

AMENDMENT NO. \_\_\_\_\_ Calendar No. \_\_\_\_\_

Purpose: In the nature of a substitute.

**IN THE SENATE OF THE UNITED STATES—116th Cong., 2d Sess.**

**S. 3734**

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

Referred to the Committee on \_\_\_\_\_ and  
ordered to be printed

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AMENDMENT IN THE NATURE OF A SUBSTITUTE intended  
to be proposed by Mr. MARKEY

Viz:

1 Strike all after the enacting clause and insert the fol-

2 lowing:

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Bioeconomy Research

5 and Development Act of 2020”.

6 **SEC. 2. FINDINGS.**

7 The Congress makes the following findings:

8 (1) Cellular and molecular processes may be

9 used, mimicked, or redesigned to develop new prod-

10 ucts, processes, and systems that improve societal

1 well-being, strengthen national security, and con-  
2 tribute to the economy.

3 (2) Engineering biology relies on a workforce  
4 with a diverse and unique set of skills combining the  
5 biological, physical, chemical, and information  
6 sciences and engineering.

7 (3) Long-term research and development is nec-  
8 essary to create breakthroughs in engineering biol-  
9 ogy. Such research and development requires govern-  
10 ment investment as many of the benefits are too dis-  
11 tant or uncertain for industry to support alone.

12 (4) Research is necessary to inform evidence-  
13 based governance of engineering biology and to sup-  
14 port the growth of the engineering biology industry.

15 (5) The Federal Government has an obligation  
16 to ensure that ethical, legal, environmental, safety,  
17 security, and societal implications of its science and  
18 technology research and investment follows policies  
19 of responsible innovation and fosters public trans-  
20 parency.

21 (6) The Federal Government can play an im-  
22 portant role by facilitating the development of tools  
23 and technologies to further advance engineering biol-  
24 ogy, including user facilities, by facilitating public-  
25 private partnerships, by supporting risk research,

1 and by facilitating the commercial application in the  
2 United States of research funded by the Federal  
3 Government.

4 (7) The United States led the development of  
5 the science and engineering techniques that created  
6 the field of engineering biology, but due to increas-  
7 ing international competition, the United States is  
8 at risk of losing its competitive advantage if it does  
9 not strategically invest the necessary resources.

10 (8) A National Engineering Biology Initiative  
11 can serve to establish new research directions and  
12 technology goals, improve interagency coordination  
13 and planning processes, drive technology transfer to  
14 the private sector, and help ensure optimal returns  
15 on the Federal investment.

16 **SEC. 3. DEFINITIONS.**

17 In this Act:

18 (1) **BIOMANUFACTURING.**—The term “bio-  
19 manufacturing” means the utilization of biological  
20 systems to develop new and advance existing prod-  
21 ucts, tools, and processes at commercial scale.

22 (2) **ENGINEERING BIOLOGY.**—The term “engi-  
23 neering biology” means the application of engineer-  
24 ing design principles and practices to biological sys-  
25 tems, including molecular and cellular systems, to

1 advance fundamental understanding of complex nat-  
2 ural systems and to enable novel or optimize func-  
3 tions and capabilities.

4 (3) INITIATIVE.—The term “Initiative” means  
5 the National Engineering Biology Research and De-  
6 velopment Initiative established under section 4.

7 (4) OMICS.—The term “omics” refers to the  
8 collective technologies used to explore the roles, rela-  
9 tionships, and actions of the various types of mol-  
10 ecules that make up the cells of an organism.

11 **SEC. 4. NATIONAL ENGINEERING BIOLOGY RESEARCH AND**  
12 **DEVELOPMENT INITIATIVE.**

13 (a) IN GENERAL.—The President, acting through the  
14 Office of Science and Technology Policy, shall implement  
15 a National Engineering Biology Research and Develop-  
16 ment Initiative to advance societal well-being, national se-  
17 curity, sustainability, and economic productivity and com-  
18 petitiveness through—

19 (1) advancing areas of research at the intersec-  
20 tion of the biological, physical, chemical, data, and  
21 computational sciences and engineering to accelerate  
22 scientific understanding and technological innovation  
23 in engineering biology;

1           (2) advancing areas of biomanufacturing re-  
2           search to optimize, standardize, scale, and deliver  
3           new products and solutions;

4           (3) supporting social and behavioral sciences  
5           and economics research that advances the field of  
6           engineering biology and contributes to the develop-  
7           ment and public understanding of new products,  
8           processes, and technologies;

