

## 125 Years of Excellence

WRAIR dates back to 1893 and is the largest, most diverse biomedical research laboratory in the DoD.

WRAIR provides unique research capabilities and innovative medical solutions to a range of force health protection and readiness challenges currently facing U.S. Service Members, along with threats anticipated during future operations.

Through both times of peace and war, infectious diseases have killed, sickened and disabled far more Service Members than bombs and bullets have. WRAIR has created a model of vaccine and therapeutic development that is unique, nimble and responsive to dynamically evolving infectious disease threats of military importance. The Institute, with its unparalleled expertise, facilities and international network, has developed many vaccines and drugs in use today within the military and around the globe.



### Pilot Bioproduction Facility (PBF)

WRAIR's PBF can produce up to 20,000 doses in its new facility (opening early 2019) for pilot studies of vaccines and drugs utilized in pre-clinical and human clinical studies and trials. It is one of only a few facilities that meets FDA and all regulatory standards, including Good Manufacturing Practices. The PBF has manufactured vaccines for dengue, malaria, HIV, Zika, enteric diseases, hepatitis A, plague, and Japanese encephalitis. NIH selected the PBF to produce a new Ebola vaccine candidate based on Rabies.



### Clinical Trials Center

WRAIR's Clinical Trials Center tests new candidate drugs and vaccines to prevent and treat infectious diseases. It is structured for maximum agility, enabling a fast pivot to target and clinically evaluate products that are a top priority to DoD and national security. The center has conducted more than 140 trials composed of 10-14 clinical studies, encompassing more than 7,200 visits annually.



### Insectary

Uniquely developed by WRAIR, the human malaria challenge model enables in-house testing of potential prophylactics, therapeutics, and vaccines. The insectary can produce up to 10,000 mosquitoes each week and deliver malaria-carrying mosquitoes for clinical studies globally. WRAIR has conducted a variety of malaria vaccine studies, including the first and current RTS,S challenge studies.

## A National Resource

### Deployment-related Brain Health

Service Members may experience multiple combat deployments, high operational demands and exposures to blasts or head injury. WRAIR seeks to understand and define the problems faced by deployed service personnel relative to combat exposure and field operations, as well as reintegration into civilian life. WRAIR research has led to innovations in diagnostics, treatment and prevention technologies, and knowledge products that improve the operational environment and medical care for Service Members and remove barriers to care.

### Multidrug-resistant Organism Repository and Surveillance Network (MRSN)

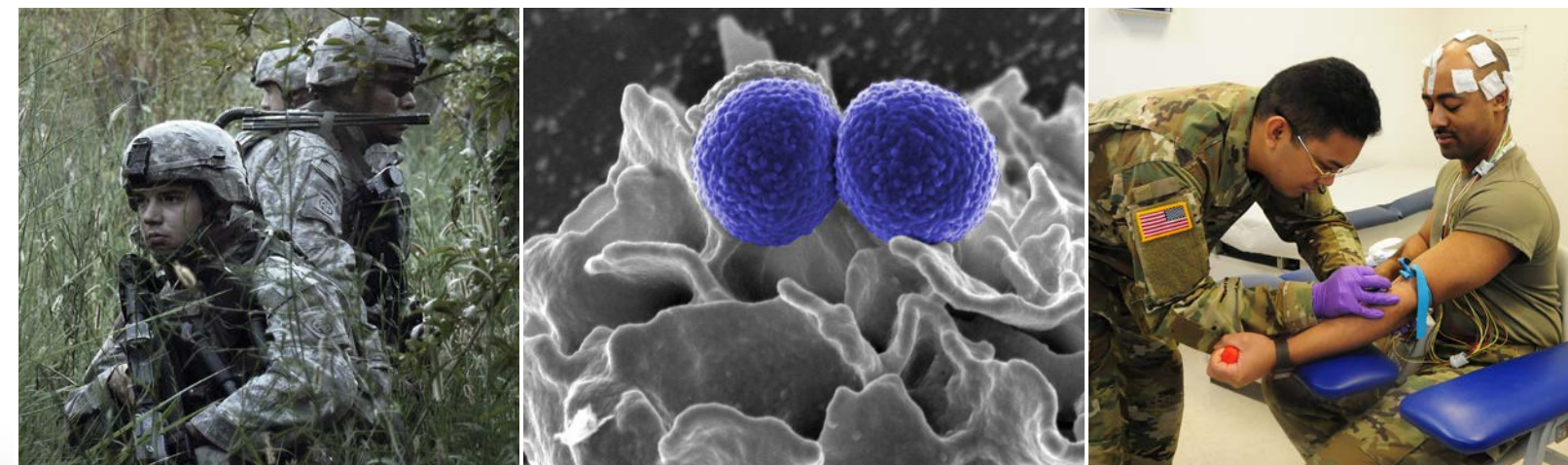
This is the largest, most comprehensive system in the world to identify multidrug-resistant organisms and is recognized by the White House's National Action Plan (NAP) for Combating Antibiotic-Resistant Bacteria. MRSN improves clinical care and patient safety by performing rapid susceptibility testing and whole-genome sequencing of drug-resistant bacteria in infections. This dynamic process changes the course of patient care for healthier outcomes. It also enables enhanced infection control by tracking outbreaks at Army, Navy, Air Force and affiliated hospitals worldwide.

