



Biomedical Advanced Research and Development Authority

The **Biomedical Advanced Research and Development Authority (BARDA)** is a U.S. Department of Health and Human Services (HHS) office responsible for the procurement and development of medical countermeasures, principally against bioterrorism, including chemical, biological, radiological and nuclear (CBRN) threats, as well as pandemic influenza and emerging diseases.^{[1]:140} BARDA was established in 2006 through the Pandemic and All-Hazards Preparedness Act (PAHPA) and reports to the Office of the Assistant Secretary for Preparedness and Response (ASPR). The office manages Project BioShield, which funds the research, development and stockpiling of vaccines and treatments that the government could use during public health emergencies such as chemical, biological, radiological or nuclear (CBRN) attacks.^{[1]:140}

In addition to preparing and maintaining bioterrorism responses and countermeasures, HHS, through the ASPR and BARDA, prepares and maintains an integrated system of medical countermeasures for both known or unknown, and re-emerging or novel types of public health emergencies. These include diagnostic tools, therapeutics, such as antibiotics and antivirals, and preventative measures, such as vaccines. BARDA is an established, official interface between the U.S. federal government and the biomedical industry.^{[1]:267} BARDA also participates in the governmental inter-agency Public Health Emergency Medical Countermeasures Enterprise (PHEMCE), providing coordination across the US federal government in developing and deploying such countermeasures.^{[1]:267}

BARDA works with the biomedical industry, using grants and other assistance, to promote advanced research, innovation and the development of medical devices, tests, vaccines and therapeutics. BARDA also procures and

Biomedical Advanced Research and Development Authority



Agency overview

Formed	December 2006
Jurisdiction	<u>Federal Government of the United States</u>
Headquarters	<u>Hubert H. Humphrey Building</u> , Washington, D.C.
Employees	150
Annual budget	\$1.6 billion <u>USD</u> (2020)
Agency executive	Gary Disbrow, Acting Director
Parent agency	<u>Office of the Assistant Secretary for Preparedness and Response</u>
Website	<u>www.medicalcountermeasures.gov/barda</u> (<u>https://www.medicalcountermeasures.gov/barda</u>)

maintains stockpiles of materials, such as drugs, personal protective equipment (PPE) and vaccines, for the Strategic National Stockpile (SNS).^[2]

History

Creation and legislative history

BARDA was created and authorized by Title IV Sec 401 of the Pandemic and All-Hazards Preparedness Act (PAHPA) of 2006. PAHPA amended the Public Health Service Act by the addition of section 319L to that law.^[3] PAHPA provided new authorities for a number of programs to counter CBRN as well as epidemic, pandemic and emerging disease threats, established the position of Assistant Secretary for Preparedness and Response (ASPR) as well as BARDA reporting to the ASPR, and built on Project BioShield, previously created in 2004.

PAHPA reauthorized the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, following the 2001 anthrax attacks ensuing the September 11, 2001 terrorist attacks on the United States. BARDA was reauthorized by the Pandemic and All-Hazards Preparedness Reauthorization Act of 2013 (PAHPRA) and again in the Pandemic and All-Hazards Preparedness and Advancing Innovation Act of 2019 (PAHPAI).

Leadership

The inaugural director of BARDA, from its inception in 2006 through April 2008 was Carol D. Linden, who served both as the principal deputy director and acting director. From April 2008 through November 14, 2016, the director was Robin A. Robinson, formerly director of the BARDA Influenza and Emerging Diseases division.^[4] He was succeeded as director by Rick Bright from November 15, 2016 through April 20, 2020, when he was moved in what later became a whistleblower controversy during the COVID-19 pandemic in the United States (SARS-CoV-2).^[5] As of April 23, 2020, Gary Disbrow is the BARDA director, formerly director of the Medical Countermeasures program and director of the CBRN division at BARDA. All early BARDA directors also concurrently served as Deputy Assistant Secretary for Preparedness and Response.

Organizational structure

BARDA's 2011–2016 Strategic plan described its composition as the Office of the Director plus seven functional divisions:^[6]

- Chemical, Biological, Radiological and Nuclear Countermeasures (CBRN) Countermeasures
- Clinical Studies
- Influenza
- Manufacturing Facilities and Engineering
- Modeling
- Regulatory and Quality Affairs
- Strategic Science and Technology

In June 2018, BARDA announced a new initiative, its Division of Research Innovation and Ventures (DRIVE).^[7] DRIVE is a business accelerator to fund and support the development of a portfolio of healthcare products.

Roles and purpose

BARDA plays a unique and unusual role within the structure of the US Federal Government, assisting in getting drugs, deemed essential during public health emergencies including attacks compromising US national security, to market. Such assistance ranges from direct funding, procuring and stockpiling medical countermeasures (MCM's), to helping obtain US FDA approvals, including Emergency Use Authorization (EUA) if needed. By the rare nature of such public health emergencies, the required therapies or countermeasures, while critical during the emergency, may not constitute a financially viable or profitable investment, for sufficiently large pharmaceutical companies.

Such gaps in the US government medical countermeasures infrastructure have been described as "bridging the valley of death".^{[8][6]} In this respect, BARDA provides services similar to those offered by venture capitalists or business accelerators in private industry, although BARDA takes no financial stake in the final product once approved by the FDA.^[9]

BARDA acts in concert with the PHEMCE. These activities (see below) include:

- Setting Requirements for Medical Countermeasures (MCM's)
- Funding Advanced Research and Development (ADR) for CBRN and pandemic MCM's
- Administration of National Biodefense Fund(s)
- Promoting Innovation in Development and Manufacturing
- Acquiring and Maintaining MCM Stockpiles

Budget

During public health emergencies, BARDA's budget may be increased by additional congressional appropriations.

In FY 2020, the annual budget of BARDA was approximately \$1.6 billion depending on the precise allocation of costs, including the costs of projects overseen or managed by BARDA on behalf of the ASPR.^{[10][11][12]} The proposed budget in FY 2020, not reflecting any additional congressional appropriations due to the COVID-19 crisis, was an increase from \$1.27 billion in FY 2019, and \$1.02 billion in FY 2018. This figure included \$512 million in medical countermeasures including \$192 million for combating antibiotic-resistant bacteria^[13] and \$260 million USD for advanced research and development (ARD).

Major initiatives

- Research and development

- Medical countermeasures^[14]
 - Vaccines
 - Antimicrobial drugs
 - Therapeutic products
 - Diagnostics
 - Non-pharmaceutical medical supplies
- Stockpiling programs (see below)
 - Project BioShield^[15]
 - Pandemic Influenza Emergency Supplemental Fund
 - Strategic National Stockpile^[16]
 - Antibiotics
 - Vaccines
 - Anthrax vaccine
 - Antidotes
 - Medical equipment and supplies
- Manufacturing infrastructure

Setting requirements

BARDA sets the requirements for medical countermeasures in order to reduce the threats of public health emergencies such as pandemic influenza, CBRN threats, and emerging diseases. The requirements formalize the minimum standards private industry needs to use in order to produce medical countermeasures acceptable to BARDA.