9           (4) improving the understanding of engineering  
10          biology of the scientific and lay public and sup-  
11          porting greater evidence-based public discourse  
12          about its benefits and risks;

13          (5) supporting risk research, including under  
14          subsection (d);

15          (6) supporting the development of novel tools  
16          and technologies to accelerate scientific under-  
17          standing and technological innovation in engineering  
18          biology;

19          (7) expanding the number of researchers, edu-  
20          cators, and students and a retooled workforce with  
21          engineering biology training, including from tradi-  
22          tionally underrepresented and underserved popu-  
23          lations;

1           (8) accelerating the translation and commer-  
2           cialization of engineering biology research and devel-  
3           opment by the private sector; and

4           (9) improving the interagency planning and co-  
5           ordination of Federal Government activities related  
6           to engineering biology.

7           (b) INITIATIVE ACTIVITIES.—The activities of the  
8 Initiative shall include—

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

11           (A) grants to individual investigators and  
12          teams of investigators, including interdiscipli-  
13          nary teams;

14           (B) projects funded under joint sollicita-  
15          tions by a collaboration of no fewer than two  
16          agencies participating in the Initiative; and

17           (C) interdisciplinary research centers that  
18          are organized to investigate basic research  
19          questions, carry out technology development  
20          and demonstration activities, and increase un-  
21          derstanding of how to scale up engineering biol-  
22          ogy processes, including biomanufacturing;

23          (2) sustained support for databases and related  
24          tools, including—

1           (A) support for curated genomics,  
2           epigenomics, and all other relevant omics data-  
3           bases, including plant and microbial databases,  
4           that are available to researchers to carry out  
5           engineering biology research;

6           (B) development of standards for such  
7           databases, including for curation, interoper-  
8           ability, and protection of privacy and security;

9           (C) support for the development of com-  
10          putational tools, including artificial intelligence  
11          tools, that can accelerate research and innova-  
12          tion using such databases; and

13          (D) an inventory and assessment of all  
14          Federal government omics databases to identify  
15          opportunities for consolidation and inform in-  
16          vestment in such databases as critical infra-  
17          structure for the engineering biology research  
18          enterprise;

19          (3) sustained support for the development, opti-  
20          mization, and validation of novel tools and tech-  
21          nologies to enable the dynamic study of molecular  
22          processes in situ, including through—

23                 (A) research conducted at Federal labora-  
24                 tories;

1 (B) grants to investigators at institutions  
2 of higher education and other nonprofit re-  
3 search institutions;

4 (C) incentivized development of retooled in-  
5 dustrial sites across the country that foster a  
6 pivot to modernized engineering biology initia-  
7 tives; and

8 (D) through the Small Business Innovation  
9 Research Program and the Small Business  
10 Technology Transfer Program, as described in  
11 section 9 of the Small Business Act (15 U.S.C.  
12 638);

13 (4) education and training of undergraduate  
14 and graduate students in engineering biology, bio-  
15 manufacturing, bioprocess engineering, and com-  
16 putational science applied to engineering biology and  
17 in the related ethical, legal, environmental, safety,  
18 security, and other societal domains;

19 (5) activities to develop robust mechanisms for  
20 tracking and quantifying the outputs and economic  
21 benefits of engineering biology; and

22 (6) activities to accelerate the translation and  
23 commercialization of new products, processes, and  
24 technologies by—



1 (A) identifying precompetitive research op-  
2 portunities;

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

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

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

15 (c) EXPANDING PARTICIPATION.—The Initiative  
16 shall include, to the maximum extent practicable, outreach  
17 to primarily undergraduate and minority-serving institu-  
18 tions about Initiative opportunities, and shall encourage  
19 the development of research collaborations between re-  
20 search-intensive universities and primarily undergraduate  
21 and minority-serving institutions.

22 (d) ETHICAL, LEGAL, ENVIRONMENTAL, SAFETY,  
23 SECURITY, AND SOCIETAL ISSUES.—Initiative activities  
24 shall take into account ethical, legal, environmental, safe-  
25 ty, security, and other appropriate societal issues by—

1           (1) supporting research, including in the social  
2           sciences, and other activities addressing ethical,  
3           legal, environmental, and other appropriate societal  
4           issues related to engineering biology, including inte-  
5           grating research on such topics with the research  
6           and development in engineering biology, and ensur-  
7           ing that the results of such research are widely dis-  
8           seminated, including through interdisciplinary engi-  
9           neering biology research centers described in sub-  
10          section (b)(1);

