

118TH CONGRESS
2D SESSION

S. 4413

To provide for the establishment of a National Synthetic Biology Center,
and for other purposes.

IN THE SENATE OF THE UNITED STATES

MAY 23, 2024

Mr. YOUNG (for himself and Mr. PADILLA) introduced the following bill; which
was read twice and referred to the Committee on Agriculture, Nutrition,
and Forestry

A BILL

To provide for the establishment of a National Synthetic
Biology Center, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Synthetic Biology Ad-
5 vancement Act of 2024”.

6 **SEC. 2. FINDINGS.**

7 Congress finds that—

8 (1) the application of synthetic biology to accel-
9 erate innovation in food and agriculture is critical
10 to—

1 (A) the national security and economic fu-
2 ture of the United States; and

3 (B) the ability of the United States to feed
4 and fuel the global economy;

5 (2) while agriculture has experienced significant
6 advancements in productivity and sustainability, the
7 future of the food system relies on disruptive tech-
8 nologies catalyzed by synthetic biology at the inter-
9 sections of soil health, plant science, animal health,
10 and, ultimately, human health;

11 (3) synthetic biology is a key tool to defend
12 against terrorism and high-consequence events;

13 (4) investments into synthetic biology will cata-
14 lyze the strengths of engineering, agriculture, and
15 manufacturing to develop a resilient food and agri-
16 culture system;

17 (5) resiliency is accomplished through advanced
18 biotechnology and digital solutions to keep the
19 United States at the forefront of feeding the United
20 States and the world;

21 (6) Congress has historically prioritized a safe
22 and secure food supply in the United States, as evi-
23 denced by the enactment of the Securing Our Agri-
24 culture and Food Act (Public Law 115–43; 131
25 Stat. 884); and

1 (7) innovation and research are necessary to
2 push the boundaries of science to develop disruptive
3 technologies that advance national security through
4 food security.

5 **SEC. 3. NATIONAL SYNTHETIC BIOLOGY CENTER.**

6 (a) DEFINITIONS.—In this section:

7 (1) 1862 INSTITUTION; 1890 INSTITUTION.—
8 The terms “1862 Institution” and “1890 Institu-
9 tion” have the meanings given those terms in section
10 2 of the Agricultural Research, Extension, and Edu-
11 cation Reform Act of 1998 (7 U.S.C. 7601).

12 (2) 1994 INSTITUTION.—The term “1994 Insti-
13 tution” has the meaning given the term in section
14 532 of the Equity in Educational Land-Grant Sta-
15 tus Act of 1994 (7 U.S.C. 301 note; Public Law
16 103–382).

17 (3) CENTER.—The term “Center” means the
18 National Synthetic Biology Center established under
19 subsection (b)(1).

20 (4) ELIGIBLE INSTITUTION.—The term “eligi-
21 ble institution” means—

22 (A) an 1862 Institution;

23 (B) an 1890 Institution; and

24 (C) a 1994 Institution.

1 (5) NATIONAL LABORATORY.—The term “Na-
2 tional Laboratory” has the meaning given the term
3 in section 2 of the Energy Policy Act of 2005 (42
4 U.S.C. 15801).

5 (6) SECRETARY.—The term “Secretary” means
6 the Secretary of Agriculture.

7 (b) ESTABLISHMENT OF NATIONAL SYNTHETIC BI-
8 OLOGY CENTER.—

9 (1) IN GENERAL.—The Secretary, in consulta-
10 tion with the head of any other relevant Federal
11 agency, shall establish a center, to be known as the
12 “National Synthetic Biology Center”, to award
13 grants, on a competitive basis, to eligible institu-
14 tions.

15 (2) PURPOSE.—The purpose of the Center is to
16 provide a hub for researchers and industry partners
17 in the United States to discover and develop science-
18 based solutions based on synthetic biology to im-
19 prove agricultural performance while minimizing en-
20 vironmental impact and improving overall food sys-
21 tem resiliency.

22 (c) PARTNERSHIPS.—The Center shall provide grants
23 to eligible institutions to carry out projects in partnership
24 with not fewer than 1 other entity, which may include—

25 (1) a nonprofit organization;

- 1 (2) a State entity;
- 2 (3) a National Laboratory;
- 3 (4) an 1862 Institution;
- 4 (5) an 1890 Institution;
- 5 (6) a 1994 Institution; or
- 6 (7) any combination of entities described in
- 7 paragraphs (1) through (6).

8 (d) APPLICATION.—

9 (1) IN GENERAL.—An eligible institution seek-
10 ing a grant under this section shall submit an appli-
11 cation to the Center at such time, in such manner,
12 and containing such information as the Center may
13 require.