Formulation

Stakeholders across the federal government and the Public Health Emergency Medical Countermeasures Enterprise (PHEMCE) specify requirements. Once established, these requirements drive BARDA's advanced research and development, as well as acquisition. Requirements are created consistent with the planning and prioritization expressed in the HHS PHEMCE Implementation Plan for CBRN Threats. ^[17]

Pandemic influenza

Pandemic Influenza requirements are defined by strategic objectives established in the "National Strategy for Pandemic Influenza"^[18] and the "HHS Pandemic Influenza Plan".^[19]

Advanced research and development

Overview

One of BARDA's major objectives is the creation of a robust and dynamic pipeline of medical countermeasures through advanced research and development (ARD). Its goal is to provide multiple product candidates in each program to both account for attrition in medical countermeasure deployment and to establish multi-product/multi-manufacturer portfolios for sustainability and redundancy.

BARDA medical countermeasures include vaccines, antimicrobial drugs, therapeutic products, diagnostics and non-pharmaceutical medical supplies, as well as devices for public health medical emergencies including chemical, biological, radiological, and nuclear threats (CBRN), pandemic influenza (PI) and emerging infectious diseases (EID).^[20]

Influenza and emerging infectious diseases

One of BARDA's key activities includes the Influenza and Emerging Infectious Diseases Division.^[21] This program aims to support the advanced development of vaccines, therapeutic and diagnostic medical countermeasures that address emerging infectious disease threats.

Nerve agents

Nerve agents and other chemical weapons are a priority for fighting CBRN threats. VX gas, which was the nerve agent that reportedly killed the half-brother of North Korean leader Kim Jong-un, Provides an example. BARDA also stockpiles an anti-seizure medication, midazolam, developed by Meridian Medical Technologies, to be made available in an autoinjector to treat the effects of nerve agents on the neurological system.^[22]

Research into substitute medical countermeasures (MCM) against nerve agents conducted by BARDA has shown the utility of current atropine solutions used in limited quantities in the treatment of cholinergic pathologies, to promote dilation of the eye, or organophosphate poisoning. Noting the lack of sufficient stocks in the case of mass-casualty situations, citing the 1995 Tokyo subway sarin attack, the study proposed alternate routes of administration (ROI) for atropine. The bioavailability of atropine via alternate ROIs was proven to be effective, though consideration was placed on expansion of atropine stockpiles and the dispersion of MCMs to local entities.^[23]

Antibiotic resistant bacteria

In October 2017 BARDA entered a nine-month \$12-million contract with the San Francisco-based biopharmaceutical company Achaogen, sponsoring late-stage development of C-scape, an antibiotic used against resistant bacteria and a potential treatment against weaponized strains of

bacteria.^{[24][25][26]} In April 2019, Achaogen declared bankrupt.^[27]

Stockpile programs

The Pandemic and All-Hazards Preparedness Act (PAHPA) established BARDA as the focal point within HHS for the advanced development and acquisition of medical countermeasures to protect the American civilian population against Chemical, Biological, Radiological, and Nuclear (CBRN) and naturally occurring threats to public health.

BARDA's stockpiling efforts are focused on building reserves of critical countermeasures as they emerge from Advanced Development. Stockpiling contributes to preparedness in two ways:

1. Stockpiled medical countermeasures directly support readiness, as the stockpiled products can help to mitigate the effects of an event or outbreak.
2. Establishment of the stockpile helps to ready suppliers to meet the increased demands that an event will bring about, becoming practiced in the production and delivery of products.

BARDA's acquisitions for the stockpile are not one-time events, complete upon the approval/licensure of a product. Rather, programs are structured to include incremental milestone acquisitions during late stage development, to make available products still in development that may increase preparedness in an event, pending Emergency Use Authorization. Furthermore, we aim to establish stockpiling milestones to address long-term commitments post-licensure.

CBRN stockpile programs

In FY 2004, the US Congress appropriated \$5.6 billion USD to the Project BioShield Special Reserve Fund (SRF) to support the Project BioShield goal of acquiring CBRN medical countermeasures over a 10-year period. BARDA used these funds to support acquisition programs for the procurement of medical countermeasures against high priority CBRN threats. The agency gives funds to pharmaceutical companies to develop countermeasures.^[22] As of January 2020, BARDA had helped obtain FDA approval for at least 50 products.^{[28][29]}

Pandemic influenza stockpile programs

Using funds from the Pandemic Influenza Emergency Supplemental Fund, BARDA is leading the nation toward the vaccine and antiviral stockpile goals for preparedness for pandemic influenza.

In December 2019, BARDA awarded a \$226 million USD six-year contract to Sanofi Pasteur, a global pharmaceutical company with U.S. headquarters in Bridgewater, New Jersey, to increase production capacity for an influenza vaccine. In September 2019, a US presidential executive order required the US government to modernize influenza vaccines and technologies in order to improve national health security.^[30]

Strategic national stockpile

The Public Health Security and Bioterrorism Preparedness Act of 2002 directed the Secretary of Health and Human Services to develop and maintain a Strategic National Stockpile (SNS). The mission of the SNS is to provide for the emergency health security of the United States in the event of a terrorist attack or any other public health emergency.^[31]

The SNS is the largest US national supply of pharmaceuticals and medical supplies for use in a small outbreak to a large-scale, multiple-threat emergency. When state, local, tribal, and/or territorial responders request federal assistance to support their response efforts, the stockpile is used to ensure that supplies are available when and where needed.^[32] The SNS is Intended to contains enough vaccines, antimicrobial drugs, therapeutic products, and non-pharmaceutical medical supplies in the wake of any public health emergency including terrorist attacks whether chemical, biological, radiological, and/or nuclear, as well as pandemic influenza and emerging infectious diseases.^[33]

Emergent BioSolutions manufactures the only FDA licensed vaccine against anthrax disease, called BioThrax, which is recommended by the CDC as a post-exposure prophylactic for anthrax infection.^[34]

As part of a \$450 million contract with BARDA for the SNS, Emergent also developed the only FDA-licensed botulinum antitoxin, Heptavalent Botulism Antitoxin (BAT) for treating naturally occurring botulism.^[v] Canada also approved BAT.^[35]

The US federal government approved a plan against CBRN threats after the 2001 anthrax letters attack, at the time the worst biological attack in United States history.^[22]

BARDA also invested in the late stage development of a product called NuThrax developed by Emergent Biosolutions, which makes the other anthrax vaccine, BioThrax. According to *Homeland Preparedness News*, NuThrax will be able to provide immunity to anthrax after two doses, versus the three doses under the currently stockpiled vaccine (BioThrax).^[22]

Manufacturing and building infrastructure

Ensuring the availability of medical countermeasures for public health emergencies is central to BARDA's mission. This includes ensuring that manufacturing infrastructure is sufficient to support the production of required products, in a manner that is timely, reliable and cost effective.