11          (2) supporting research and other activities re-  
12          lated to the safety and security implications of engi-  
13          neering biology, including outreach to increase  
14          awareness among Federal researchers and Federally-  
15          funded researchers at institutions of higher edu-  
16          cation about potential safety and security implica-  
17          tions of engineering biology research, as appropriate;

18          (3) ensuring that input from Federal and non-  
19          Federal experts on the ethical, legal, environmental,  
20          safety, security, and other appropriate societal issues  
21          related to engineering biology is integrated into the  
22          Initiative; and

23          (4) ensuring, through the agencies and depart-  
24          ments that participate in the Initiative, that public  
25          input and outreach are integrated into the Initiative

1 by the convening of regular and ongoing public dis-  
2 cussions through mechanisms such as workshops,  
3 consensus conferences, and educational events, as  
4 appropriate.

5 **SEC. 5. INITIATIVE COORDINATION.**

6 (a) INTERAGENCY COMMITTEE.—The President, act-  
7 ing through the Office of Science and Technology Policy,  
8 shall designate an interagency committee to coordinate en-  
9 gineering biology, which shall be co-chaired by the Office  
10 of Science and Technology Policy, and include representa-  
11 tives from the National Science Foundation, the Depart-  
12 ment of Energy, the Department of Defense, the National  
13 Aeronautics and Space Administration, the National Insti-  
14 tute of Standards and Technology, the Environmental  
15 Protection Agency, the Department of Agriculture, the  
16 National Institutes of Health, the Bureau of Economic  
17 Analysis, and any other agency that the President con-  
18 siders appropriate (in this section referred to as the  
19 “Interagency Committee”). The Director of the Office of  
20 Science and Technology Policy shall select an additional  
21 co-chairperson from among the members of the Inter-  
22 agency Committee. The Interagency Committee shall over-  
23 see the planning, management, and coordination of the  
24 Initiative. The Interagency Committee shall—

1           (1) provide for interagency coordination of Fed-  
2           eral engineering biology research, development, and  
3           other activities undertaken pursuant to the Initia-  
4           tive;

5           (2) establish and periodically update goals and  
6           priorities for the Initiative;

7           (3) develop, not later than 12 months after the  
8           date of enactment of this Act, and update every 3  
9           years, a strategic plan submitted to the Committee  
10          on Science, Space, and Technology of the House of  
11          Representatives and the Committee on Commerce,  
12          Science, and Transportation of the Senate that—

13                 (A) guides the activities of the Initiative  
14                 for purposes of meeting the goals and priorities  
15                 established under (and updated pursuant to)  
16                 paragraph (2); and

17                 (B) describes—

18                         (i) the Initiative's support for long-  
19                         term funding for interdisciplinary engineer-  
20                         ing biology research and development;

21                         (ii) the Initiative's support for edu-  
22                         cation and public outreach activities;

23                         (iii) the Initiative's support for re-  
24                         search and other activities on ethical, legal,  
25                         environmental, safety, security, and other

1 appropriate societal issues related to engi-  
2 neering biology including—

3 (I) an applied biorisk manage-  
4 ment research plan;

5 (II) recommendations for inte-  
6 grating security into biological data  
7 access and international reciprocity  
8 agreements;

9 (III) recommendations for manu-  
10 facturing restructuring to support en-  
11 gineering biology research, develop-  
12 ment, and scaling-up initiatives; and

13 (IV) an evaluation of existing  
14 biosecurity governance policies, guid-  
15 ance, and directives for the purposes  
16 of creating a unified, adaptable, evi-  
17 dence-based framework to respond to  
18 emerging biosecurity challenges cre-  
19 ated by advances in engineering biol-  
20 ogy;

21 (iv) how the Initiative will move re-  
22 sults out of the laboratory and into appli-  
23 cation for the benefit of society and United  
24 States competitiveness; and

1 (v) how the Initiative will measure  
2 and track the contributions of engineering  
3 biology to United States economic growth  
4 and other societal indicators;

5 (4) develop a national genomic sequencing  
6 strategy to ensure engineering biology research fully  
7 leverages plant, animal, and microbe biodiversity to  
8 enhance long-term innovation and competitiveness in  
9 engineering biology in the United States;

10 (5) develop a plan to utilize Federal programs,  
11 such as the Small Business Innovation Research  
12 Program and the Small Business Technology Trans-  
13 fer Program as described in section 9 of the Small  
14 Business Act (15 U.S.C. 638), in support of the ac-  
15 tivities described in section 4(b)(3); and

16 (6) in carrying out this section, take into con-  
17 sideration the recommendations of the advisory com-  
18 mittee established under section 6, the results of the  
19 workshop convened under section 7, existing reports  
20 on related topics, and the views of academic, State,  
21 industry, and other appropriate groups.

