H. R. 7171

To provide for a coordinated Federal research program to ensure continued United States leadership in engineering biology.

IN THE HOUSE OF REPRESENTATIVES

NOVEMBER 27, 2018

Ms. EDDIE BERNICE JOHNSON of Texas (for herself and Mr. SENSENBRENNER) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

A BILL

To provide for a coordinated Federal research program to ensure continued United States leadership in engineering biology.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the “Engineering Biology Research and Development Act of 2019”.

SECTION 2. FINDINGS.

The Congress makes the following findings:

(1) Cellular and molecular processes may be used, mimicked, or redesigned to develop new prod-
ucts, processes, and systems that improve societal
well-being, strengthen national security, and con-
tribute to the economy.

(2) Engineering biology relies on scientists and
engineers with a diverse and unique set of skills
combining the biological, physical, and information
sciences and engineering.

(3) Long-term research and development is nec-
essary to create breakthroughs in engineering biol-
ogy. Such research and development requires govern-
ment investment as the benefits are too distant or
uncertain for industry to support alone.

(4) The Federal Government can play an im-
portant role by facilitating the development of tools
and technologies to further advance engineering biol-
ogy, including multiple user facilities that the Fed-
eral Government is uniquely able to support.

(5) Since other countries are investing signifi-
cant resources in engineering biology, the United
States is at risk of losing its competitive lead in this
emerging area if it does not invest the necessary re-
sources and have a national strategy.

(6) A National Engineering Biology Initiative
can serve to establish new research directions and
technology goals, improve interagency coordination
and planning processes, drive technology transfer, and help ensure optimal returns on the Federal investment.

SEC. 3. DEFINITIONS.

In this Act—

(1) the term “biomanufacturing” means the manufacturing of products using biological manufacturing technologies;

(2) the term “engineering biology” means the science and engineering of cellular and molecular processes to advance fundamental understanding of complex natural systems, including the microbiome, and to develop new and advance existing products, processes, and systems that will contribute significantly to societal well-being, national security, and the economy;

(3) the term “Program” means the National Engineering Biology Research and Development Program established under section 4.

SEC. 4. NATIONAL ENGINEERING BIOLOGY RESEARCH AND DEVELOPMENT PROGRAM.

(a) IN GENERAL.—The President, acting through the Office of Science and Technology Policy, shall implement a National Engineering Biology Research and Development Program to advance societal well-being, national se-
curity, and economic productivity and competitiveness through—

(1) advancing areas of research at the intersection of the biological, physical, and information sciences and engineering, including research on the microbiome;

(2) supporting social science research that advances the field of engineering biology and contributes to the adoption of new products, processes, and technologies;

(3) expanding the number of researchers, educators, and students with engineering biology training;

(4) accelerating the translation and commercialization of engineering biology research and development by the private sector; and

(5) improving the interagency planning and coordination of Federal Government activities related to engineering biology.

(b) PROGRAM ACTIVITIES.—The activities of the Program shall include—

(1) sustained support for engineering biology research and development through—

(A) grants to individual investigators and interdisciplinary teams of investigators;
(B) projects funded under joint solicita-
tions by a collaboration of no fewer than two
agencies participating in the Program; and

(C) interdisciplinary research centers that
are organized to investigate basic research
questions and carry out technology development
and demonstration activities;

(2) education and training of undergraduate
and graduate students in research at the intersection
of biological, physical, and information sciences and
engineering;

(3) activities to develop robust mechanisms for
tracking and quantifying the outputs and economic
benefits of engineering biology; and

(4) activities to accelerate the translation and
commercialization of new products, processes, and
technologies by—

(A) identifying precompetitive research op-
portunities;

(B) facilitating public-private partnerships
in engineering biology research and develop-
ment;

(C) connecting researchers, graduate stu-
dents, and postdoctoral fellows with entrepre-
neurship education and training opportunities;
and

(D) supporting proof of concept activities
and the formation of startup companies includ-
ing through programs such as the Small Busi-
ness Innovation Research Program and the
Small Business Technology Transfer Program.

