



USAMRDC is leading research efforts to **Prevent, Detect, and Treat** COVID-19.

Command laboratories are applying existing field-leading research, a global research network, and established partnerships with industry and academia to support the whole-of-government response to COVID-19.

PREVENT

USAMRDC is executing the research and development of a safe and effective vaccine against COVID-19.



Vaccine Development

- USAMRDC partners with government, academia, and industry to accelerate the most promising vaccine candidates through clinical trials.
- WRAIR is utilizing existing expertise and infrastructure to develop a novel vaccine that is advancing through the research stages to test for safety and effectiveness.
- Vaccine candidates will be tested at USAMRIID and WRAIR, where scientists are developing the animal models necessary to assess the effectiveness of potential drugs and vaccines against COVID-19.
- Successful drug candidates will also be tested in humans at WRAIR's Clinical Trials Center.

Monoclonal Antibodies

- Man-made proteins are being developed to optimize the body's natural response to fight infection.

Protective Equipment

- USAARL is performing rapid testing and Airworthiness Release evaluations on medical devices needed to transport COVID-19-positive patients.
- USAMMDA established the USAMRDC Additive Manufacturing Working Group (AM WG), which offers unique regulatory, legal, programmatic, and clinical expertise for the production of personal protective equipment and other medical devices needed to address critical supply shortages.

DETECT

USAMRDC is collaborating to quickly identify and support diagnostic testing capabilities to facilitate force health protection against COVID-19.

Diagnostics

- WRAIR and USAMRIID are creating a series of tests to include high-throughput confirmatory, clearance assays to assist with return-to-duty recommendations, immunoassays to detect COVID-19 antibodies, and portable point-of-care, rapid detection devices to quickly detect the virus during the early stages of infection.
- USAMRDC is also assisting with the production of medical devices, such as 3D-printed swabs.



Wearables

- USARIEM is evaluating the use of technologies and wearable systems to detect key early symptoms and fever.

TREAT

USAMRDC is focused on developing safe, effective, and accessible treatments for those infected with COVID-19.



Therapeutics

- USAMRDC entered into a Cooperative Research and Development Agreement with Gilead Sciences to provide remdesivir to exposed DoD personnel.
- Researchers are collaborating with industry partners on drug discovery using cutting-edge artificial intelligence and machine learning techniques and screening small molecules for novel therapeutics.

Convalescent Plasma

- Researchers are evaluating the potential of using plasma from convalescent donors in the treatment of COVID-19.

Treatment Logistics

- TATRC is collaborating to develop a virtual National Emergency Telecritical Care Network to rapidly prototype and deploy digital health platforms in global emergency situations.
- In coordination with Army logistics, medical equipment shortages for deploying units are being filled.

USAMRDC COVID-19 Effort Details and Progress

USAMRDC offers the capability and capacity to accelerate the development of a COVID-19 vaccine and improve testing and treatments. These efforts are supported by numerous Command offices and organizations, all focused on public health and ensuring that all research strictly conforms to all safety and regulatory guidance to combat COVID-19.



USAARL: U.S. Army Aeromedical Research Laboratory

USAISR: U.S. Army Institute of Surgical Research

USAMMDA: U.S. Army Medical Materiel Development Activity

USAMRAA: U.S. Army Medical Research Acquisition Activity

USAMRICD: U.S. Army Medical Research Institute of Chemical Defense

USAMRIID: U.S. Army Medical Research Institute of Infectious Diseases

USARIEM: U.S. Army Research Institute of Environmental Medicine

WRAIR: Walter Reed Army Institute of Research

TATRC: Telemedicine and Advanced Technology Research Center

CDMRP: Congressionally Directed Medical Research Programs

Vaccine Development

- WRAIR produced the most detailed atomic-level view of the SARS-CoV-2 spike protein receptor binding domain, which is the part of the virus that binds to the lungs. This has been critical to vaccine discovery and development efforts, as it provides a resource map for the field in rationale vaccine design.
- USAMRDC is in full support of Operation Warp Speed, a coordinating effort to accelerate COVID-19 vaccine development.
- WRAIR down-selected a vaccine candidate from multiple prototypes based on an approach that has shown promise for other respiratory viruses, such as influenza.
- USAMRIID is performing foundational studies to establish validated small and large animal models for testing not only WRAIR's vaccine candidate but multiple vaccines and therapeutics in development. Animal efficacy testing will be done in parallel with human safety testing to accelerate vaccine development efforts.
- Phase I clinical trials for WRAIR's vaccine candidate remain on track to start screening potential human subjects in July, with the goal of starting vaccinations in September 2020 to evaluate the safety of the candidate vaccine.
- The Command is also partnering with government, academia, and industry to identify opportunities to leverage USAMRDC's full range of vaccine development competencies in support of accelerating the most promising vaccine candidates.

Testing

- Researchers are developing tests to diagnose symptomatic individuals, screen for immune status in training and operational settings, and utilize in medical countermeasure clinical trials.
- USAMRDC experts are advising the White House COVID-19 Task Force on the development of a national strategy for high-throughput genetic and antibody testing.
- WRAIR is developing tests to confirm virus clearance, which will inform critical return-to-duty or continued isolation decisions.
- WRAIR, USAMRIID, and industry partners are developing and evaluating immunoassays to help determine (1) who is immune and whether their antibody responses are protective, (2) who is not immune and may be at risk of infection (these are good volunteers for vaccine trials), and (3) who has sufficient antibody levels for their blood to be used for treatment (i.e., convalescent plasma).
- WRAIR is evaluating relevant antibodies for use in a rapid test device for identification of acute SARS-CoV-2 infection in austere, far-forward military environments. The goal is a portable field device with the ability to detect the virus during early stages of infection.
- The USAMRDC AM WG is coordinating the developmental testing and certification of masks to support Emergency Use Authorization (EUA) applications to the FDA.

Expanded Access Treatment Protocols

- USAMMDA is leading an expanded access treatment protocol for DoD personnel with moderate to severe COVID-19 regarding the use of remdesivir, Gilead Sciences' investigational drug, which has broad spectrum activity against an array of viruses and recently received EUA status. Remdesivir was previously investigated by the DoD for activity against Ebola.
- USAMRDC is also leading an expanded access Investigational New Drug treatment protocol using convalescent plasma to treat DoD personnel, beneficiaries, and eligible civilians diagnosed with severe or life-threatening COVID-19.

For more information

Visit the USAMRDC website at: <https://mrdc.amedd.army.mil>