BARDA has taken multiple approaches to bringing online the necessary infrastructure for medical countermeasure manufacturing; it supports the construction of new facilities as well as retrofitting existing facilities for maximal capacity and flexibility. It has also explored the use of multi-product manufacturing facilities to provide flexibility and surge capacity and enable rapidly providing countermeasures in the dosage forms required for use in the field. BARDa has also established a

network of formulation/fill-finish manufacturers for emergency production and distribution. BARDA has also explored the creation of centers of excellence for the development and production of non-commercial products with assistance from industry partners. ^[36] ^[37]

Advancing innovation

PAHPA charges BARDA to support innovation to reduce the time and cost of medical countermeasures and product advanced research and development. This was to be accomplished through development of technologies that assist the advanced development of countermeasures, investment in research tools and technologies, and research to promote strategic initiatives including rapid diagnostics, broad spectrum antimicrobials, and vaccine manufacturing technologies. PAHPAI provided further authorities for BARDA to promote innovation through industry assistance and partnerships.

BARDA has taken this innovation mandate as an opportunity to work with its partners (including NIH, DoD, CDC, industry, and academia) to create new ways to “make medical countermeasure better.” Examples of this approach to innovation could include the development of animal models to support efficacy testing, immune modulation and other broad-spectrum approaches, immunity assessment, and analytical (potency) assays.

A cited example of BARDA’s approach to innovation from the Pandemic Influenza program is BARDA’s “Mix and Match” study, assessing various combinations of antigens and adjuvants to obtain a more robust immune response.^[38] BARDA has stated plans to support similar initiatives, leveraging technology platforms and products from multiple companies. For example, PAHPA provided an “antitrust” authority that BARDA has used to facilitate cooperation between companies for whom such cooperation would otherwise be difficult to accomplish.

Fujifilm Corporation announced in April 2017 that it would invest \$130 million to increase production capacity for its BioCDMO division. The division “focuses on contract development & manufacturing for biologics.”^[39] Fujifilm Diosynth Biotechnologies, with help from a BARDA grant, invested around \$93 million to build a production facility in the US state of Texas. The facility would include “mammalian cell culture bioreactors” and was planned to open operations at the start of 2018.^[39]

In April 2017, Switzerland-based Basilea Pharmaceutica and the Food and Drug Administration reached an agreement regarding two phase 3 clinical studies of an antibiotic developed by Basilea, ceftobiprole. The two clinical studies would examine ceftobiprole for the treatment of “Staphylococcus aureus bacteremia (bloodstream infections) and acute bacterial skin and skin structure infections.”^[40] Basilea signed a contract with BARDA, which it entered into in 2016 for the clinical phase 3 development of the antibiotic. BARDA provided initial funding of \$20 million but could provide up to \$100 million over a period of 4–5 years.^[40]

In 2017, BARDA signed a three-year \$8.1 million contract with InBios International, Inc. of Seattle, Washington to develop a “point-of-care diagnostic test that may be able to determine within 15 minutes whether a patient has been infected with the bacterium that causes anthrax.”^[41]

In September 2017, BARDA awarded Velico Medical \$15.5 million for development of a technology that uses spray drying of human plasma for transfusions. The current industry standard is to freeze plasma. Frozen plasma can take 40 or more minutes to defrost and deliver.^[42] According to Fierce Biotech, “Velico has Spray Dried Plasma technology (SpDPTM) that enables the storage of blood as dry powder, rather than the typical freezing, for subsequent rehydration. It's expected to be useful in hospital emergency rooms, operating suites and intensive care units--as well as in a military or field hospital setting.”^[43]

In July 2005, at the hearings before the Committee on Health, Education, Labor, and Pensions, the first CEO and Director of the center, Tara O'Toole, MD, MPH, has pointed to center's role as the "BioDARPA" (i.e. "biomedical DARPA").^{[44][45]}

Pandemic and emerging disease responses

Anthrax

Since the 2001 anthrax attacks in the United States, BARDA has supported the research and development ^[46] of diagnostics, therapeutics and vaccines for anthrax. Therapeutics include the antibiotics XERAVA Of Tetraphase Pharmaceuticals, ZEMDRI of Achaogen (rights ex-Greater China bought by Cipla USA) Gepotidacin of GlaxoSmithKline and SPR994 of Spero Therapeutics. In July 2018, Spero was jointly awarded ^[47] up to USD \$54 million by BARDA and the Defense Threat Reduction Agency (DTRA), in support of SPR994 development. SPR994 also has application to the treatment of multi-drug resistant (MDR) bacteria.

BARDA also supported the development of the antitoxins Anthrasil of Cangene (March 2015 FDA approval) and Anthim of Elusys Therapeutics (March 2016 FDA approval). Anthrax vaccines whose development was supported by BARDA include BioThrax (AVA), AV7909 of Emergent BioSolutions Px563L of Pfenex and NasoShield of Altimmune.

Botulism

Botulism is caused by the botulinum toxin, one of the deadliest known toxins. While the bacteria that cause botulism ^[48] ^[49] occur naturally, botulism outbreaks are considered rare and unlikely by the US CDC, except as the result of a bioterrorism attack. BARDA maintains a supply of botulism antitoxins through the Strategic National Stockpile (SNS).

COVID-19

As of June, seven companies had been chosen for funding from Operation Warp Speed to expedite development and preparation for manufacturing their respective vaccine candidates: Johnson & Johnson (Janssen Pharmaceutical), AstraZeneca-University of Oxford, Pfizer-BioNTech, Moderna, Merck, Vaxart, and Inovio.^{[50][51]} Funding from BARDA totaled more than \$2 billion by the end of June, with the largest awards of \$1.2 billion given to AstraZeneca and \$483 million to Moderna.^[50]

In June 2020, BARDA and the U.S. Department of Defense signed a \$143 million contract with SiO2 Materials Science to ramp up production of vials and syringes used for COVID drugs and vaccines.^[52]

Ebola

After the 2014 West Africa Ebola virus epidemic (followed by the Kivu Ebola epidemic starting in 2018), BARDA supported the development of the first Ebola vaccine, ERVEBO, by BioProtection Systems, a subsidiary of NewLink Genetics Inc. (now Lumos Pharma). The vaccine was announced^[53] by the ASPR on December 19, 2019; ERVEBO,^[54] a vaccine for the Zaire ebola virus was licensed from NewLink Genetics in 2014 and produced and taken to market by Merck. It was successfully used in the 2018 Ebola virus epidemic in the Democratic Republic of the Congo (DRC).

