

Walter Reed Army Institute of Research (WRAIR)



***WRAIR'S CRITICAL CONTRIBUTIONS TO BIOMEDICAL INNOVATIONS FOR
INFECTIOUS DISEASE AND MILITARY PSYCHIATRY AND NEUROSCIENCE***

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COMMANDER***



Protect, Project, Sustain.



WRAIR

THE Premier Biomedical
Research **Team** for the
U.S. Department of Defense

Bottom Line Up Front



- *Infectious diseases (ID) will continue to represent a threat to the Soldier and global citizen in both conflict and peacetime.*
- *Brain health and behavioral resilience are long term legacy issues of the active Warfighter and veteran*

Welcome

WRAIR: A National Resource for Enduring Military Biomedical Needs

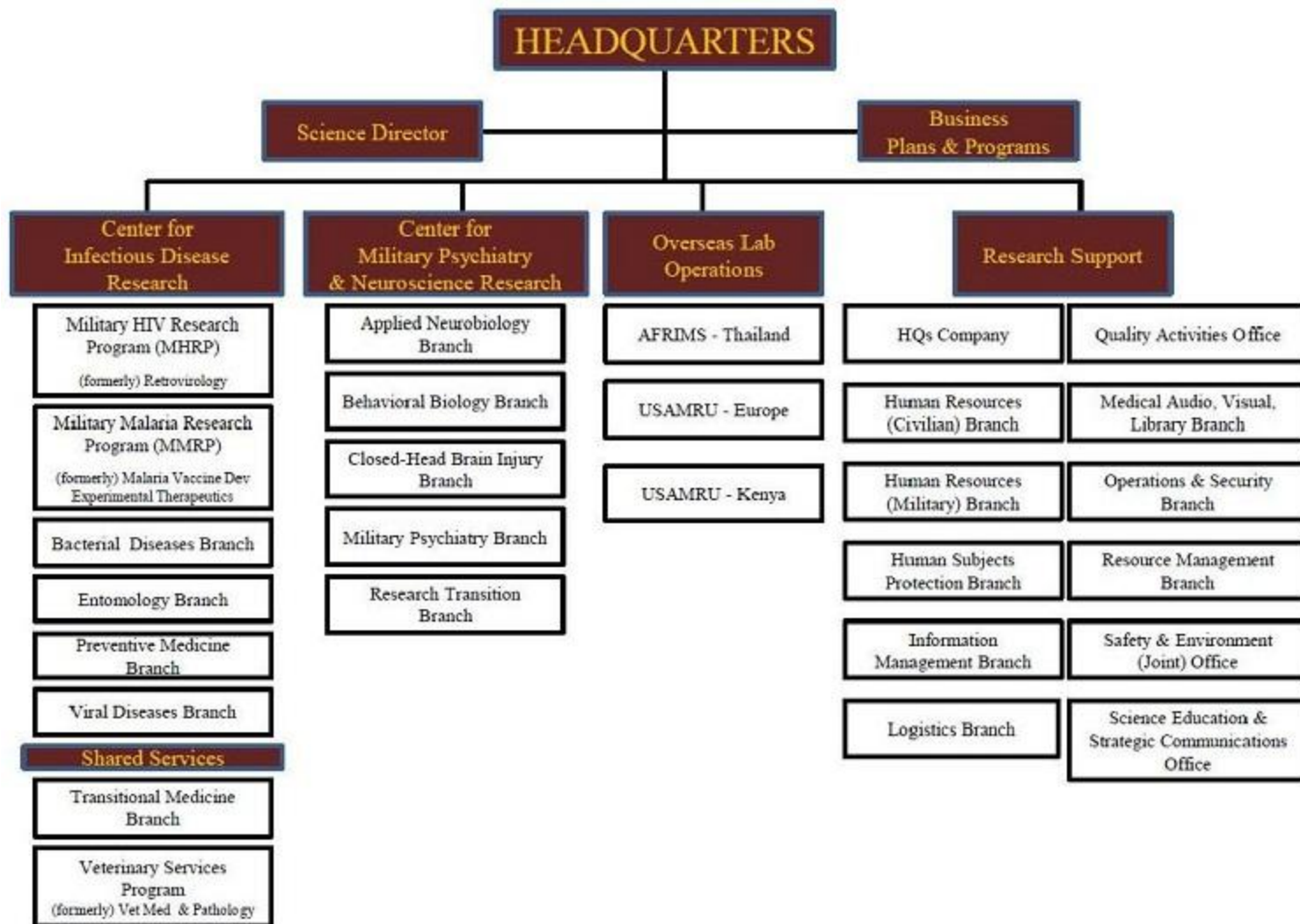
Center for Military Infectious Diseases Research

