

stitutions of higher education to support fundamental research leading to transformative advances in manufacturing technologies, processes, and enterprises that will support United States manufacturing through improved performance, productivity, sustainability, and competitiveness. Research areas may include—

- (1) nanomanufacturing;
- (2) manufacturing and construction machines and equipment, including robotics, automation, and other intelligent systems;
- (3) manufacturing enterprise systems;
- (4) advanced sensing and control techniques;
- (5) materials processing;
- (6) information technologies for manufacturing, including predictive and real-time models and simulations, virtual manufacturing;¹ and artificial intelligence and machine learning; and
- (7) additive manufacturing, including new material designs, complex materials, rapid printing techniques, and real-time process controls.

(b) Manufacturing education

In order to help ensure a well-trained manufacturing workforce, the Director shall award grants to strengthen and expand scientific and technical education and training in advanced manufacturing, including through the Foundation's Advanced Technological Education program.

(Pub. L. 111–358, title V, § 506, Jan. 4, 2011, 124 Stat. 4007; Pub. L. 117–167, div. B, title III, § 10358, Aug. 9, 2022, 136 Stat. 1563.)

Editorial Notes

CODIFICATION

Section was enacted as part of the America COMPETES Reauthorization Act of 2010, also known as the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Reauthorization Act of 2010, and also as part of the National Science Foundation Authorization Act of 2010, and not as part of the National Science Foundation Act of 1950 which comprises this chapter.

AMENDMENTS

Subsec. (a)(6). Pub. L. 117–167, § 10358(2), substituted “simulations, virtual manufacturing; and artificial intelligence and machine learning; and” for “simulations, and virtual manufacturing.”

Subsec. (a)(7). Pub. L. 117–167, § 10358(1), (3), added par. (7).

Statutory Notes and Related Subsidiaries

DEFINITIONS

For definitions of terms used in this section, see section 502 of Pub. L. 111–358, set out as a note under section 1862p of this title.

§ 1862p–2. Partnerships for innovation

(a) In general

The Director shall carry out a program to award merit-reviewed, competitive grants to institutions of higher education to establish and to expand partnerships that promote innovation and increase the impact of research by devel-

oping tools and resources to connect new scientific discoveries to practical uses.

(b) Partnerships

(1) In general

To be eligible for funding under this section, an institution of higher education must propose establishment of a partnership that—

- (A) includes at least one private sector entity; and
- (B) may include other institutions of higher education, public sector institutions, private sector entities, and nonprofit organizations.

(2) Priority

In selecting grant recipients under this section, the Director shall give priority to partnerships that include one or more institutions of higher education and at least one of the following:

- (A) A minority serving institution.
- (B) A primarily undergraduate institution.
- (C) A 2-year institution of higher education.

(c) Program

Proposals funded under this section shall seek—

(1) to increase the impact of the most promising research at the institution or institutions of higher education that are members of the partnership through knowledge transfer or commercialization;

(2) to increase the engagement of faculty and students across multiple disciplines and departments, including faculty and students in schools of business and other appropriate non-STEM fields and disciplines in knowledge transfer activities;

(3) to enhance education and mentoring of students and faculty in innovation and entrepreneurship through networks, courses, and development of best practices and curricula;

(4) to strengthen the culture of the institution or institutions of higher education to undertake and participate in activities related to innovation and leading to economic or social impact;

(5) to broaden the participation of all types of institutions of higher education in activities to meet STEM workforce needs and promote innovation and knowledge transfer; and

(6) to build lasting partnerships with local and regional businesses, local and State governments, and other relevant entities.

(d) Additional criteria

In selecting grant recipients under this section, the Director shall also consider the extent to which the applicants are able to demonstrate evidence of institutional support for, and commitment to—

(1) achieving the goals of the program as described in subsection (c);

(2) expansion to an institution-wide program if the initial proposal is not for an institution-wide program; and

(3) sustaining any new innovation tools and resources generated from funding under this program.

¹ So in original. The semicolon probably should be a comma.

(e) Limitation

No funds provided under this section may be used to construct or renovate a building or structure.

(Pub. L. 111–358, title V, §508, Jan. 4, 2011, 124 Stat. 4008.)

