To authorize the Department of Energy to conduct collaborative research with the Department of Veterans Affairs in order to improve healthcare services for veterans in the United States, and for other purposes.
SEC. 2. DEFINITIONS.

In this Act:

(1) DEPARTMENT.—The term “Department” means the Department of Energy.

(2) NATIONAL LABORATORY.—The term “National Laboratory” has the meaning given that term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).

(3) SECRETARY.—The term “Secretary” means the Secretary of Energy.

SEC. 3. PURPOSES.

The purposes of this Act are to advance Department of Energy expertise in artificial intelligence and high-performance computing in order to improve health outcomes for veteran populations by—

(1) supporting basic research through the application of artificial intelligence, high-performance computing, modeling and simulation, machine learning, and large-scale data analytics to identify and solve outcome-defined challenges in the health sciences;

(2) maximizing the impact of health and genomics data provided by the Department of Veterans Affairs, as well as other sources, on science, innovation, and healthcare outcomes through the use and advancement of artificial intelligence and high-
performance computing capabilities of the Department of Energy;

(3) promoting collaborative research through the establishment of partnerships to improve data sharing between Federal agencies, National Laboratories, institutions of higher education, and non-profit institutions;

(4) establishing multiple scientific computing user facilities to house and provision available data to foster transformational outcomes; and

(5) driving the development of technology to improve artificial intelligence, high-performance computing, and networking relevant to mission applications of the Department of Energy, including modeling, simulation, machine learning, and advanced data analytics.

SEC. 4. DEPARTMENT OF ENERGY VETERANS HEALTH RESEARCH AND DEVELOPMENT.

(a) IN GENERAL.—The Secretary shall establish and carry out a research program in artificial intelligence and high-performance computing, focused on the development of tools to solve big data challenges associated with veteran’s healthcare, and to support the efforts of the Department of Veterans Affairs to identify potential health risks and challenges utilizing data on long-term health-
care, health risks, and genomic data collected from veteran populations. The Secretary shall carry out this program through a competitive, merit-reviewed process, and consider applications from National Laboratories, institutions of higher education, multi-institutional collaborations, and other appropriate entities.

(b) PROGRAM COMPONENTS.—In carrying out the program established under subsection (a), the Secretary may—

(1) conduct basic research in modeling and simulation, machine learning, large-scale data analytics, and predictive analysis in order to develop novel or optimized algorithms for prediction of disease treatment and recovery;

(2) develop methods to accommodate large data sets with variable quality and scale, and to provide insight and models for complex systems;

(3) develop new approaches and maximize the use of algorithms developed through artificial intelligence, machine learning, data analytics, natural language processing, modeling and simulation, and develop new algorithms suitable for high-performance computing systems and large biomedical data sets;
(4) advance existing and construct new data enclaves capable of securely storing data sets provided by the Department of Veterans Affairs, Department of Defense, and other sources; and

(5) promote collaboration and data sharing between National Laboratories, research entities, and user facilities of the Department by providing the necessary access and secure data transfer capabilities.

(c) COORDINATION.—In carrying out the program required under subsection (a), the Secretary is authorized to—

(1) enter into a memorandum of understanding with the Department of Veterans Affairs and other entities in order to maximize the effectiveness of Department of Energy research and development to improve veterans’ healthcare; and

(2) consult with the Department of Veterans Affairs and other Federal agencies as appropriate.

(d) REPORT.—Not later than two years after the date of the enactment of this Act, the Secretary shall submit to the Committee on Science, Space, and Technology and the Committee on Veterans’ Affairs of the House of Representatives, and the Committee on Energy and Natural

•HR 6398 IH
Resources and the Committee on Veterans’ Affairs of the Senate, a report detailing the effectiveness of—

(1) the interagency coordination between each Federal agency involved in the research program carried out under this section;

(2) collaborative research achievements of the program; and

(3) potential opportunities to expand the technical capabilities of the Department.

(e) **FUNDING.**—The Secretary of Veterans Affairs shall devote $27,000,000 to carry out this section for fiscal years 2019 and 2020, subject to the availability of appropriations, to come from amounts made available for medical and prosthetic research. This section shall be carried out using funds otherwise appropriated by law after the date of enactment of this Act.

**SEC. 5. ARTIFICIAL INTELLIGENCE, DATA ANALYTICS, AND COMPUTATIONAL RESEARCH PILOT PROGRAM.**

(a) **IN GENERAL.**—The Secretary shall carry out a pilot program to develop tools for big data analytics by utilizing data sets generated by Federal agencies, institutions of higher education, nonprofit research organizations, and industry in order to advance artificial intelligence technologies to solve complex, big data challenges.
The Secretary shall carry out this program through a competitive, merit-reviewed process, and consider applications from National Laboratories, institutions of higher education, multi-institutional collaborations, and other appropriate entities.

(b) PROGRAM COMPONENTS.—In carrying out the pilot program established under subsection (a), the Secretary may—

(1) establish a cross-cutting research initiative to prevent duplication and coordinate research efforts in artificial intelligence and data analytics across the Department;

(2) conduct basic research in modeling and simulation, artificial intelligence, machine learning, large-scale data analytics, natural language processing, and predictive analysis in order to develop novel or optimized predictive algorithms suitable for high-performance computing systems and large biomedical data sets;

(3) develop multivariate optimization models to accommodate large data sets with variable quality and scale in order to visualize complex systems;

(4) establish multiple scientific computing user facilities to serve as data enclaves capable of securely storing data sets created by Federal agencies,
institutions of higher education, nonprofit organizations, or industry at National Laboratories; and

(5) promote collaboration and data sharing between National Laboratories, research entities, and user facilities of the Department by providing the necessary access and secure data transfer capabilities.

(c) REPORT.—Not later than two years after the date of the enactment of this Act, the Secretary shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report evaluating the effectiveness of the pilot program under subsection (a), including basic research discoveries achieved in the course of the program and potential opportunities to expand the technical capabilities of the Department through the development of artificial intelligence and data analytics technologies.

(d) FUNDING.—For purposes of carrying out this section, the Secretary of Energy shall devote $52,000,000 to carry out this section, which shall include $26,000,000 for each fiscal years 2019 and 2020, subject to the availability of appropriations. This section shall be carried out using funds otherwise appropriated by law after the date of enactment of this Act.
SEC. 6. SPENDING LIMITATION.

No additional funds are authorized to be appropriated to carry out this Act and the amendments made by this Act, and this Act and such amendments shall be carried out using amounts otherwise available for such purpose.