- Assets in the Continental US (CONUS) and Outside CONUS (OCONUS)
- Vaccine Development
- Drug Development
- Wound Infections
- Bench to Bedside Capacity (Clinical Trials, Bioproduction)

Center for Military Psychiatry and Neuroscience

- Psychological Resilience
- Sleep Management
- TBI, Neuroprotection and Neurorestoration
- Knowledge Products

WRAIR Organization Chart



Center for Infectious Disease Research

Malaria

HIV

Dengue

Leishmaniasis

Bacterial and
Diseases

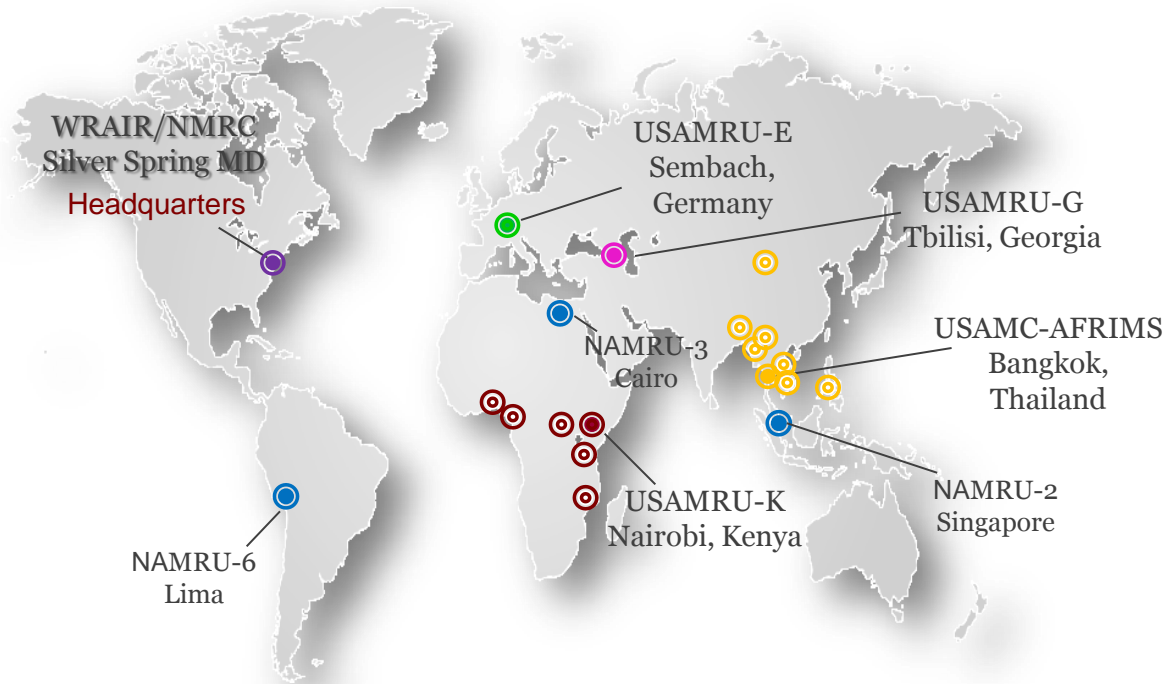
Arthropod
Vector
Control

CONUS and OCONUS Assets

Additional Research Sites

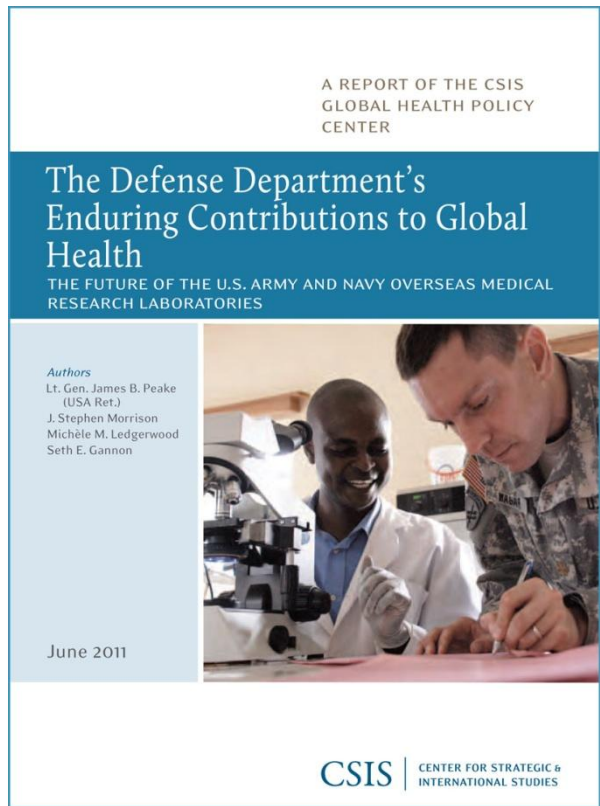
- ⊙ Tanzania
- ⊙ Uganda
- ⊙ Cameroon
- ⊙ Nigeria
- ⊙ Mozambique