### Developing the Next Generation of Scientists and Physicians

Due to the rapidly aging DoD science, technology, engineering and mathematics (STEM) workforce and the pressing need for more military and civilian physicians, WRAIR created, expanded and adopted education programs to provide a continuum of STEM internships, fellowships and residencies for career development. WRAIR trains about 1000 participants annually. *Web resources: USAEOP.com; sites.nationalacademies.org/pga/rap; orise.orau.gov/stem.*

### Sleep Research Center

WRAIR is a global leader in sleep research and in solutions to maintain operational performance when adequate sleep is not possible. The Institute's sleep suite laboratories offer the infrastructure required to conduct sleep deprivation and intervention studies twenty-four hours a day.



WRAIR's expertise, capabilities and global reach are unmatched. The Institute works extensively with national and international collaborators from industry, pharma, academia, government agencies and nonprofits. WRAIR executes its mission to support U.S. military health and in doing so supports national and global health. Please contact us to learn more.

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**WRAIR** Walter Reed Army  
Institute of Research  
Soldier Health • World Health

Produced by HJF - 3/2019

Solving global health threats by developing leading-edge infectious disease countermeasures and supporting brain health.



# WRAIR

Walter Reed Army  
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## Infectious Diseases

WRAIR is a leader in global efforts against the world's most pervasive and high-impact infectious diseases, including malaria, HIV/AIDS, Ebola and dengue.

Infectious diseases pose a significant and persistent threat to force protection and readiness. While the primary mission of Army medical research is to protect U.S. Service Members and their families, vaccines and treatments developed by Army researchers also benefit global public health.

The WRAIR Center for Infectious Disease Research combines scientific expertise with product development capabilities to prevent the full range of diseases of national security importance to the U.S. military.

### Major steps forward in infectious disease research:

- Led the trial of the first HIV vaccine to demonstrate some protection against infection (RV144) and conducting cure research
- Advanced the first-ever malaria vaccine (in conjunction with GlaxoSmithKline), including Phase III testing overseas and the largest human challenge model at WRAIR
- Developed a Zika Purified Inactivated Virus (ZPIV) vaccine candidate, moving from initial concept to clinical studies within 10 months

## Emerging Infectious Disease Threats

WRAIR's vast research capabilities allow the Institute to quickly pivot to address emerging threats and support outbreak response, such as:

- Advancing vaccines for emerging threats such as MERS, Lassa, Zika and tick-borne encephalitis
- Evaluating several vaccine candidates; six Ebola vaccine studies ongoing or recently completed
- Establishing the Joint West Africa Research Group (JWARG) to help detect and respond to current and future infectious disease threats and improve bio-preparedness in the region

