

VA



U.S. Department
of Veterans Affairs

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Gulf War Research Program Update
Office of Research and Development
Department of Veterans Affairs
September 7-8, 2023



Background

The 1990-91 Gulf War (Operation Desert Shield/Desert Storm)

- The United States and coalition forces campaigned together to liberate Kuwait from Iraq's invasion.
- After the 43 day air campaign and 100 hour ground operation, the U.S. led coalition expelled Iraq from Kuwait.

However, a new battle was starting...

- Approximately 35% of returning troops (US and coalition forces) were experiencing new and debilitating health concerns without explanation.
- Health concerns experienced by Gulf War service members encompassed a variety of symptoms and disorders including (but not limited to):



- Systemic Inflammation
 - Cognitive Dysfunction
 - Joint Pain/Fibromyalgia
 - Irritable Bowel Syndrome
 - Skin Rash
 - Respiratory issues
- These health issues remain in Gulf War Veterans (GWV) and are known as Gulf War Illness (GWI) or chronic multi-symptom illness.
 - An ICD-10 CODE for Gulf War illness has not been defined.



Gulf War (Operation Desert Shield/Desert Storm)



Depleted Uranium



Oil Well Fires



Pesticides, solvents, fuels



Airborne Hazards

**psychological and
physical Stress**



Burn Pits



Vaccinations



Chemical & Biological Weapons



**Pyridostigmine Bromide
(PB)**

- ❖ Gulf War service members were exposed to single/combination toxicants of unknown quantities.
- ❖ Exposure assessment is a challenge.
- ❖ Basic understanding of toxic effects under military conditions is limited



VA-ORD Funding – Peer Reviewed Gulf War Research (2011-2022)

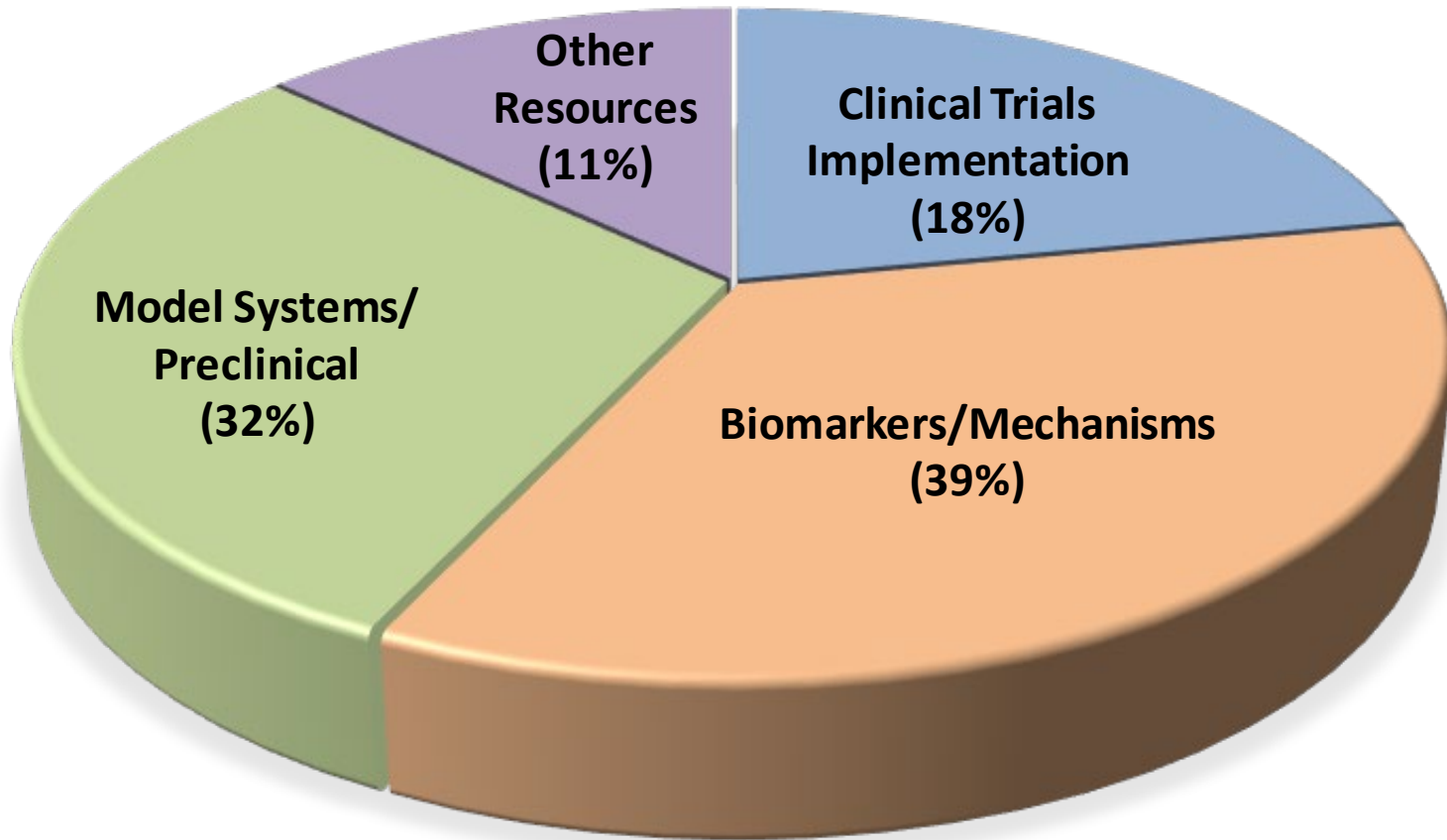
- Budget \$16M/year.
- Avg funding rate: 21%
- ~250 VA-FUNDED PROJECTS
(1997-2022)