- ⊙ Cambodia
- ⊙ Vietnam
- ⊙ Philippines
- ⊙ Bangladesh
- ⊙ Bhutan
- ⊙ Nepal
- ⊙ Mongolia



Unmatched International research capabilities and relationships

DoD Laboratories

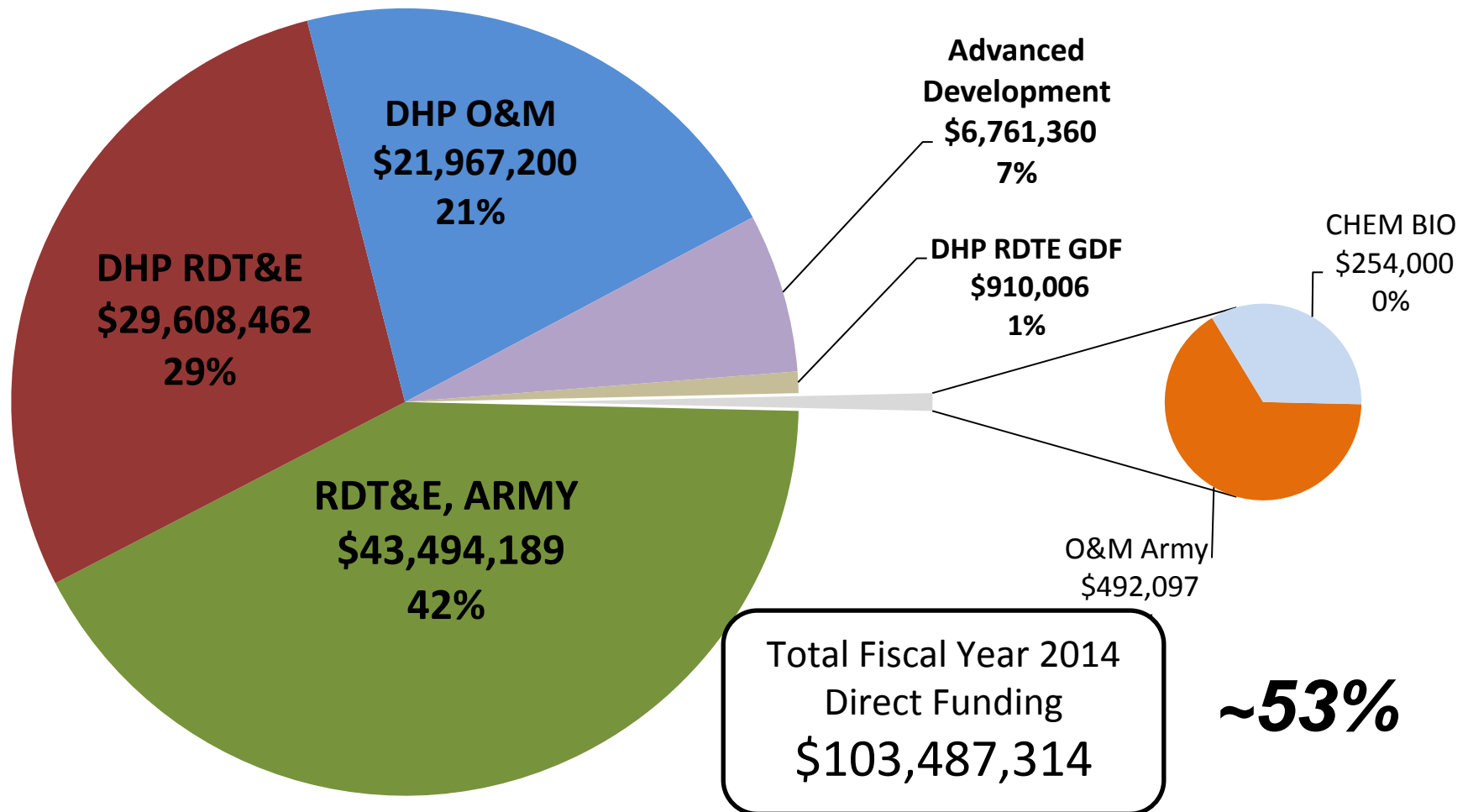


Center for Strategic International Studies (CSIS) provided Independent evaluation of DoD medical laboratories. Report released July 2011, finds that DoD labs:

- ✓ Protect deployed forces
- ✓ Fill a critical niche in developing vaccines and therapies
- ✓ Leverage partnerships with other U.S. government agencies
- ✓ Strengthen the scientific community in the host country and impact global health

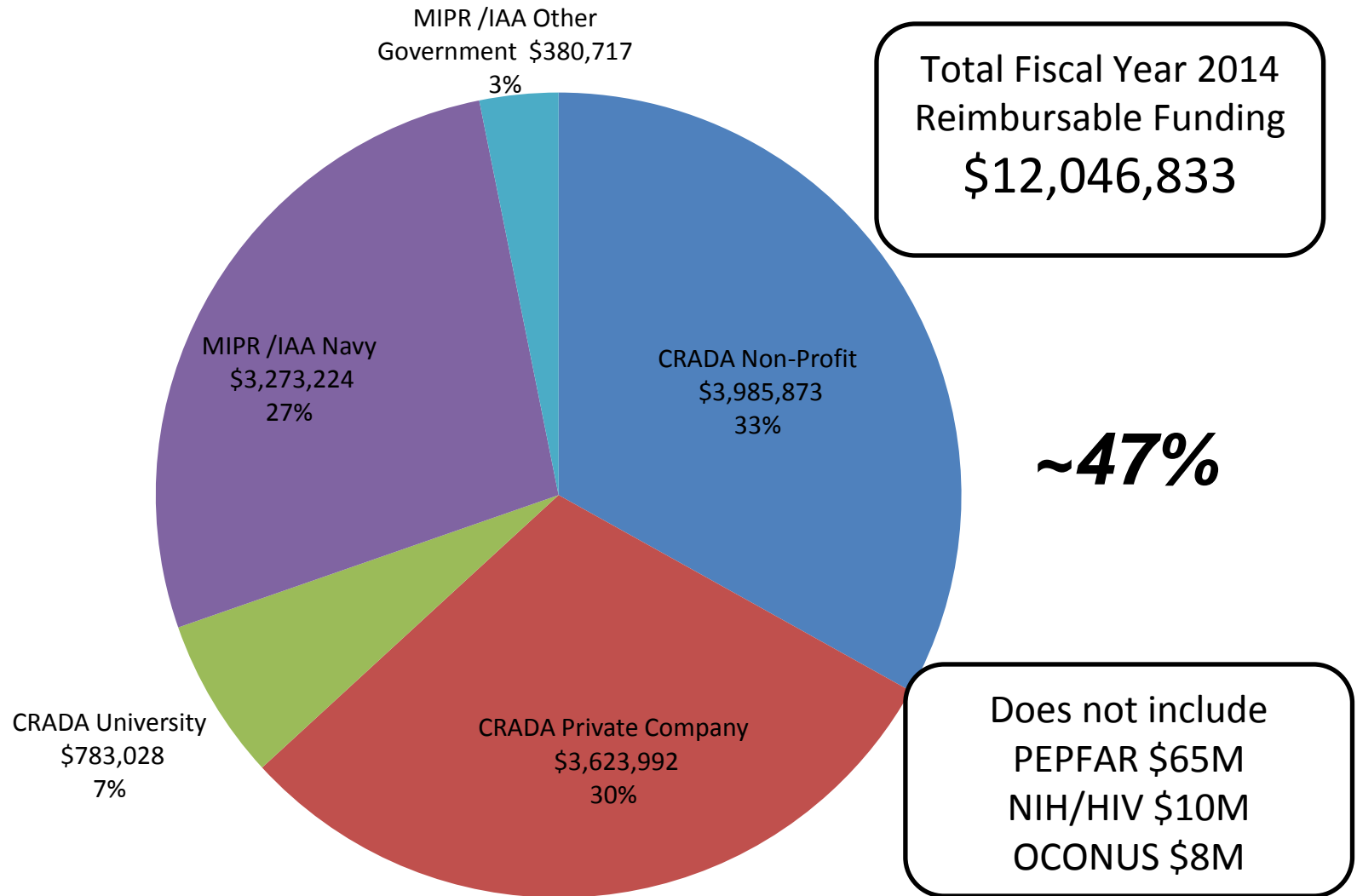
WRAIR FY 14 Direct Allotments by Funding Source