22 (b) TRIANNUAL REPORT.—Beginning with fiscal year  
23 2022 and ending in fiscal year 2028, not later than 90  
24 days after submission of the President’s annual budget re-  
25 quest and every third fiscal year thereafter, the Inter-

1 agency Committee shall prepare and submit to the Com-  
2 mittee on Science, Space, and Technology of the House  
3 of Representatives and the Committee on Commerce,  
4 Science, and Transportation of the Senate a report that  
5 includes—

6 (1) a summarized agency budget in support of  
7 the Initiative for the fiscal year to which such budg-  
8 et request applies, for the following 2 fiscal years,  
9 for the then current fiscal year, including a breakout  
10 of spending for each agency participating in the Pro-  
11 gram, and for the development and acquisition of  
12 any research facilities and instrumentation; and

13 (2) an assessment of how Federal agencies are  
14 implementing the plan described in subsection  
15 (a)(3), including—

16 (A) a description of the amount and num-  
17 ber of awards made under the Small Business  
18 Innovation Research Program and the Small  
19 Business Technology Transfer Program (as de-  
20 scribed in section 9 of the Small Business Act  
21 (15 U.S.C. 638)) in support of the Initiative;

22 (B) a description of the amount and num-  
23 ber of projects funded under joint solicitations  
24 by a collaboration of no fewer than 2 agencies  
25 participating in the Initiative; and

1 (C) a description of the effect of the newly  
2 funded projects by the Initiative.

3 (c) INITIATIVE OFFICE.—

4 (1) IN GENERAL.—The President shall establish  
5 an Initiative Coordination Office, with a Director  
6 and full-time staff, which shall—

7 (A) provide technical and administrative  
8 support to the interagency committee and the  
9 advisory committee established under section 6;

10 (B) serve as the point of contact on Fed-  
11 eral engineering biology activities for govern-  
12 ment organizations, academia, industry, profes-  
13 sional societies, State governments, interested  
14 citizen groups, and others to exchange technical  
15 and programmatic information;

16 (C) oversee interagency coordination of the  
17 Initiative, including by encouraging and sup-  
18 porting joint agency solicitation and selection of  
19 applications for funding of activities under the  
20 Initiative;

21 (D) conduct public outreach, including dis-  
22 semination of findings and recommendations of  
23 the advisory committee established under sec-  
24 tion 6, as appropriate;



1           (E) serve as the coordinator of ethical,  
2           legal, environmental, safety, security, and other  
3           appropriate societal input; and

4           (F) promote access to, and early applica-  
5           tion of, the technologies, innovations, and ex-  
6           pertise derived from Initiative activities to agen-  
7           cy missions and systems across the Federal  
8           Government, and to United States industry, in-  
9           cluding startup companies.

10          (2) FUNDING.—The Director of the Office of  
11          Science and Technology Policy shall develop an esti-  
12          mate of the funds necessary to carry out the activi-  
13          ties of the Initiative Coordination Office, including  
14          an estimate of how much each participating agency  
15          described in subsection (a) will contribute to such  
16          funds, and submit such estimate to Congress no  
17          later than 90 days after the enactment of this Act.

18          (3) TERMINATION.—The Initiative Coordination  
19          Office established under this subsection shall termi-  
20          nate on the date that is 10 years after the date of  
21          the enactment of this Act.

22          **SEC. 6. ADVISORY COMMITTEE.**

23          (a) IN GENERAL.—The agency co-chair of the inter-  
24          agency committee established in section 5 shall, in con-  
25          sultation with the Office of Science and Technology Policy,

1 designate or establish an advisory committee on engineer-  
2 ing biology research and development (in this section re-  
3 ferred to as the “advisory committee”) to be composed of  
4 not fewer than 12 members, including representatives of  
5 research and academic institutions, industry, and non-  
6 governmental entities, who are qualified to provide advice  
7 on the Initiative.