Influenza

Smallpox

Smallpox is a highly contagious, potentially fatal disease caused by the Variola virus. While the US discontinued immunization in 1972, and it was declared eradicated^[55] ^[56] by the World Health Organization (WHO) in 1980 (the last known naturally occurring case was seen in 1977, in Somalia), it is still considered a potent bioterrorism threat. BARDA began stockpiling smallpox vaccines in 2010.^[57] ^[58] By 2018, BARDA had procured millions of doses of TPOXX, of SIGA Technologies, by then the first (and only) FDA-approved^[59] antiviral smallpox drug therapy, for the SNS.^[60] In 2019, BARDA announced a partnership with BioFactura to develop a second therapeutic, a monoclonal antibody smallpox treatment.^[61]

Zika

As of early 2020, there were no publicly acknowledged BARDA biomedical collaborations (diagnostics, therapies or vaccines) for the Zika virus. However BARDA has an announced (general) four-part Zika strategy^[62]

- Prevention (vaccines)
- Detection (diagnostics)
- Ensuring a safe blood supply (screening)

- National Countermeasure Response Activation (developer assistance)

Medical countermeasure portfolio

Threat	Product	Development Stage
Smallpox	TPOXX (SIGA Technologies) ^[63]	Procured
Botulism	Botulism therapeutic product	Procured
Anthrax	Nuthrax (Emergent Biosolutions)	Late stage development and procurement (2017)
Anthrax	BioThrax (Emergent Biosolutions)	Stockpiled
Ebola virus	Ebola therapeutic and Ebola vaccine	Late stage development (2017)
Nerve agents (such as VX)	Midazolam in an autoinjector (Meridian Medical Technologies)	Preparing to stockpile (2017)
Mustard gas	In process (2017)	Future development
Chlorine gas	In process (2017)	Future development
Improvised nuclear device or dirty bomb	Cytokine products	Procured
Burn injuries	Silverlon, a metallic silver-based antimicrobial wound dressing (Argentum Medical)	Stockpiled

Table source:^[22]

Integrated national biodefense medical countermeasures portfolio

The Department of Defense (DoD) and HHS each identify medical countermeasure requirements to address their different missions and focus. DoD's focus is on protecting the armed forces prior to exposure, whereas HHS's focus is on response to threats to the civilian population after exposure in a CBRN event.

However, there are areas of common requirements or interest where medical countermeasure candidates, resources and information can be appropriately shared to maximize opportunities for success in the development of medical countermeasures for the highest priority threats. BARDA, in partnership with other HHS and DoD partners, is leading an Integrated National Biodefense Medical Countermeasure Portfolio to leverage resources and programs across the agencies that develop and acquire CBRN medical countermeasures to more effectively address the broad range of common threats and requirements. Members of this Integrated Portfolio include BARDA, biodefense programs

in the National Institute of Allergy and Infectious Diseases (NIAID), which also oversees all biodefense activities across the other Institutes of the National Institutes of Health (NIH), and multiple elements of the DoD Chemical and Biological Defense Program.

Controversies

On April 20, 2020, during the COVID-19 pandemic in the United States, in an action that led to the filing of a US whistleblower complaint and testimony before the US House of Representatives,^{[64][65]} Rick Bright was asked to step down as Director of BARDA. Bright claimed he had been removed from his post because he had insisted that “the billions of dollars allocated by Congress to address the COVID-19 pandemic” be invested “into safe and scientifically vetted solutions, and not in drugs, vaccines and other technologies that lack scientific merit.”^[66] Bright was reassigned to the National Institutes of Health (NIH). The Assistant Secretary for Preparedness and Response (ASPR) at the time, who was implicated in the complaint, was Robert Kadlec.

On January 27, 2021, the U.S. Office of Special Counsel transmitted an investigative report to President Biden confirming whistleblower allegations that ASPR “misappropriated millions of dollars that Congress appropriated for [BARDA] to respond to public health emergencies like outbreaks of Ebola, Zika, and—now—COVID-19.”^{[67][68]}

The investigation by the HHS Office of Inspector General (OIG) substantiated whistleblower claims that “ASPR did not always comply with Federal fiscal law when managing BARDA appropriations.”^[69] In his transmittal letter, Special Counsel Henry Kerner wrote the President that he was “deeply concerned about ASPR’s apparent misuse of millions of dollars in funding meant for public health emergencies like the one our country is currently facing with the COVID-19 pandemic. Equally concerning is how widespread and well-known this practice appeared to be for nearly a decade.”

See also

- Advanced Research Projects Agency for Health (ARPA-H)
- Public Health Security and Bioterrorism Preparedness and Response Act (H.R.3448, 107th Congress; Public Law 107-188) - original 2002 law revised and extended by PAHPA
- Pandemic and All-Hazards Preparedness Act (PAHPA) (S.3678, 109th Congress; Public Law 109-417) - 2006 law (PAHPA) authorizing BARDA
- Pandemic and All-Hazards Preparedness Reauthorization Act of 2013 (PAHPRA) (H.R. 307, 113th Congress; Public Law 113-5) - 2013 law reauthorizing BARDA
- Pandemic and All-Hazards Preparedness and Advancing Innovation Act (PAHPAI Act) (S.1379, 116th Congress; Public Law 116-22) - 2019 law reauthorizing BARDA

References

1. Kraft, Michael; Marks, Edward (2016). U.S. Government Counterterrorism: A Guide to Who Does What (<https://books.google.com/books?id=1anMBQAAQBAJ>). Boca Raton, Florida: CRC Press.

ISBN 9781439851470. OCLC 635488871 (<https://www.worldcat.org/oclc/635488871>) – via Google Books.