Key O&M: Operations and Management; GDF: Guidance to Develop the Force; RDT&E: Research, Development, Test and Evaluation; DHP: Defense Health Program

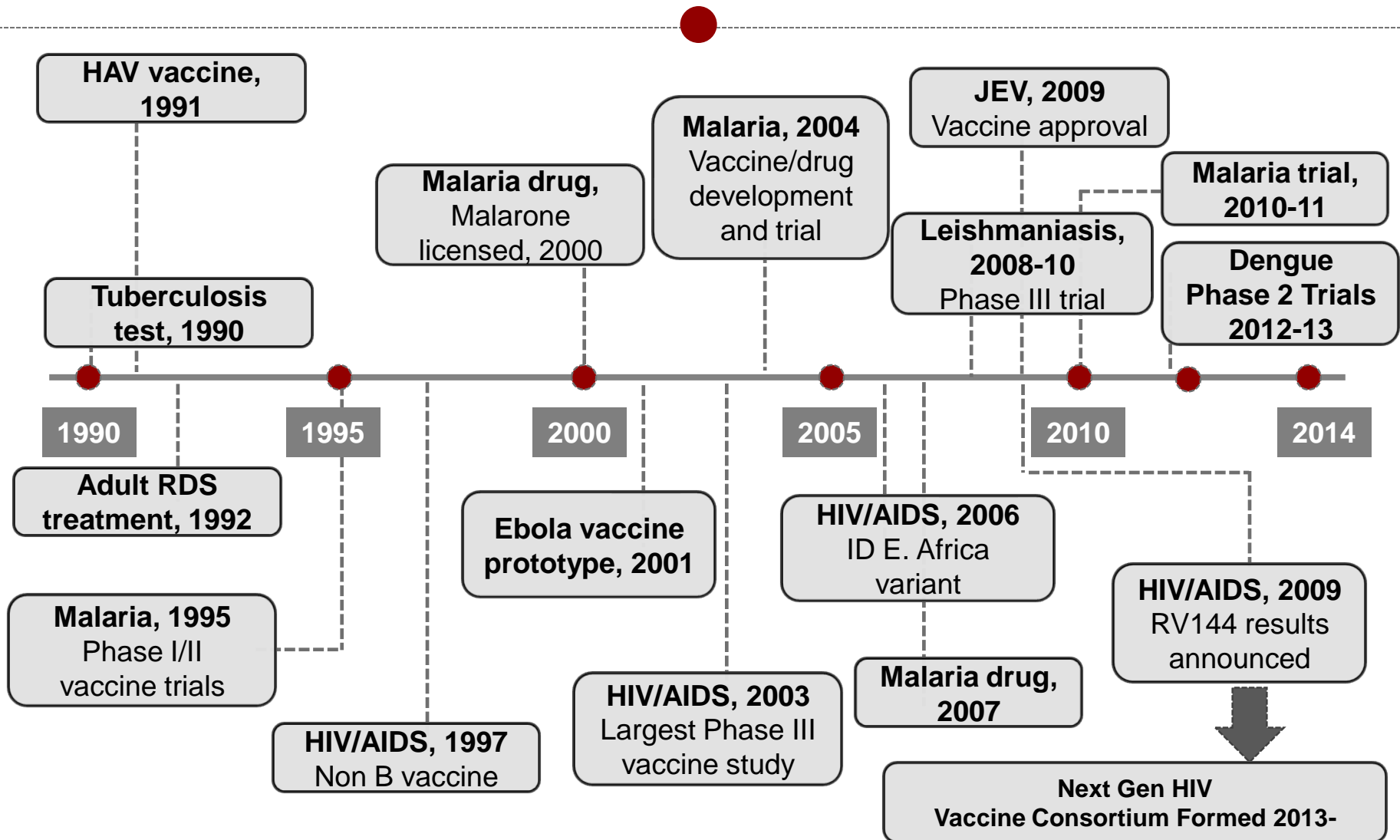


WRAIR FY 14 Reimbursables by Type and Collaborator

Key CRADA: Cooperative Research and Development Agreement; IAA: Interagency Agreement; Military Interoffice Purchase Request: MIPR