### Some of the WRAIR's enduring contributions to global health include:

#### Diagnostics

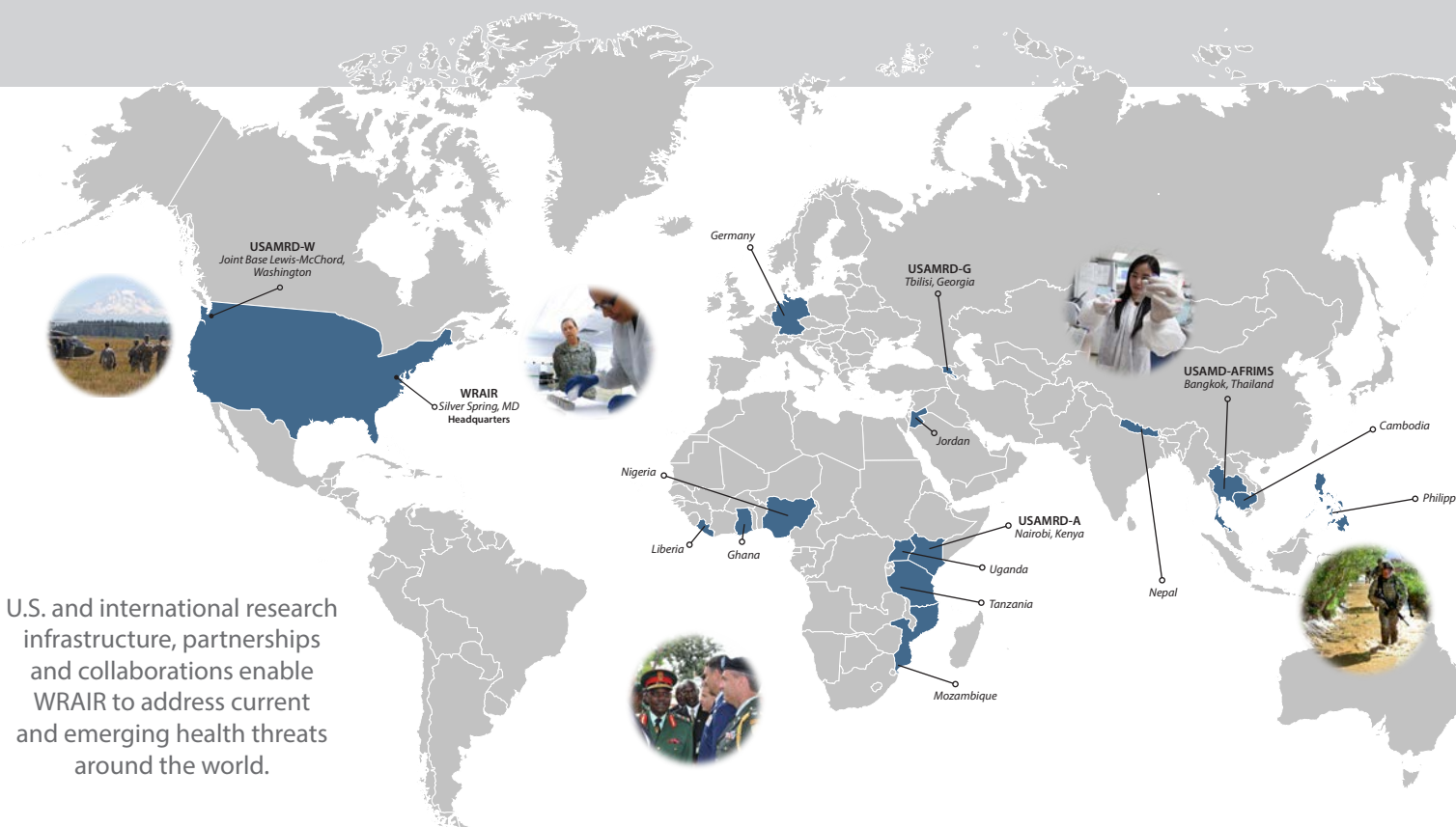
- Developed chikungunya arthropod vector rapid detection device and rapid detection kits for leishmaniasis, dengue and Rift Valley Fever
- Created and deployed the most advanced HIV testing algorithm in the U.S.; now recommended by the U.S. CDC for the U.S. population