2. " "Strategic National Stockpile" " (<https://www.phe.gov/about/sns/Pages/default.aspx>). *www.phe.gov*. Archived (<https://web.archive.org/web/20200403134414/https://www.phe.gov/about/sns/Pages/default.aspx>) from the original on April 3, 2020. Retrieved May 21, 2020.
3. "42 USC 241: Research and investigations generally" ([https://uscode.house.gov/view.xhtml?req=\(title:42%20section:241%20edition:prelim\)%20OR%20\(granuleid:USC-prelim-title42-section241\)&f=treesort&edition=prelim&num=0&jumpTo=true](https://uscode.house.gov/view.xhtml?req=(title:42%20section:241%20edition:prelim)%20OR%20(granuleid:USC-prelim-title42-section241)&f=treesort&edition=prelim&num=0&jumpTo=true)). *uscode.house.gov*.
4. " "Robin Robinson named First Director of BARDA" " (<http://www.biopharminternational.com/robin-robinson-named-first-director-barda>). *www.biopharminternational.com*. May 8, 2008. Archived (<https://web.archive.org/web/20200613113420/http://www.biopharminternational.com/robin-robinson-named-first-director-barda>) from the original on June 13, 2020. Retrieved May 22, 2020.
5. " "Rick Bright Selected as New BARDA Director" " (<https://globalbiodefense.com/2016/11/15/rick-bright-selected-new-barda-director/>). *www.globalbiodefense.com*. November 15, 2016. Retrieved May 22, 2020.
6. " "BARDA Strategic Plan 2011-2016" " (<https://web.archive.org/web/20200522014432/https://www.phe.gov/about/barda/stratplan/Pages/introduction.aspx>). *www.phe.gov*. Archived from the original (<https://www.phe.gov/about/barda/stratplan/Pages/introduction.aspx>) on May 22, 2020. Retrieved May 22, 2020.
7. " "HHS launches new initiative to address health concerns as national security threats" " (<https://www.fiercehealthcare.com/regulatory/departments-health-and-human-services-drive-security-barda>). *www.fiercehealthcare.com*. June 5, 2018. Archived (<https://web.archive.org/web/20200613124308/https://www.fiercehealthcare.com/regulatory/departments-health-and-human-services-drive-security-barda>) from the original on June 13, 2020. Retrieved May 23, 2020.
8. " "BARDA's Vision, Mission and Values" " (<https://web.archive.org/web/20131012183904/http://www.phe.gov/about/barda/stratplan/Pages/barda-vision-mission-and-values.aspx>). *www.phe.gov*. Archived from the original (<https://www.phe.gov/about/barda/stratplan/Pages/barda-vision-mission-and-values.aspx>) on October 12, 2013. Retrieved May 23, 2020.
9. "BARDA: The venture capital firm buried in the US government" (<https://www.marketplace.org/2014/10/30/barda-venture-capital-firm-buried-us-government/>). *www.marketplace.org*. October 30, 2014. Archived (<https://web.archive.org/web/20200613113313/https://www.marketplace.org/2014/10/30/barda-venture-capital-firm-buried-us-government/>) from the original on June 13, 2020. Retrieved May 23, 2020.
10. "Fiscal Year 2018 Budget-In-Brief Public Health and Social Services Emergency Fund" (<https://www.phe.gov/about/aspr/Documents/BIB-2018.pdf>) (PDF). *Office of the Assistant Secretary for Preparedness and Response*. U.S. Department of Health and Human Services. Retrieved May 22, 2020.
11. "Fiscal Year 2019 Budget-In-Brief Public Health and Social Services Emergency Fund" (<https://web.archive.org/web/20200417155833/https://www.phe.gov/about/aspr/Documents/BIB-2019.pdf>) (PDF). *Office of the Assistant Secretary for Preparedness and Response*. U.S. Department of Health and Human Services. Archived from the original (<https://www.phe.gov/about/aspr/Documents/BIB-2019.pdf>) (PDF) on April 17, 2020. Retrieved May 22, 2020.
12. " "Fiscal Year 2020 Budget-In-Brief Public Health and Social Services Emergency Fund" (<https://www.phe.gov/about/aspr/Documents/BIB-2020.pdf>) (PDF). *Office of the Assistant Secretary for Preparedness and Response*. U.S. Department of Health and Human Services. Retrieved May 22, 2020.

13. "The Role of the Biomedical Advanced Research and Development Authority Authority BARDA in Promoting Innovation in Antibacterial Product Development" (<https://www.resistancecontrol.info/2017/the-role-of-the-biomedical-advanced-research-and-development-authority-barda--in-promoting-innovation-in-antibacterial-product-development/>). *www.resistancecontrol.info*. Retrieved May 25, 2020.
14. "Goals and strategies" (<https://web.archive.org/web/20201028210634/https://www.phe.gov/about/barda/stratplan/Pages/goals-and-strategies.aspx>). *Public Health Emergency, U.S. Department of Health and Human Services*. Archived from the original (<https://www.phe.gov/about/barda/stratplan/Pages/goals-and-strategies.aspx>) on 2020-10-28. Retrieved 2020-10-25.
15. "MedicalCountermeasures.gov - Home" (<https://www.medicalcountermeasures.gov/barda/cbrn/project-bioshield-overview/>). *www.medicalcountermeasures.gov*. Archived (<https://web.archive.org/web/20201020015424/https://medicalcountermeasures.gov/barda/cbrn/project-bioshield-overview/>) from the original on 2020-10-20. Retrieved 2020-10-25.
16. "Strategic National Stockpile" (<https://www.phe.gov/about/sns/Pages/default.aspx>). *Public Health Emergency, U.S. Department of Health and Human Services*. Archived (<https://web.archive.org/web/20200403134414/https://www.phe.gov/about/sns/Pages/default.aspx>) from the original on 2020-04-03. Retrieved 2020-10-25.
17. "HHS PHEMCE Strategy and Implementation Plan" (<https://web.archive.org/web/20111015054930/https://www.medicalcountermeasures.gov/BARDA/PHEMCE/enterprise/strategy/strategy.aspx>). *MedicalCountermeasures.gov*. U.S. Department of Health & Human Services. Archived from the original (<https://www.medicalcountermeasures.gov/BARDA/PHEMCE/enterprise/strategy/strategy.aspx>) on 15 October 2011.
18. Homeland Security Council (November 2005). "National Strategy for Pandemic Influenza" (<http://www.flu.gov/professional/federal/pandemic-influenza.pdf>) (PDF). *Flu.gov*. U.S. Department of Health & Human Services. Archived (<https://web.archive.org/web/20111108152451/http://www.flu.gov/professional/federal/pandemic-influenza.pdf>) (PDF) from the original on 8 November 2011. Retrieved 1 October 2016.
19. "HHS Pandemic Influenza Plan" (<https://web.archive.org/web/20120302132121/http://www.hhs.gov/pandemicflu/plan/>). *HHS.gov*. U.S. Department of Health & Human Services. Archived from the original (<https://www.hhs.gov/pandemicflu/plan/>) on 2 March 2012.
20. "BARDA Strategic Plan 2011-2016" (<https://web.archive.org/web/20200318060414/https://www.phe.gov/about/barda/Documents/barda-strategic-plan.pdf>) (PDF). *U.S. Department of Health and Human Services*. Archived from the original (<https://www.phe.gov/about/barda/Documents/barda-strategic-plan.pdf>) (PDF) on 2020-03-18. Retrieved 2019-11-13.
21. "MedicalCountermeasures.gov" (<https://www.medicalcountermeasures.gov/barda/influenza-and-emerging-infectious-diseases/>). *www.medicalcountermeasures.gov*. Archived (<https://web.archive.org/web/20201028214849/https://www.medicalcountermeasures.gov/barda/influenza-and-emerging-infectious-diseases/>) from the original on 2020-10-28. Retrieved 2020-10-25.
22. "With some biological threats mitigated, BARDA shifts focus to combat highly pathogenic viruses, chemical agents" (<https://homelandprepnews.com/stories/21394-biological-threats-mitigated-barda-shifts-focus-combat-highly-pathogenic-viruses-chemical-agents/>). *Homeland Preparedness News*. 2017-03-06. Archived (<https://web.archive.org/web/20191225164233/https://homelandprepnews.com/stories/21394-biological-threats-mitigated-barda-shifts-focus-combat-highly-pathogenic-viruses-chemical-agents/>) from the original on 2019-12-25. Retrieved 2017-03-14.