U.S. Military Contributions to ID Research



WRAIR Operations in Africa

U. S. Army Medical Research Unit-Kenya (USAMRU-K), Nairobi, Kenya

- Conducts bench science, surveillance, and testing of infectious disease medical countermeasures and diagnostics
- Approx. 40-year partnership with the Kenyan Government
- 14 Active Duty U.S. Army personnel, 2 GS
- **> 300 local employees**
- Malaria, dengue, HIV, diarrheal diseases, vector control, disease surveillance (GEIS)
- Capabilities in Kenya, Nigeria, Tanzania, and Uganda
 - R&D effort and President's Emergency Plan For AIDS Relief (PEPFAR) efforts
- Known as the Walter Reed Project (WRP)



Research and Diagnostic Centers

- Kondele Basic Science Research Lab
- Obama Children's Hospital Research Wing
- Ward 8 in-patient research facility



Malaria Diagnostic Center



*Nigerian Ministry of
Defense delegation
visits MHRP in
Rockville, Maryland*

Military to Military Collaborations

- WRAIR works directly with foreign militaries to develop HIV care and treatment programs.
- Close ties with the Nigerian, Kenyan, and Tanzanian militaries.
 - **Key element in AFRICOM medical engagement strategy**



WRAIR Operations in Georgia



- WRAIR scientists have been working in the Georgia and the surrounding region for years in support of Defense Threat Reduction Agency (DTRA) programs.
- At the request of the Georgian Prime Minister, DoD is in the process of establishing a Medical Research Unit in Tbilisi Georgia.
 - Conduct surveillance, training, research, and response activities related to emerging infectious disease threats
 - Develop vaccines, therapeutics, and prevention products

Poised for the Pivot to Asia

The U.S. military has an ongoing obligation to the health of its Service Members to ensure that effective prevention and treatment measures are readily available.

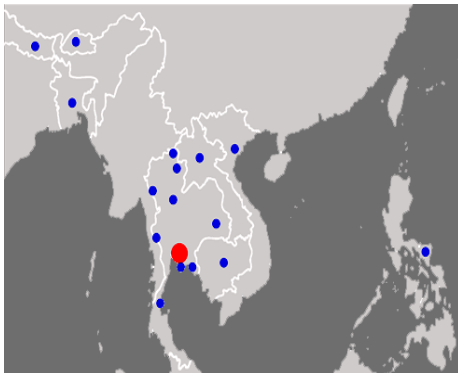
- Deployment puts Service Members at increased risk to a diverse and broad range of disease threats
 - Unique strains of malaria, Dengue, HIV
- Effective infectious disease countermeasures minimize costs:
 - Treatment
 - Lost duty time
 - Medical logistical burden
 - Sunk training/deployment costs

WRAIR Operations in Southeast Asia

Armed Forces Research Institute of the Medical Sciences (USAMC-AFRIMS) Bangkok, Thailand



- Conduct bench science, surveillance, and testing of ID medical countermeasures and diagnostics
- 28 Active Duty U.S. Army personnel
- 420+ local employees
- 50-year partnership with the Royal Thai Army conducting infectious disease research
 - Malaria, dengue, Japanese encephalitis, scrub typhus, HIV, diarrheal diseases, disease surveillance (GEIS)
- AAALAC-accredited animal facility with 600 nonhuman primates
- BSL-3 laboratory, CAP certified