Editorial Notes**CODIFICATION**

Section was enacted as part of the America COMPETES Reauthorization Act of 2010, also known as the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Reauthorization Act of 2010, and also as part of the National Science Foundation Authorization Act of 2010, and not as part of the National Science Foundation Act of 1950 which comprises this chapter.

Statutory Notes and Related Subsidiaries**DEFINITIONS**

For definitions of terms used in this section, see section 2 of Pub. L. 111–358, set out as a note under section 6621 of this title, and section 502 of Pub. L. 111–358, set out as a note under section 1862p of this title.

§ 1862p–3. Sustainable chemistry basic research

The Director shall establish a Green Chemistry Basic Research program to award competitive, merit-based grants to support research into green and sustainable chemistry which will lead to clean, safe, and economical alternatives to traditional chemical products and practices. The research program shall provide sustained support for green chemistry research, education, and technology transfer through—

(1) merit-reviewed competitive grants to individual investigators and teams of investigators, including, to the extent practicable, young investigators, for research;

(2) grants to fund collaborative research partnerships among universities, industry, and nonprofit organizations;

(3) symposia, forums, and conferences to increase outreach, collaboration, and dissemination of green chemistry advances and practices; and

(4) education, training, and retraining of undergraduate and graduate students and professional chemists and chemical engineers, including through partnerships with industry, in green chemistry science and engineering.

(Pub. L. 111–358, title V, §509, Jan. 4, 2011, 124 Stat. 4009.)

Editorial Notes**CODIFICATION**

Section was enacted as part of the America COMPETES Reauthorization Act of 2010, also known as the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Reauthorization Act of 2010, and also as part of the National Science Foundation Authorization Act of 2010, and not as part of the National Science Foundation Act of 1950 which comprises this chapter.

Statutory Notes and Related Subsidiaries**COORDINATION OF SUSTAINABLE CHEMISTRY RESEARCH AND DEVELOPMENT**

Pub. L. 114–329, title I, §114, Jan. 6, 2017, 130 Stat. 2993, provided that:

“(a) IMPORTANCE OF SUSTAINABLE CHEMISTRY.—It is the sense of Congress that—

“(1) the science of chemistry is vital to improving the quality of human life and plays an important role in addressing critical global challenges, including water quality, energy, health care, and agriculture;

“(2) sustainable chemistry can reduce risks to human health and the environment, reduce waste, improve pollution prevention, promote safe and efficient manufacturing, and promote efficient use of resources in developing new materials, processes, and technologies that support viable long-term solutions to a significant number of challenges;

“(3) sustainable chemistry can stimulate innovation, encourage new and creative approaches to problems, create jobs, and save money; and

“(4) a coordinated effort on sustainable chemistry will allow for a greater return on research investment in this area.

“(b) SUSTAINABLE CHEMISTRY BASIC RESEARCH.—Subject to the availability of appropriated funds, the Director of the [National Science] Foundation may continue to carry out the Sustainable Chemistry Basic Research program authorized under section 509 of the National Science Foundation Authorization Act of 2010 (42 U.S.C. 1862p–3).”

DEFINITIONS

For definitions of terms used in this section, see section 502 of Pub. L. 111–358, set out as a note under section 1862p of this title.

§ 1862p–4. Undergraduate broadening participation program

The Foundation shall continue to support the Historically Black Colleges and Universities Undergraduate Program, the Louis Stokes Alliances for Minority Participation program, the Tribal Colleges and Universities Program, and Hispanic-serving institutions as separate programs.

(Pub. L. 111–358, title V, §512, Jan. 4, 2011, 124 Stat. 4011.)

Editorial Notes**CODIFICATION**

Section was enacted as part of the America COMPETES Reauthorization Act of 2010, also known as the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Reauthorization Act of 2010, and also as part of the National Science Foundation Authorization Act of 2010, and not as part of the National Science Foundation Act of 1950 which comprises this chapter.

Statutory Notes and Related Subsidiaries**DEFINITIONS**

For definitions of terms used in this section, see section 502 of Pub. L. 111–358, set out as a note under section 1862p of this title.

§ 1862p–5. Research experiences for high school students

The Director shall permit specialized STEM high schools conducting research to participate in major data collection initiatives from universities, corporations, or government labs under a research grant from the Foundation, as part of the research proposal.

(Pub. L. 111–358, title V, §513, Jan. 4, 2011, 124 Stat. 4011.)