23. Schwartz, Michael D.; Raulli, Robert; Laney, Judith W.; Coley, William; Walker, Robert; O'Rourke, Anna W.; Raine, Kathryn; Horwith, Gary; Gao, Yonghong; Eisnor, Derek L.; Lu, Di; Wolling, Brenda; David, Gloria; Johnson, Keli; Barry, William T. (July 2022). "Systemic Bioavailability of Sublingual Atropine Ophthalmic Solution: a Phase I Study in Healthy Volunteers with Implications for Use as a Contingency Medical Countermeasure" (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9198126>). *Journal of Medical Toxicology*. **18** (3): 187–197. doi:10.1007/s13181-021-00873-0 (<https://doi.org/10.1007/s13181-021-00873-0>). ISSN 1937-6995 (<https://www.worldcat.org/issn/1937-6995>). PMC 9198126 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9198126>). PMID 35312968 (<https://pubmed.ncbi.nlm.nih.gov/35312968>).
24. "HHS Sponsors Development of Antibiotic-Resistant, Anti-Biowarfare Antibiotic" (<http://www.biopharminternational.com/hhs-sponsors-development-antibiotic-resistant-anti-biowarfare-antibiotic>). *biopharminternational.com*. 11 October 2017. Archived (<https://web.archive.org/web/20171222051603/http://www.biopharminternational.com/hhs-sponsors-development-antibiotic-resistant-anti-biowarfare-antibiotic>) from the original on 2017-12-22. Retrieved 2017-12-20.
25. "News Release - PHE" (<https://www.phe.gov/Preparedness/news/Pages/biowarfare-treatment.aspx>). *phe.gov*. Archived (<https://web.archive.org/web/20171222050855/https://www.phe.gov/Preparedness/news/Pages/biowarfare-treatment.aspx>) from the original on 2017-12-22. Retrieved 2017-12-20.
26. "BARDA, Achaogen partner to develop antibiotic to combat infections from drug resistant bacteria" (<https://homelandprepnews.com/stories/24697-barda-achaogen-partner-develop-antibiotic-combat-infections-drug-resistant-bacteria/>). *Homeland Preparedness News*. 2017-10-12. Archived (<https://web.archive.org/web/20190305082846/https://homelandprepnews.com/stories/24697-barda-achaogen-partner-develop-antibiotic-combat-infections-drug-resistant-bacteria/>) from the original on 2019-03-05. Retrieved 2017-12-20.
27. Jacobs, Andrew (25 December 2019). "Crisis Looms in Antibiotics as Drug Makers Go Bankrupt" (<https://www.nytimes.com/2019/12/25/health/antibiotics-new-resistance.html>). *The New York Times*. Archived (<https://web.archive.org/web/20210201230345/https://www.nytimes.com/2019/12/25/health/antibiotics-new-resistance.html>) from the original on 1 February 2021. Retrieved 23 November 2022.
28. "ASPR Blog" (<https://web.archive.org/web/20200613155411/https://www.phe.gov/ASPRBlog/pages/BlogArticlePage.aspx?PostID=362>). *www.phe.gov*. October 11, 2019. Archived from the original (<https://www.phe.gov/ASPRBlog/pages/BlogArticlePage.aspx?PostID=362>) on June 13, 2020. Retrieved May 19, 2020.
29. "51 FDA Approved Medical Countermeasures Backed by BARDA" (<https://globalbiodefense.com/2020/01/12/50-fda-approved-medical-countermeasures-backed-by-barda/>). *www.globalbiodefense.com*. January 12, 2020. Archived (<https://web.archive.org/web/20200518231020/https://globalbiodefense.com/2020/01/12/50-fda-approved-medical-countermeasures-backed-by-barda/>) from the original on May 18, 2020. Retrieved May 21, 2020.
30. "Pandemic Influenza Vaccine: HHS awards Sanofi Pasteur \$226 million contract" (<http://outbreaknewstoday.com/pandemic-influenza-vaccine-hhs-awards-sanofi-pasteur-226-million-contract-36021/>). *Outbreak News Today*. 2019-12-10. Retrieved 2019-12-10.
31. *The Strategic National Stockpile: Origin, Policy Foundations, and Federal Context* (<https://www.ncbi.nlm.nih.gov/books/NBK396378/>). National Academies Press (US). 2016-10-24. Archived (<https://web.archive.org/web/20200507135802/https://www.ncbi.nlm.nih.gov/books/NBK396378/>) from the original on 2020-05-07. Retrieved 2017-01-19.
32. "Strategic National Stockpile | PHPR" (<https://www.cdc.gov/phpr/stockpile/>). *cdc.gov*. Archived (<https://web.archive.org/web/20170131190602/https://www.cdc.gov/phpr/stockpile/>) from the original on 2017-01-31. Retrieved 2017-01-19.

33. "Inside A Secret Government Warehouse Prepped For Health Catastrophes" (<https://www.npr.org/sections/health-shots/2016/06/27/483069862/inside-a-secret-government-warehouse-prepped-for-health-catastrophes>). *NPR.org*. Archived (<https://web.archive.org/web/20210818204816/https://www.npr.org/sections/health-shots/2016/06/27/483069862/inside-a-secret-government-warehouse-prepped-for-health-catastrophes>) from the original on 2021-08-18. Retrieved 2017-01-19.
34. "1 And HPA Announce Botulinum Vaccine Collaboration" (<http://www.biospace.com/News/1-and-hpa-announce-botulinum-vaccine-collaboration/18703220>). *biospace.com*. Retrieved 2017-01-19.
35. "Health Canada approves Emergent BioSolutions' botulism antitoxin" (<https://homelandprepnews.com/stories/20437-health-canada-approves-emergent-biosolutions-botulism-antitoxin/>). *Homeland Preparedness News*. 2016-12-13. Retrieved 2017-01-19.
36. "HHS Awards \$6 million to Create Pediatric Disaster Care Centers of Excellence" (<https://www.phe.gov/Preparedness/news/Pages/pdcc-award-30sept19.aspx>). *www.phe.gov*. September 30, 2019. Retrieved May 23, 2020.
37. "Sanofi Awarded \$226 million by US Government to Expand Pandemic Influenza Preparedness" (<http://www.news.sanofi.us/2019-12-09-Sanofi-awarded-226-million-by-US-government-to-expand-pandemic-influenza-preparedness>). *www.news.sanofi.us*. December 9, 2019. Archived (<https://web.archive.org/web/20200602174825/http://www.news.sanofi.us/2019-12-09-Sanofi-awarded-226-million-by-US-government-to-expand-pandemic-influenza-preparedness>) from the original on June 2, 2020. Retrieved May 23, 2020.
38. World Health Organization. (2010). Proceedings of the ninth global vaccine research forum and parallel satellite symposia (http://apps.who.int/iris/bitstream/10665/70637/1/WHO_IVB_10.13_eng.pdf): Bamako, Mali 6–9 December 2009.
39. "Fujifilm expands biopharma facilities in US & UK with \$ 130 mn investment" (http://www.business-standard.com/content/b2b-pharma/fujifilm-expands-biopharma-facilities-in-us-uk-with-130-mn-investment-117042400362_1.html). *Business Standard India*. 2017-04-24. Archived (https://web.archive.org/web/20170426151411/http://www.business-standard.com/content/b2b-pharma/fujifilm-expands-biopharma-facilities-in-us-uk-with-130-mn-investment-117042400362_1.html) from the original on 2017-04-26. Retrieved 2017-04-25.
40. "Basilea announces agreement with FDA on Special Protocol Assessments for antibiotic ceftobiprole phase 3 clinical studies in bloodstream and skin infections" (<https://finance.yahoo.com/news/basilea-announces-agreement-fda-special-051802737.html>). *Yahoo Finance*. 2017-04-21. Retrieved 2017-04-25.
41. "Anthrax: HHS advances point-of-care diagnostic test - Outbreak News Today" (<http://outbreaknewstoday.com/anthrax-hhs-advances-point-care-diagnostic-test-60967/>). *Outbreak News Today*. 2017-09-26. Archived (<https://web.archive.org/web/20171002070410/http://outbreaknewstoday.com/anthrax-hhs-advances-point-care-diagnostic-test-60967/>) from the original on 2017-10-02. Retrieved 2017-10-01.
42. "Velico Medical Announces a Further \$18.9m BARDA Funding for Spray Dried Alternative to Frozen Plasma" (https://www.prweb.com/releases/velico_medical_announces_a_further_18_9m_barda_funding_for_spray_dried_alternative_to_frozen_plasma/prweb14735224.htm). *PRWeb*. Retrieved 2017-10-01.
43. "Startup Velico nabs another \$15.5M from BARDA for dried plasma tech | FierceBiotech" (<http://www.fiercebiotech.com/medical-devices/startup-velico-nabs-another-15-5m-from-barda-for-dried-plasma-tech>). *fiercebiotech.com*. 11 September 2015. Archived (<https://web.archive.org/web/20171002022231/http://www.fiercebiotech.com/medical-devices/startup-velico-nabs-another-15-5m-from-barda-for-dried-plasma-tech>) from the original on 2017-10-02. Retrieved 2017-10-01.