8 (b) ASSESSMENT.—The advisory committee shall as-  
9 sess—

10 (1) the current state of United States competi-  
11 tiveness in engineering biology, including the scope  
12 and scale of United States investments in engineer-  
13 ing biology research and development in the inter-  
14 national context;

15 (2) current market barriers to commercializa-  
16 tion of engineering biology products, processes, and  
17 tools in the United States;

18 (3) progress made in implementing the Initia-  
19 tive;

20 (4) the need to revise the Initiative;

21 (5) the balance of activities and funding across  
22 the Initiative;

23 (6) whether the strategic plan developed or up-  
24 dated by the interagency committee established

1 under section 5 is helping to maintain United States  
2 leadership in engineering biology;

3 (7) the management, coordination, implementa-  
4 tion, and activities of the Initiative; and

5 (8) whether ethical, legal, environmental, safety,  
6 security, and other appropriate societal issues are  
7 adequately addressed by the Initiative.

8 (c) REPORTS.—Beginning not later than 2 years  
9 after the date of enactment of this Act, and not less fre-  
10 quently than once every 3 years thereafter, the advisory  
11 committee shall submit to the President, the Committee  
12 on Science, Space, and Technology of the House of Rep-  
13 resentatives, and the Committee on Commerce, Science,  
14 and Transportation of the Senate, a report on—

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

17 (2) the advisory committee’s recommendations  
18 for ways to improve the Initiative.

19 (d) APPLICATION OF FEDERAL ADVISORY COM-  
20 MITTEE ACT.—Section 14 of the Federal Advisory Com-  
21 mittee Act (5 U.S.C. App.) shall not apply to the Advisory  
22 Committee.

23 (e) TERMINATION.—The advisory committee estab-  
24 lished under subsection (a) shall terminate on the date

1 that is 10 years after the date of the enactment of this  
2 Act.

3 **SEC. 7. EXTERNAL REVIEW OF ETHICAL, LEGAL, ENVIRON-**  
4 **MENTAL, SAFETY, SECURITY, AND SOCIETAL**  
5 **ISSUES.**

6 (a) IN GENERAL.—Not later than 6 months after the  
7 date of enactment of this Act, the Director of the National  
8 Science Foundation shall seek to enter into an agreement  
9 with the National Academies of Sciences, Engineering,  
10 and Medicine to conduct a review, and make recommenda-  
11 tions with respect to, the ethical, legal, environmental,  
12 safety, security, and other appropriate societal issues re-  
13 lated to engineering biology research and development.  
14 The review shall include—

15 (1) an assessment of the current research on  
16 such issues;

17 (2) a description of the research gaps relating  
18 to such issues;

19 (3) recommendations on how the Initiative can  
20 address the research needs identified pursuant to  
21 paragraph (2); and

22 (4) recommendations on how engineering biol-  
23 ogy researchers can best incorporate considerations  
24 of ethical, legal, environmental, safety, security, and

1 other societal issues into the development of research  
2 proposals and the conduct of research.

3 (b) REPORT TO CONGRESS.—The agreement entered  
4 into under subsection (a) shall require the National Acad-  
5 emies of Sciences, Engineering, and Medicine to, not later  
6 than 2 years after the date of the enactment of this Act—

7 (1) submit to the Committee on Science, Space,  
8 and Technology of the House of Representatives and  
9 the Committee on Commerce, Science, and Trans-  
10 portation of the Senate a report containing the find-  
11 ings and recommendations of the review conducted  
12 under subsection (a); and

13 (2) make a copy of such report available on a  
14 publicly accessible website.

15 **SEC. 8. AGENCY ACTIVITIES.**

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

18 (1) support basic research in engineering biol-  
19 ogy through individual grants, collaborative grants,  
20 and through interdisciplinary research centers;

21 (2) support research on the environmental,  
22 legal, ethical, and social implications of engineering  
23 biology;

24 (3) provide support for research instrumenta-  
25 tion for engineering biology disciplines, including

1 support for research, development, optimization and  
2 validation of novel technologies to enable the dy-  
3 namic study of molecular processes in situ;

4 (4) support curriculum development and re-  
5 search experiences for secondary, undergraduate,  
6 and graduate students in engineering biology and  
7 biomanufacturing; and

8 (5) award grants, on a competitive basis, to en-  
9 able institutions to support graduate students and  
10 postdoctoral fellows who perform some of their engi-  
11 neering biology research in an industry setting.