#### Protective Vaccines

- Isolated the leading cause of acute respiratory disease (ARD), adenovirus, in 1953, developed a vaccine in 1980 and secured development of a next-generation vaccine in 2011, preventing thousands of cases and lost duty days
- AFRIMS, WRAIR's Thailand unit, supported pivotal efficacy trials for vaccines against hepatitis A, hepatitis E, and Japanese encephalitis

#### Therapeutics

- Took part in the development of all currently used anti-malarial drugs worldwide



U.S. and international research infrastructure, partnerships and collaborations enable WRAIR to address current and emerging health threats around the world.

### International Network

Around the world, WRAIR builds sustainable research infrastructure and long-term partnerships to create products that will ultimately reduce the impact of some of the world's most lethal diseases.

Medical research and products developed at these locations contribute to U.S. military readiness; improve health offerings to the world population; strengthen scientific and medical infrastructure and resources in the host country; and are a major source of global emerging and re-emerging infectious disease surveillance.

With a wide presence in Africa and Asia, and a new unit in the Caucasus region, WRAIR conducts research where the infectious disease threats are greatest.

WRAIR conducts HIV research through the U.S. Military HIV Research Program (MHRP) at satellite sites in Africa, including Nigeria, Tanzania, Uganda and Mozambique. At many of these sites, WRAIR provides prevention and treatment services through the President's Emergency Plan for AIDS Relief (PEPFAR) and also supports the President's Malaria Initiative (PMI).

Such long-standing relationships in host countries continue to foster global health and a uniquely effective type of diplomacy – medical diplomacy.

WRAIR and its international network have enabled many medical advances:

- Led the first HIV vaccine trial (RV144) to show efficacy
- Isolated the virus that causes Rift Valley Fever
- Demonstrated efficacy of Malarone, primaquine and weekly tafenoquine to treat and prevent malaria
- Validated paromomycin/gentamicin cream is effective for cutaneous leishmaniasis



## Brain Health and Performance

### Center for Military Psychiatry and Neuroscience

WRAIR conducts basic and applied research that promotes psychological resilience, enhances neurological functioning and improves operational readiness among U.S. Service Members. By using a continuum of research from basic science to applied field studies, WRAIR creates innovative solutions to enhance Service Members' resilience and recovery.

Research in military psychiatry and neuroscience has been an integral part of the Institute for more than 70 years. WRAIR researchers are recognized leaders in operational medical research for the military in a number of fields, including brain trauma, blast exposure, deployment stressors and sleep restriction and deprivation with an aim to:

- Understand and improve behavioral health and well-being of active duty personnel and their dependents across the deployment cycle
- Sustain alertness, performance and resilience in the military operational environment
- Prevent, diagnose and treat mild to severe traumatic brain injuries (TBI)
- Develop evidence-based strategies to mitigate the effects of blast/trauma-induced brain injury that may be combined with blood loss and other traumas

WRAIR's Center for Military Psychiatry and Neuroscience develops evidence-based strategies to diagnose, prevent and mitigate the psychological demands of war, continuous operations and brain trauma associated with military service. In addition to developing knowledge products to inform policy and training, the Center's notable contributions include:

- Deployment Resilience Training
- Behavioral health assessments across the deployment cycle
- Laboratory assays to accurately diagnose TBI in the lab, point-of-care and potential field devices
- Development and testing of therapeutic agents in adult patients with acute mild TBI and blast-induced TBI
- Multifaceted characterization of caffeine performance effects during sleep loss
- Identification of "sleep banking" and its use to safeguard Soldier health