(c) EXPANDING PARTICIPATION.—The Program shall
include, to the maximum extent practicable, outreach to
primarily undergraduate and minority-serving institutions
about Program opportunities, and shall encourage the de-
velopment of research collaborations between research-in-
tensive universities and primarily undergraduate and mi-
nority-serving institutions.

(d) ETHICAL, LEGAL, ENVIRONMENTAL, AND SOCI-
etal ISSUES.—Program activities shall take into account
ethical, legal, environmental, and other appropriate soci-
etal issues, including the need for safeguards and moni-
toring systems to protect society against the unintended
release of engineered materials produced, by—

(1) supporting research, including in the social
sciences, and other activities addressing ethical,
legal, environmental, and other appropriate societal
issues related to engineering biology, including inte-
grating research on such topics with the research
and development in engineering biology, and ensuring that the results of such research are widely disseminated, including through interdisciplinary engineering biology research centers described in subsection (b)(1); and

(2) ensuring, through the agencies and departments that participate in the Program, that public input and outreach are integrated into the Program by the convening of regular and ongoing public discussions through mechanisms such as citizen panels, consensus conferences, and educational events, as appropriate.

(e) INTERAGENCY COMMITTEE.—The President, acting through the Office of Science and Technology Policy, shall designate an interagency committee on engineering biology, which shall include representatives from the Office of Science and Technology Policy, the National Science Foundation, the Department of Energy, the National Aeronautics and Space Administration, the National Institute of Standards and Technology, the Environmental Protection Agency, and any other agency that the President considers appropriate (in this section referred to as the “interagency committee”). The Director of the Office of Science and Technology Policy shall select a chairperson from among the members of the Interagency Committee.
The Interagency Committee shall oversee the planning, management, and coordination of the Program. The Interagency Committee shall—

(1) provide for interagency coordination of Federal engineering biology research, development, and other activities undertaken pursuant to the Program;

(2) establish and periodically update goals and priorities for the Program;

(3) develop, not later than 12 months after the date of enactment of this Act, and update every 5 years, a strategic plan that—

(A) guides the activities of the Program for purposes of meeting the goals and priorities established under (and updated pursuant to) paragraph (2); and

(B) describes—

(i) the Program’s support for long-term funding for interdisciplinary engineering biology research and development;

(ii) the Program’s support for education and public outreach activities;

(iii) the Program’s support for research and other activities on ethical, legal, environmental, and other appropriate soci-
etal issues related to engineering biology;
and
(iv) how the Program will move re-
sults out of the laboratory and into appli-
cation for the benefit of society and United
States competitiveness;
(4) propose an annually coordinated interagency
budget for the Program that is intended to ensure—
(A) the maintenance of a robust engineer-
ing biology research and development portfolio;
and
(B) that the balance of funding across the
Program is sufficient to meet the goals and pri-
orities established for the Program;
(5) develop a plan to utilize Federal programs,
such as the Small Business Innovation Research
Program and the Small Business Technology Trans-
fer Program, in support of the activities described in
subsection (b)(4); and
(6) in carrying out this section, take into con-
sideration the recommendations of the advisory com-
mittee established under section 5, the results of the
workshop convened under section 6, existing reports
on related topics, and the views of academic, State,
industry, and other appropriate groups.
(f) **Annual Report.**—The interagency committee established under subsection (e) shall prepare an annual report, to be submitted to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate not later than 90 days after submission of the President’s annual budget request, that includes—

(1) the Program budget for the fiscal year to which such budget request applies, and for the then current fiscal year, including a breakout of spending for each agency participating in the Program, and for the development and acquisition of any research facilities and instrumentation; and

(2) an assessment of how Federal agencies are implementing the plan described in subsection (e)(5), and a description of the amount and number of Small Business Innovation Research and Small Business Technology Transfer awards made in support of the Program.

**SEC. 5. ADVISORY COMMITTEE.**

(a) **In General.**—The President, acting through the Office of Science and Technology Policy, shall designate or establish an advisory committee on engineering biology research and development (in this section referred to as
the “advisory committee”) to be composed of not fewer than 12 members, including representatives of research and academic institutions, industry, and nongovernmental entities, who are qualified to provide advice on the Program.