12 (b) DEPARTMENT OF COMMERCE.—As part of the  
13 Initiative, the Director of the National Institute of Stand-  
14 ards and Technology shall—

15 (1) establish a bioscience research program to  
16 advance the development of standard reference ma-  
17 terials and measurements and to create new data  
18 tools, techniques, and processes necessary to advance  
19 engineering biology and biomanufacturing;

20 (2) provide access to user facilities with ad-  
21 vanced or unique equipment, services, materials, and  
22 other resources to industry, institutions of higher  
23 education, nonprofit organizations, and government  
24 agencies to perform research and testing; and

1           (3) provide technical expertise to inform the po-  
2           tential development of guidelines or safeguards for  
3           new products, processes, and systems of engineering  
4           biology.

5           (c) DEPARTMENT OF ENERGY.—As part of the Ini-  
6           tiative, the Secretary of Energy shall—

7           (1) conduct and support research, development,  
8           demonstration, and commercial application activities  
9           in engineering biology, including in the areas of syn-  
10          thetic biology, advanced biofuel development,  
11          biobased materials, and environmental remediation;

12          (2) support the development, optimization and  
13          validation of novel, scalable tools and technologies to  
14          enable the dynamic study of molecular processes in  
15          situ; and

16          (3) provide access to user facilities with ad-  
17          vanced or unique equipment, services, materials, and  
18          other resources, including secure access to high-per-  
19          formance computing, as appropriate, to industry, in-  
20          stitutions of higher education, nonprofit organiza-  
21          tions, and government agencies to perform research  
22          and testing.

23          (d) DEPARTMENT OF DEFENSE.—As part of the Ini-  
24          tiative, the Secretary of Defense shall—

1           (1) conduct and support research and develop-  
2           ment in engineering biology and associated data and  
3           information sciences;

4           (2) support curriculum development and re-  
5           search experiences in engineering biology and associ-  
6           ated data and information sciences across the mili-  
7           tary education system, to include service academies,  
8           professional military education, and military grad-  
9           uate education; and

10          (3) assess risks of potential national security  
11          and economic security threats relating to engineering  
12          biology.

13          (e) NATIONAL AERONAUTICS AND SPACE ADMINIS-  
14          TRATION.—As part of the Initiative, the National Aero-  
15          nautics and Space Administration shall—

16               (1) conduct and support basic and applied re-  
17               search in engineering biology, including in synthetic  
18               biology, and related to Earth and space sciences,  
19               aeronautics, space technology, and space exploration  
20               and experimentation, consistent with the priorities  
21               established in the National Academies' decadal sur-  
22               veys; and

23               (2) award grants, on a competitive basis, that  
24               enable institutions to support graduate students and



1 postdoctoral fellows who perform some of their engi-  
2 neering biology research in an industry setting.

3 (f) DEPARTMENT OF AGRICULTURE.—As part of the  
4 Initiative, the Secretary of Agriculture shall—

5 (1) support research and development in engi-  
6 neering biology, including in synthetic biology and  
7 biomaterials;

8 (2) award grants through the National Institute  
9 of Food and Agriculture; and

10 (3) support development conducted by the Agri-  
11 cultural Research Service.

12 (g) ENVIRONMENTAL PROTECTION AGENCY.—As  
13 part of the Initiative, the Environmental Protection Agen-  
14 cy shall support research on how products, processes, and  
15 systems of engineering biology will affect or can protect  
16 the environment.

17 (h) DEPARTMENT OF HEALTH AND HUMAN SERV-  
18 ICES.—

19 (1) NATIONAL INSTITUTES OF HEALTH.—As  
20 part of the Initiative, the Director of the National  
21 Institutes of Health shall—

22 (A) support research and development to  
23 advance the understanding and application of  
24 engineering biology for human health, including  
25 in synthetic biology, cell and tissue engineering,

1 computational biology, and artificial intel-  
2 ligence;

3 (B) support and accelerate the application  
4 of biomedical research and technologies through  
5 cross-disciplinary collaboration and training  
6 programs;

7 (C) support research on ethical, legal, safe-  
8 ty, and societal implications of emerging bio-  
9 technologies; and

10 (D) award grants on a competitive basis,  
11 that enable institutions to support graduate  
12 students and postdoctoral fellows who perform  
13 some of their engineering biology research  
14 across multiple disciplinary departments.

15 (2) FOOD AND DRUG ADMINISTRATION.—As  
16 part of the Initiative, the Commissioner of Food and  
17 Drugs shall—

18 (A) support research and evaluation of  
19 safety, potency, and efficacy of novel biologic  
20 products and biomanufacturing technologies;  
21 and

22 (B) ensure the timely development of  
23 screening methods to evaluate safety and secu-  
24 rity of new biological products and processes.