14 (2) REQUIREMENTS.—An application submitted
15 under paragraph (1) shall include, at a minimum, a
16 description of how the proposed project will—

17 (A) promote innovative synthetic biology
18 technologies and practices that address current
19 and emerging challenges in the food and agri-
20 culture sector;

21 (B) foster the development and dissemina-
22 tion of science-based educational resources and
23 training programs on synthetic biology for
24 stakeholders in the agricultural community;

1 (C) enhance the efficiency, sustainability,
2 and resiliency of food production systems
3 through synthetic biology interventions; and

4 (D) monitor and evaluate the impacts, ben-
5 efits, and challenges of implementing synthetic
6 biology solutions in real-world agricultural set-
7 tings.

8 (e) USE OF FUNDS.—

9 (1) RESEARCH PRIORITIES.—In awarding
10 grants to eligible institutions, the Center shall
11 prioritize the following areas of research:

12 (A) Cellular biology.

13 (B) Genomes to phenomes.

14 (C) Microbiomes or microbes.

15 (D) Gene editing.

16 (E) Digital agriculture.

17 (F) Fermentation.

18 (G) Controlled environment agriculture.

19 (2) PURPOSES.—An eligible institution receiv-
20 ing a grant from the Center may use the grant for
21 the following purposes:

22 (A) To explore and advance biotechnology
23 applied to food science in the creation of new
24 protein sources for human and animal con-
25 sumption.

1 (B) To build on the Agricultural Genome
2 to Phenome Initiative (also known as the
3 “AG2PI”) of the National Institute of Food
4 and Agriculture to inform approaches to under-
5 standing how variable weather, environments,
6 and production systems interact with genetic di-
7 versity in crops and animals to impact growth
8 and productivity.

9 (C) To advance the development and com-
10 mercialization of nutritional and therapeutic in-
11 novations to improve the health of livestock and
12 companion animals.

13 (D) To create new crops that have func-
14 tional mutations that improve performance and
15 increase climate resiliency through increased ef-
16 ficiency in the use of inputs and increased dis-
17 ease and pest resistance.

18 (E) To apply artificial intelligence, ma-
19 chine learning, data science, and advanced com-
20 putational processes to accelerate modeling and
21 measurement for new synthetic biological solu-
22 tions.

23 (F) To strengthen advanced manufac-
24 turing sciences and infrastructure to use micro-
25 organisms to produce food and agricultural

1 products, including vaccines, crop protection
2 products, and food products for human and ani-
3 mal nutrition, by capitalizing on the strength of
4 food science, engineering, and pharmacy.

5 (G) To advance diversity of crops to in-
6 crease the food supply and explore pharma-
7 ceutical plant-based derivatives within a con-
8 trolled environment.

9 (f) TIMING OF AWARDS.—Not later than 1 year after
10 the date of enactment of this Act, the Center shall begin
11 awarding grants under this section.

12 (g) COORDINATION.—

13 (1) GRANT RECIPIENTS.—An eligible institution
14 receiving a grant from the Center under this section
15 shall endeavor to coordinate with a wide range of ex-
16 perts and researchers to create efficiency in the in-
17 novation development pipeline.

18 (2) CENTER.—The Center shall coordinate with
19 technology transfer offices or technology licensing of-
20 fices in order to disseminate innovations and reach
21 commercialization.

22 (h) WEBSITE.—The Center shall establish and main-
23 tain a website with a user friendly portal in order to dis-
24 seminate synthetic biology findings and connect research-
25 ers and innovators to collaborative opportunities.

1 (i) REPORT.—Not later than 2 years after the date
2 of enactment of this Act, and every 2 years thereafter,
3 the Center shall submit to the relevant committees of Con-
4 gress a report detailing—

5 (1) any findings from the research funded by
6 the Center;

7 (2) the progress of any innovation funded by
8 the Center;

9 (3) a description of the focus and proposed
10 goals of each grant recipient;

11 (4) an assessment, based on a common set of
12 metrics across all grant recipients, of the success of
13 each grant recipient in improving efficiency in the
14 innovation development pipeline; and

15 (5) any recommendations for administrative or
16 legislative action that may optimize the effectiveness
17 of the research activities carried out by grant recipi-
18 ents under this section.

19 (j) AUTHORIZATION OF APPROPRIATIONS.—There
20 are authorized to be appropriated to the Secretary—

21 (1) \$5,000,000 for each of fiscal years 2025
22 through 2029, to remain available until expended,
23 for the awarding of grants by the Center; and

24 (2) \$1,000,000 for each of fiscal years 2025
25 through 2029, to remain available until expended,

- 1 for the establishment of the Center and for other ac-
- 2 tivities of the Center.

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