(b) ASSESSMENT.—The advisory committee shall assess—

(1) progress made in implementing the Program;

(2) the need to revise the Program;

(3) the balance of activities and funding across the Program;

(4) whether the Program priorities and goals developed by the Interagency Committee are helping to maintain United States leadership in engineering biology;

(5) the management, coordination, implementation, and activities of the Program; and

(6) whether ethical, legal, environmental, and other appropriate societal issues are adequately addressed by the Program.

(c) REPORTS.—Beginning not later than 3 years after the date of enactment of this Act, and not less frequently than once every 5 years thereafter, the advisory committee shall submit to the President, the Committee
on Science, Space, and Technology of the House of Rep-
resentatives, and the Committee on Commerce, Science,
and Transportation of the Senate, a report on—

(1) the findings of the advisory committee’s as-
essment under subsection (b); and

(2) the advisory committee’s recommendations
for ways to improve the Program.

(d) Application of Federal Advisory Com-
mittee Act.—Section 14 of the Federal Advisory Com-
mittee Act (5 U.S.C. App.) shall not apply to the Advisory
Committee.

SEC. 6. EXTERNAL REVIEW OF ETHICAL, LEGAL, ENVIRON-
MENTAL, AND SOCIETAL ISSUES.

(a) In General.—Not later than 12 months after
the date of enactment of this Act, the Director of the Na-
tional Science Foundation shall enter into an agreement
with the National Academies to convene a workshop to
review the ethical, legal, environmental, and other appro-
priate societal issues related to engineering biology re-
search and development. The goals of the workshop shall
be to—

(1) assess the current research on such issues;

(2) evaluate the research gaps relating to such
issues; and
(3) provide recommendations on how the Program can address the research needs identified.

(b) REPORT TO CONGRESS.—Not later than 2 years after the date of enactment of this Act, the Director of the National Science Foundation shall transmit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a summary report containing the findings of the workshop convened under this section.

SEC. 7. AGENCY ACTIVITIES.

(a) NATIONAL SCIENCE FOUNDATION.—As part of the Program, the National Science Foundation shall—

(1) support basic research at the intersection of the biological, physical, and information sciences and engineering, including research on the microbiome, through individual grants and through interdisciplinary research centers;

(2) support research on the environmental and social effects of engineering biology;

(3) provide research instrumentation support for engineering biology disciplines; and

(4) award grants, on a competitive basis, to enable institutions to support graduate students and
postdoctoral fellows who perform some of their engineering biology research in an industry setting.

(b) Department of Commerce.—As part of the Program, the Director of the National Institute of Standards and Technology shall—

(1) establish a bioscience research program to advance the development of standard reference materials and measurements and to create new data tools, techniques, and processes necessary to advance engineering biology and biomanufacturing;

(2) provide access to user facilities with advanced or unique equipment, services, materials, and other resources to industry, institutions of higher education, nonprofit organizations, and government agencies to perform research and testing; and

(3) provide technical expertise to inform the development of guidelines and safeguards for new products, processes, and systems of engineering biology.

(e) Department of Energy.—As part of the Program, the Secretary of Energy shall—

(1) conduct and support basic research, development, demonstration, and commercial application activities in engineering biology disciplines, including in the areas of synthetic biology, advanced biofuel
development, biobased materials, and environmental remediation; and

(2) provide access to user facilities with advanced or unique equipment, services, materials, and other resources, as appropriate, to industry, institutions of higher education, nonprofit organizations, and government agencies to perform research and testing.

(d) National Aeronautics and Space Administration.—As part of the Program, the National Aeronautics and Space Administration shall—

(1) conduct and support basic and applied research in engineering biology fields, including in the field of synthetic biology, the microbiome, and related to Earth and space sciences, aeronautics, space technology, and space exploration and experimentation, consistent with the priorities established in the National Academies’ decadal surveys; and

(2) award grants, on a competitive basis, that enable institutions to support graduate students and postdoctoral fellows who perform some of their engineering biology research in an industry setting.

(e) Environmental Protection Agency.—As part of the Program, the Environmental Protection Agen-
cy shall support research on how products, processes, and systems of engineering biology will affect the environment.