- AFRIMS, Bangkok
- Field & Study Sites

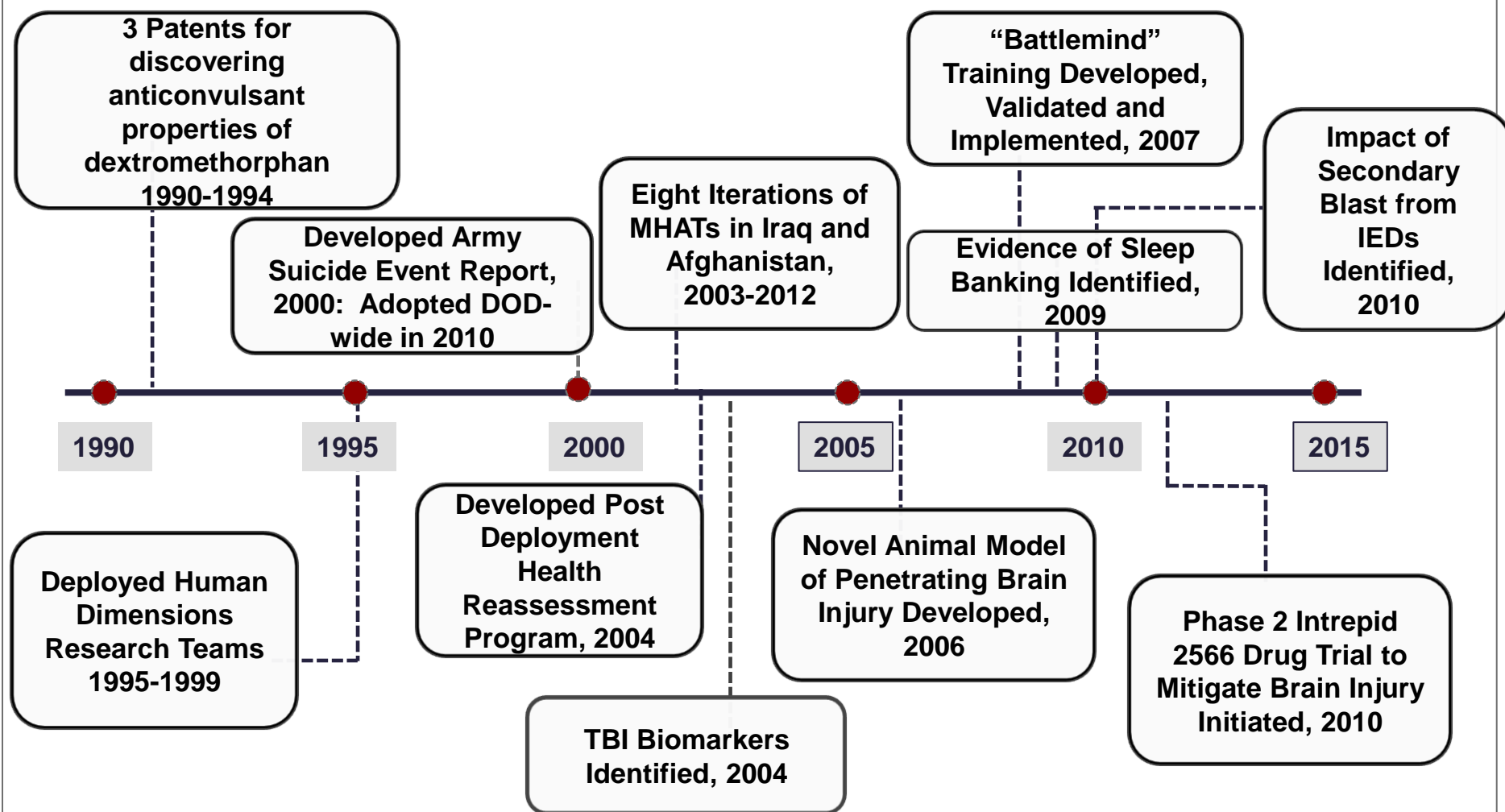
Center For Military Psychiatry and Neuroscience

**Psychological
Resilience**

**Sleep
Management**

**TBI Neuroprotection
and Neurorestoration**

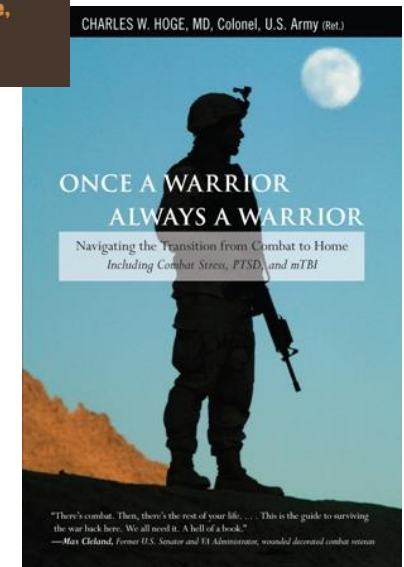
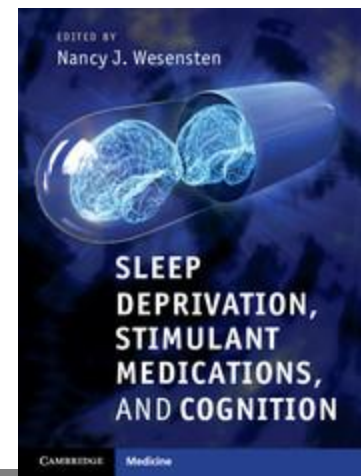
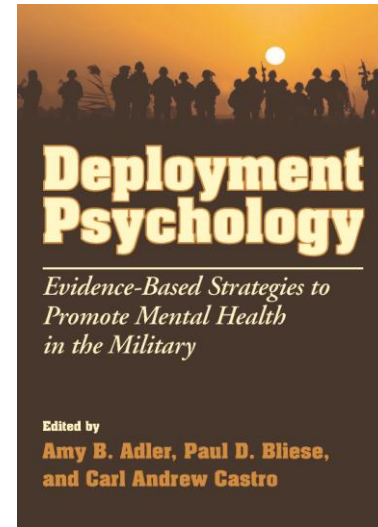
Center For Military Psychiatry and Neuroscience Contributions