44. Hearing before the Committee On Health, Education, Labor, And Pensions United States Senate, One Hundred Ninth Congress (<https://www.gpo.gov/fdsys/pkg/CHRG-109shrg28743/html/CHRG-109shrg28743.htm>) Archived (<https://web.archive.org/web/20180220033604/https://www.gpo.gov/fdsys/pkg/CHRG-109shrg28743/html/CHRG-109shrg28743.htm>) 2018-02-20 at the [Wayback Machine](#) (July 14, 2005). U.S. Government Printing Office, Washington : 2007
45. Klabukov, Ilya (2017). "The BioDARPA Concept" (<https://ssrn.com/abstract=2951926>). *SSRN Electronic Journal*.
46. " "BARDA's Anthrax Medical Countermeasure Strategy and Portfolio" " (<https://web.archive.org/web/20200521124932/https://www.phe.gov/about/barda/anthrax/Pages/default.aspx>). *www.phe.gov*. Archived from the original (<https://www.phe.gov/about/barda/anthrax/Pages/default.aspx>) on May 21, 2020. Retrieved May 21, 2020.
47. " "Spero awarded up to \$54 million by BARDA and DTRA to Support SPR994 Development" " (<https://web.archive.org/web/20200613160148/https://investors.sperotherapeutics.com/news-releases/news-release-details/spero-awarded-54-million-barda-and-dtra-support-spr994>). *www.investors.sperotherapeutics.com*. July 16, 2018. Archived from the original (<https://investors.sperotherapeutics.com/news-releases/news-release-details/spero-awarded-54-million-barda-and-dtra-support-spr994>) on June 13, 2020. Retrieved May 22, 2020.
48. " "Botulism" " (<https://www.cdc.gov/botulism/index.html>). *www.cdc.gov*. 19 August 2019. Archived (<https://web.archive.org/web/20230111041341/https://www.cdc.gov/botulism/index.html>) from the original on 11 January 2023. Retrieved May 21, 2020.
49. " "Botulism" " (<https://www.who.int/news-room/fact-sheets/detail/botulism>). *www.who.int*. Archived (<https://web.archive.org/web/20190323162924/https://www.who.int/news-room/fact-sheets/detail/botulism>) from the original on March 23, 2019. Retrieved May 21, 2020.
50. "Vaxart oral COVID-19 vaccine joins Trump's "Warp Speed," ramps up manufacturing capacity" (<https://www.genengnews.com/news/vaxart-oral-covid-19-vaccine-joins-trumps-warp-speed-ramps-up-manufacturing-capacity/>). Genetic Engineering and Biotechnology News. 2020-06-29. Archived (<https://web.archive.org/web/20200929213736/https://www.genengnews.com/news/vaxart-oral-covid-19-vaccine-joins-trumps-warp-speed-ramps-up-manufacturing-capacity/>) from the original on 2020-09-29. Retrieved 2020-07-01.
51. "INOVIO Reports Positive Interim Phase I Data for COVID-19 DNA Vaccine, Joins "Warp Speed" Primate Study" (<https://www.genengnews.com/news/inovio-reports-positive-interim-phase-i-data-for-covid-19-dna-vaccine-joins-warp-speed-primate-study/>). Genetic Engineering and Biotechnology News. 2020-06-30. Archived (<https://web.archive.org/web/20201001233159/https://www.genengnews.com/news/inovio-reports-positive-interim-phase-i-data-for-covid-19-dna-vaccine-joins-warp-speed-primate-study/>) from the original on 2020-10-01. Retrieved 2020-07-01.
52. "SiO2 Materials Science Receives \$143 Million Contract from U.S. Government to Accelerate Capacity Scale-Up of Advanced Primary Packaging Platform for COVID-19 Vaccines and Therapeutics" (<https://www.businesswire.com/news/home/20200608005120/en/SiO2-Materials-Science-Receives-143-Million-Contract>). *www.businesswire.com*. 2020-06-08. Archived (<https://web.archive.org/web/20200609065625/https://www.businesswire.com/news/home/20200608005120/en/SiO2-Materials-Science-Receives-143-Million-Contract>) from the original on 2020-06-09. Retrieved 2020-06-09.
53. " "ASPR Blog" " (<https://web.archive.org/web/20200514114927/https://www.phe.gov/ASPRBlog/pages/BlogArticlePage.aspx?PostID=370>). *www.phe.gov*. December 19, 2019. Archived from the original (<https://www.phe.gov/ASPRBlog/Pages/BlogArticlePage.aspx?PostID=370>) on May 14, 2020. Retrieved May 21, 2020.