FY	Proposals Received	Projects Funded	% Funded
2011	26	3	12%
2012	32	7	22%
2013	35	7	20%
2014	40	5	13%
2015	33	8	24%
2016	26	4	15%
2017	29	5	17%
2018	27	5	19%
2019	21	5	24%
2020	12	4	33%
2021	17	3	18%
2022	14	5	36%



VA Active Gulf War Research Projects, 2023

GULF WAR PORTFOLIO BALANCE 2023



N=28

Microbiome and Brain Gut axis
Lipid Metabolism

Oxidative Stress
Treatments



OFFICE OF RESEARCH AND DEVELOPMENT AND OFFICE OF HEALTH OUTCOMES MILITARY EXPOSURES

The Veterans Health Administration has **two complementary offices** that provide different strengths to generate evidence and inform policy on Gulf War & military exposures health outcomes

Health Outcomes Military Exposures

- Maintains Congressionally-mandated Military Environmental Exposures registries
- Provides surveillance and epidemiologic studies on exposures and health outcomes.
- Monitors scientific literature and trends in Veterans Benefits Administration claims data, Veteran healthcare, morbidity and mortality outcomes.
- Manages / supports 3 War Related Illness and Injury Study Centers (WRIISCs)
 - Clinical care, research, and education
- Manages / supports Congressionally-designated centers:
 - Airborne Hazards and Burn Pits Center of Excellence
 - Toxic Embedded Fragments/Depleted Uranium Center (TEF/DUC)

Office of Research and Development

- Funds peer-reviewed research conducted by VA field investigators.
- Supports enterprise research infrastructure to help field investigators.
 - Military Environmental Exposures (MEE) data / biorepository
 - Exposure assessment for individual-level analyses.
 - Administration / Governance
 - Cooperative Studies Program
 - Million Veteran Program

Reporting Office: Research Advisory Committee on Gulf War Veterans' illnesses (RACGWVI)



DOD CDMRP Program 2022

- The Gulf War Illness Research Program (GWIRP) was Congressionally directed in FY06 to study the health effects of deployment on U.S. Warfighters during the 1990-1991 Persian Gulf War.
- Department of Defense appropriations Bill, 2022: Transitioning the GWIRP (\$20M) to the Toxic Exposure Research Program (TERP) (\$30M)
- The GWIRP focused heavily on research to identify effective treatments for Gulf War illness.
 - Gulf War Illness Clinical Trials and Interventions Consortium (GWICTIC) to rapidly implement rigorous and innovative phase I and II clinical trials for GWI.
 - Boston Biorepository, Recruitment & Integrated Network for GWI (Biospecimens and Data Management).



September 7-8, 2023

Relevant to this meeting

Presentations: Emphasis on...