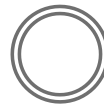
Military Psychiatry and Neuroscience

WRAIR researchers develop tools to:

diagnose, prevent, and mitigate the effects of psychological demands, continuous operations, and brain trauma on the health and well-being of our Service Members.



Military Psychiatry



MISSION: Improve psychological functioning

Reduce the impact of mental disorders

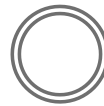
Enhance the resilience of Soldiers, Leaders, and Families

Improve diagnoses, treatment and management across the continuum of TBI

PRODUCTS: Comprehensive survey-based mental health assessments for Army and DoD. Responsible for staffing and implementing in-theater Mental Health Advisory Teams (MHATs)

Validated psychological resiliency programs

Brain Health, Neuroprotection & Neurorestoration



MISSION:

Reduce death and **the chronic** residual disability caused by brain injury. Focus on improved diagnostics and the discovery of novel therapeutic strategies, and **study mechanisms for restoration of function during chronic states**

PROGRESS:

Identifying **molecular** biomarkers of brain injury and **treatment efficacy**
Developing and evaluating novel neuroprotective and neurorestorative **mechanisms and treatment modalities**



LATBI -- Proposed Solution for Tomorrow



Fixed Facility



Combat Support Hospital



Point of Injury/
Battalion Aid
Station



Phase I: Reference Lab

Advantages

- Accuracy
- Sensitivity
- Precision
- Throughput
- FDA approval
- Flexible platform



Disadvantages

- Size & weight
- Need for sample preparation
- Power and space requirements
- Cost of instrument and assay
- Separate and multiple reagent storage

Phase II: Point-of-care

Advantages

- Smaller size/weight
- No sample prep
- Lower cost
- Assay speed



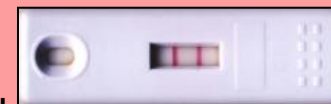
Disadvantages

- Potentially lower sensitivity, accuracy, and/or precision
- No feasibility clinical data
- Time to FDA clearance

Phase III: Handheld

Advantages

- Small size/weight
- Assay speed
- Low cost
- Stable reagents
- Finger-prick sample



Disadvantages

- Lower sensitivity, accuracy, and/or precision
- Time to FDA clearance
- CLIP/CLIA issues for approval

WRAIR Operations in Europe

U. S. Army Medical Research Unit Europe (USAMRU-E) Sembach, Germany



USAMRU-E
Staff of 13
•10 are scientific

- The Army's behavioral health (BH) research asset located with operational units
- Addresses emerging BH issues and develops information products while providing rapid response to senior leaders
- Expertise conducting studies with operational units and complex randomized trials in the field
- 30 year partnership with EUCOM

WRAIR: A Unique National Asset

Leveraging Capacity and Expertise to Serve the Soldier

- **Prominent Infectious Disease and Military Behavioral Health and Neurosciences Research Groups**
 - Only Malaria Drug Discovery/Development Program for the U.S.
 - Close Partnerships with the State Dept, NIAID and private industry
- **Unmatched International capabilities and relationships**
 - OCONUS Research Platforms – Europe, Asia, Africa
 - 6 CONUS and OCONUS CAP-Accredited Diagnostic Labs
 - Clinical Trials Centers on 3 Continents
- **State-of-the-Art Facilities**
 - Pilot Bioproduction Facility—a Strategic DoD Asset
 - AAALAC- Accredited Animal Facilities (US & Thailand)
 - CAP certified and **BSL3 laboratories?????**



Soldier Health

World Health