54. " "Merck announces FDA Approval for ERVEBO (Ebola Zaire vaccine, Live)" " (<https://investors.merck.com/news/press-release-details/2019/Merck-Announces-FDA-Approval-for-ERVEBO-Ebola-Zaire-Vaccine-Live/default.aspx>). *www.investors.merck.com*. December 20, 2019. Retrieved May 21, 2020.
55. " "Smallpox" " (<https://www.who.int/csr/disease/smallpox/en/>). *www.who.int*. Archived (<https://web.archive.org/web/20070922184729/http://www.who.int/csr/disease/smallpox/en/>) from the original on September 22, 2007. Retrieved May 22, 2020.
56. " "Smallpox Eradication Program" " (<https://web.archive.org/web/20100518163719/http://www.who.int/features/2010/smallpox/en/>). *www.who.int*. Archived from the original (<https://www.who.int/features/2010/smallpox/en/>) on May 18, 2010. Retrieved May 22, 2020.
57. " "HHS Blog" " (<https://www.hhs.gov/blog/2019/09/24/newly-fda-licensed-vaccine-prevention-smallpox-marks-milestone-global-health-security.html>). *www.hhs.gov*. September 24, 2019. Archived (<https://web.archive.org/web/20210117003938/https://www.hhs.gov/blog/2019/09/24/newly-fda-licensed-vaccine-prevention-smallpox-marks-milestone-global-health-security.html>) from the original on January 17, 2021. Retrieved May 22, 2020.
58. " "HHS Purchases Smallpox Vaccine to Enhance Biodefense Preparedness" " (<https://www.hhs.gov/about/news/2019/09/03/hhs-purchases-smallpox-vaccine-to-enhance-biodefense-preparedness.html>). *www.hhs.gov*. September 3, 2019. Archived (<https://web.archive.org/web/20190903184841/https://www.hhs.gov/about/news/2019/09/03/hhs-purchases-smallpox-vaccine-to-enhance-biodefense-preparedness.html>) from the original on September 3, 2019. Retrieved May 23, 2002.
59. " "US Food and Drug Administration Approves SIGA Technologies' TPOXX (tecovirimat) for the Treatment of Smallpox" " (<https://web.archive.org/web/20180921045623/http://investor.siga.com/news-releases/news-release-details/us-food-and-drug-administration-approves-siga-technologies>). *www.investor.siga*. July 13, 2018. Archived from the original (<https://investor.siga.com/news-releases/news-release-details/us-food-and-drug-administration-approves-siga-technologies>) on September 21, 2018. Retrieved May 22, 2020.
60. " "ASPR Blog" " (<https://web.archive.org/web/20200514115114/https://www.phe.gov/ASPRBlog/Lists/Posts/Post.aspx?ID=313>). *www.phe.gov*. July 13, 2018. Archived from the original (<https://www.phe.gov/ASPRBlog/Lists/Posts/Post.aspx?ID=313>) on May 14, 2020. Retrieved May 22, 2020.
61. " "HHS spurs development of smallpox therapeutic to enhance health security" " (<https://www.phe.gov/Preparedness/news/Pages/smallpox-26sept19.aspx>). *www.phe.gov*. September 26, 2019. Archived (<https://web.archive.org/web/20200613112047/https://www.phe.gov/Preparedness/news/Pages/smallpox-26sept19.aspx>) from the original on June 13, 2020. Retrieved May 22, 2020.
62. " "BARDA's Medical Countermeasure Response to Zika" " (<https://web.archive.org/web/20200514114557/https://www.phe.gov/about/barda/zika/Pages/default.aspx>). *www.phe.gov*. Archived from the original (<https://www.phe.gov/about/barda/zika/Pages/default.aspx>) on May 14, 2020. Retrieved May 21, 2020.
63. *in-pharmatechnologist.com* (21 September 2018). "Siga signs \$629m contract with BARDA for smallpox drug stockpiling" (<https://www.in-pharmatechnologist.com/Article/2018/09/21/Siga-signs-629m-multiyear-contract-with-BARDA-for-smallpox-drug-stockpiling>). *in-pharmatechnologist.com*. Retrieved 2019-06-13.
64. " "Coronavirus whistleblower Rick Bright testifies" " (<https://www.cnn.com/politics/live-news/rick-bright-testimony-05-14-20/index.html>). *www.cnn.com*. May 14, 2020. Retrieved May 20, 2020.
65. " "Rick Bright's Full Whistleblower Complaint" " (<https://www.cnn.com/2020/05/05/politics/rick-bright-full-complaint/index.html>). *www.cnn.com*. May 5, 2020. Archived (<https://web.archive.org/web/20200516085542/https://www.cnn.com/2020/05/05/politics/rick-bright-full-complaint/index.html>) from the original on May 16, 2020. Retrieved May 20, 2020.

66. "Top vaccine doctor says his concern about Trump's coronavirus treatment theory led to ouster from federal agency" (<https://www.cnbc.com/2020/04/22/coronavirus-treatment-vaccine-doctor-say-s-worry-about-trump-idea-led-to-ouster.html>). *CNBC*. 22 April 2020. Archived (<https://web.archive.org/web/20210215173920/https://www.cnbc.com/2020/04/22/coronavirus-treatment-vaccine-doctor-says-worry-about-trump-idea-led-to-ouster.html>) from the original on 2021-02-15. Retrieved 2020-04-22.
67. " "HHS Misused Millions of Dollars Intended for Vaccine Research, Emergency Preparedness" " (<https://osc.gov/News/Pages/21-08-HHS-Misused-Millions-Emergency-Preparedness.aspx>). *osc.gov*. January 27, 2021. Retrieved January 28, 2021.
68. " " Millions earmarked for public health emergencies were used to pay for unrelated projects, inspector general says" " (<https://www.washingtonpost.com/health/2021/01/27/barda-health-funds-misappropriated/>). *www.washingtonpost.com*. January 27, 2021. Archived (<https://web.archive.org/web/20210128000258/https://www.washingtonpost.com/health/2021/01/27/barda-health-funds-misappropriated/>) from the original on January 28, 2021. Retrieved January 28, 2021.
69. " "Investigation into the Assistant Secretary for Preparedness and Response for Misuse of Congressional Appropriations, H-18-0-1183-8" " (<https://osc.gov/Documents/Public%20Files/FY21/DI-16-3098/Subject%20Agency%20Report%3b%20DI-16-3098.pdf>) (PDF). *osc.gov*. January 27, 2021. Retrieved January 28, 2021.

External links

- [Official website \(https://www.medicalcountermeasures.gov/\)](https://www.medicalcountermeasures.gov/)
 - [CBRN, BARDA, Project BioShield Overview \(https://www.medicalcountermeasures.gov/barda/cbrn\)](https://www.medicalcountermeasures.gov/barda/cbrn)
 - [Public Health Emergencies \(United States\) - HHS public health emergency website including information on BARDA \(https://www.phe.gov/about/pages/default.aspx\)](https://www.phe.gov/about/pages/default.aspx)
-

Retrieved from "https://en.wikipedia.org/w/index.php?title=Biomedical_Advanced_Research_and_Development_Authority&oldid=1240396639"