- New Alternative Methods - DARPA
- Evidence-based Research – Amy Kilbourne making research count in the clinical and benefit space
- ICD-10 CODE for GWI updates – Beatrice Golomb
- Resources for GW investigators (DODSR, VA SHIELD), Drs. Natalie Wells and Robert Bonomo Respectively
- VA-Investigator presentation – Dr. Linda Chao
- Recommendations – RACGWVI Committee



VA-ORD Gulf War Research

Thank-you

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Active Gulf War Research Projects, 2022-2023 (1 of 4)

Clinical Trials/Implementation (5)

Chatterjee, Saurabh

I01 CX002372

Title: Microbiome targeted oral butyrate therapy in Gulf War multisymptom illness

Leung, Albert Y

I01 CX001986

Title: rTMS in alleviating Pain and Co-morbid symptoms in GWVI

McAndrew, Lisa M

I01 HX002835

Title: Collaborative Specialty Care for Gulf War Illness

Niles, Barbara L

I01 CX001422

Title: Novel Interventions for Gulf War Veterans' Illnesses

SAFDAR, NASIA

1 I01 CX002471

Title: Targeting Gut-Microbiome in Veterans Deployment related Gastrointestinal and Liver diseases; CMA5- Functional metagenomics in GWI related gut dysfunction



Active Gulf War Research Projects, 2022-2023 (2 of 4)

Biomarkers/Mechanisms (11)

Berenson, Charles S

1 I01 CX002521

Title: Alveolar macrophage dysregulation in the pathogenesis of Gulf War respiratory illness.

Cook, Dane B

I01 CX001329

Title: Post Exertional Malaise in GWI: Brain Autonomic and Behavioral Interactions.

Gaddy, Jennifer

I01 BX005352

Title: Toxicant Exposure Impacts Host-pathogen interactions within the Reproductive Tract.

Hauser, Elizabeth R

1 I01 BX005902

Title: Integrating genomics and metabolomics data to identify molecular characteristics of Gulf War Veterans' illnesses.

Marx, Christine E

I01 CX001569

Title: Biomarker Candidates in Gulf War Veterans: A 10-year Follow-up Investigation.

Osterholzer, John J

I01 BX004740

Title: Advancing Non-Invasive Diagnostics and Treatments of Deployment-Related Chronic Lung Disease in Gulf War Veterans

Ravi, Nathan

I21 BX005178

Title: Toxicology study of emissions from a burn pit simulator

Reinhard, Matthew J

SPLD 001 19

Title: VA NIH Investigative Deep Phenotyping Study of Gulf War Veteran Health (Project IN-DEPTH)

Zhou, Qi Qi

I01 CX001477

Title: Mechanisms of Gulf War Illness



Active Gulf War Research Projects, 2022-2023 (3 of 4)

Model Systems/Preclinical (9)

Chatterjee, Saurabh

I01 CX001923

Title: CMA: Immune/Inflammatory Priming in Exacerbating Responses to GWVI Stressors: Implications for GWVI Treatments

Furst, Ansgar J

I01 CX002182

Title: The role of the brain stem in GWVI pathology

Galor, Anat

I01 CX002633

Title: Eye Pain and Photophobia: Ocular Signs and Symptoms As Markers of Central Abnormalities in Gulf War Illness

Kuhn, Donald M

I01 BX004757

Title: Gulf War Veterans' Illness: Symptom Chronicity via Interactions of Diet and Lifestyle Risk Factors with the Gut Microbiome

Kuhn, Donald M

1 I21 BX005850

Title: Humanized Mouse Model of Gulf War Veterans' Illness.

Lindheimer, Jacob

IK2 CX001679

Title: Acute exercise tolerance among Veterans with Gulf War Illness

Pasinetti, Giulio Maria

I01 BX004583

Title: CMA: Immune/inflammatory priming in exacerbating responses to GWVI stressors: implications for GWVI treatments

REAGAN, LAWRENCE P

I01 BX002664

Title: Immune basis for hippocampal cholinergic deficits in pyridostigmine-treated rats

Soloff, Adam Christopher

I01 CX002558

Title: Lung Cancer Susceptibility in Deployed Gulf War Veterans



Active Gulf War Research Projects, 2022-2023 (4 of 4)

Other - Resources

HUBER, BERTRAND R

I01 BX003063

Title: VA Biorepository: Gulf War Veterans' Illnesses Biorepository

- ❖ Enrolling Veterans to obtain medical records and longitudinal surveys
- ❖ Brain and spinal cord tissue to be collected post-mortem
- ❖ http://www.research.va.gov/programs/tissue_banking/gwwib/default.cfm

Helmer, Drew

CSP 2006

Title: Genomics of Gulf War Illness in Veterans

- ❖ Identified over 100k Gulf War Veterans in MVP
- ❖ Characterized over 40k with Gulf War Illness

Williams, Christina D

CSP 585

Title: Gulf War Era Cohort and Biorepository

- ❖ Deployed and non-deployed Veterans (1276 participants)
- ❖ Users of VA health care and non-users
- ❖ Surveys and blood collection
- ❖ <http://www.research.va.gov/programs/csp/585/default.cfm>