness and Health Care Seeking Pilot Study (See also DoD 116B; previously VA/DoD-2VB).	C				\$0	\$0	\$0		\$0	
VA-64	Boston Environmental Hazards Research Center Program.	O							\$112,360	\$112,360	\$295,300
VA-64A	Functional Neuroimaging in Lead Exposed Adults.	O									
VA-64B	Quantification and Validation of Structure-Function relationships through visuospatial test performance.	O									
VA-64C	Development of a structural neurotoxicant assessment checklist (SNAC) for clinical use in veteran populations.	O									
VA-65	San Antonio Environmental Hazards Research Center.	O							\$116,750	\$116,750	\$300,000
VA-65A	Does a variant of human SOD2 gene increase Sensitivity to hazards?	O									

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## Department of Veterans Affairs Gulf War Research Funding

PROJECT NO	PROJECT TITLE	STATUS*	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTALS FY '94-'00	FY 2001 Projection
VA-65B	The contribution of FEN-1to genetic integrity subsequent to oxidative stress.	O									
VA-65C	The importance of hydrogen peroxide detoxification in cellular protection.	O									
VA-65D	Do defective Gpx1 and ALDH2 genes increase sensitivity to environmental exposure.	O									
VA-66	Physiological Responding in Posttraumatic Stress Disorder	C						\$0	\$0	\$0	
VA-67	Olfactory Functioning in Gulf War Veterans.	C							\$7,500	\$7,500	\$7,500
VA-68	Family Study of Fibromyalgia.	O							\$50,000	\$50,000	\$50,000
VA-69	Cardiovascular Hyporeactivity and Fatiguing Illness in Gulf War Veterans.	O							\$122,243	\$122,243	\$135,487
VA-70	A Clinical Evaluation of the Health Status of Persian Gulf War Veterans in VISN 8.	O					\$69,868	\$69,868	\$69,868	\$209,604	\$19,800
VA-71	Central Nervous System Modulation of Visceral Pain in Persian Gulf War Syndrome.	O							\$46,700	\$46,700	\$50,000
	<b>Total VA Funds</b>		<b>\$1,157,879</b>	<b>\$2,334,083</b>	<b>\$3,853,095</b>	<b>\$2,834,790</b>	<b>\$4,787,817</b>	<b>\$9,077,337</b>	<b>\$12,083,103</b>	<b>\$36,128,104</b>	<b>\$7,933,809</b>

\* Status: C=Complete; O=Ongoing

