AMENDMENT OFFERED BY Rep. Swalwell of California **TO THE AMENDMENT IN THE NATURE OF A SUBSTITUTE**

At the end of title III, insert the following new subtitle:

Subtitle B—Reauthorization of the National Nanotechnology Initiative

SEC. 311. SHORT TITLE.

This subtitle may be cited as the "National Nanotechnology Initiative Amendments Act of 2014".

SEC. 312. NATIONAL NANOTECHNOLOGY PROGRAM AMENDMENTS.

The 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501 et seq.) is amended—

(1) in section 2—

(A) in subsection (c), by amending paragraph (4) to read as follows:

"(4) develop, and update every 3 years thereafter, a strategic plan to guide the activities described under subsection (b) that specifies near-term and long-term objectives for the Program, the anticipated timeframe for achieving the near-term objectives, and the metrics to be used for assessing progress toward the objectives, and that describes—

"(A) how the Program will move results out of the laboratory and into applications for the benefit of society, including through cooperation and collaborations with nanotechnology research, development, and technology transition initiatives supported by the States; and

"(B) proposed research in areas of national importance in accordance with the requirements of section 316 of the National Nanotechnology Initiative Amendments Act of 2014;";

(B) in subsection (d)—

(i) by redesignating paragraphs (1) through (5) as paragraphs (2) through (6), respectively;

(ii) by inserting before paragraph (2), as redesignated by clause (i), the following:

"(1) the Program budget, for the previous fiscal year, for each agency that participates in the Program, and for each program component area;"; and

(iii) by amending paragraph (6), as redesignated by clause (i), to read as follows:

"(6) an assessment of how Federal agencies are implementing the plan described in subsection (c)(7) and a description of the amount of Small Business Innovative Research and Small Business Technology Transfer Research funds supporting the plan."; and

(C) by adding at the end the following new subsection:

"(e) STANDARDS SETTING.—The agencies participating in the Program shall support the activities of committees involved in the development of standards for nanotechnology and may reimburse the travel costs of scientists and engineers who participate in activities of such committees.";

(2) in section 3—

(A) by amending subsection (b)(1) to read as follows:

"(b) FUNDING.—

"(1) IN GENERAL.—The operation of the National Nanotechnology Coordination Office shall be supported by funds from each agency participating in the Program.

"(2) PROPORTION.—The portion of such Office's total budget provided by each agency for each fiscal year shall be in the same proportion as the agency's share of the total budget for the Program

for the previous fiscal year, as specified in the report required under section 2(d)(1).

"(3) EXCEPTION.—The Director of the National Nanotechnology Coordination Office may establish a minimum contribution or other exception to the requirement in paragraph (2) for participating agencies whose share of the total budget for the Program is below a threshold level, to be set by the Director."; and

(B) by adding at the end the following new subsection:

"(d) PUBLIC INFORMATION.—

"(1) DATABASE.—

"(A) IN GENERAL.—The National Nanotechnology Coordination Office shall develop and maintain a database accessible by the public of projects funded under at least the Environmental, Health, and Safety program component area, or any successor program component area, including, to the extent practicable, a description of each project, its source of funding by agency, and its funding history.

"(B) ORGANIZATION.—Projects shall be grouped by major objective as defined by the research plan required under section 3(b) of the

National Nanotechnology Initiative Amendments Act of 2014.

"(2) ACCESSIBLE FACILITIES.—

"(A) IN GENERAL.—The National Nanotechnology Coordination Office shall develop, maintain, and publicize information on nanotechnology facilities supported under the Program, and may include information on nanotechnology facilities supported by the States, that are accessible for use by individuals from academic institutions and from industry.

"(B) WEBSITES.—The National Nanotechnology Coordination Office shall maintain active web links to the websites for each of these facilities and shall work with each facility supported under the Program to ensure that each facility publishes on its respective website updated information on the terms and conditions for the use of the facility, a description of the capabilities of the instruments and equipment available for use at the facility, and a description of the technical support available to assist users of the facility.";

(3) in section 4—

(A) in subsection (a), by adding at the end the following: "The co-chairs of the Advisory Panel shall meet the qualifications of Panel membership required in subsection (b) and may be members of the President's Council of Advisors on Science and Technology. The Advisory Panel shall include members having specific qualifications tailored to enable it to carry out the requirements of subsection (c)(6).";

(B) in subsection (c)—

(i) by striking paragraph (1); and

(ii) by redesignating paragraphs (2) through (7) as paragraphs (1) through (6), respectively; and

(C) by amending subsection (d) to read as follows:

"(d) REPORTS.—The Advisory Panel shall report not less frequently than every 3 years, and, to the extent practicable, 1 year following each of the National Research Council triennial reviews required under section 5, to the President on its assessments under subsection (c) and its recommendations for ways to improve the Program. The Director of the Office of Science and Technology Policy shall transmit a copy of each report under this subsection to the Committee on Commerce, Science, and Transpor-

tation of the Senate, the Committee on Science, Space, and Technology of the House of Representatives, and other appropriate committees of the Congress.";

(4) by amending section 5 to read as follows:

"SEC. 5. TRIENNIAL EXTERNAL REVIEW OF THE NATIONAL NANOTECHNOLOGY PROGRAM.

"(a) IN GENERAL.—The Director of the National Nanotechnology Coordination Office shall enter into an arrangement with the National Research Council of the National Academy of Sciences to conduct a triennial review of the Program. The Director shall ensure that the arrangement with the National Research Council is concluded in order to allow sufficient time for the reporting requirements of subsection (b) to be satisfied. Each triennial review shall include an evaluation of the—

"(1) research priorities and technical content of the Program, including whether the balance of funding among program component areas, as designated according to section 2(c)(2), is appropriate;

"(2) Program's scientific and technological accomplishments and its success in transferring technology to the private sector; and

"(3) adequacy of the Program's activities addressing ethical, legal, environmental, and other ap-

propriate societal concerns, including human health concerns.

"(b) PRIORITY REPORTS.—If the Director of the National Nanotechnology Coordination Office, working with the National Research Council and with input from the Advisory Panel, determines that a more narrowly focused review of the Program is in the best interests of the Program, the Director may enter into such an arrangement with the National Research Council in lieu of a full review as required under subsection (a), but not more often than every second triennial review.

"(c) EVALUATION TO BE TRANSMITTED TO CONGRESS.—The National Research Council shall document the results of each triennial review carried out in accordance with this section in a report that includes any recommendations for changes to the Program's objectives, technical content, or other policy or Program changes. Each report shall be submitted to the Director of the National Nanotechnology Coordination Office, who shall transmit it to the Advisory Panel, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Science, Space, and Technology of the House of Representatives."; and

(5) in section 10—

(A) by amending paragraph (2) to read as follows:

"(2) NANOTECHNOLOGY.—The term 'nanotechnology' means the science and technology that will enable one to understand, measure, model, image, manipulate, and manufacture at the nanoscale, aimed at creating materials, devices, and systems with fundamentally new properties or functions."; and

(B) by adding at the end the following new paragraph:

"(7) NANOSCALE.—The term 'nanoscale' means one or more dimensions of between approximately 1 and 100 nanometers.".

SEC. 313. SOCIETAL DIMENSIONS OF NANOTECHNOLOGY.

(a) COORDINATOR FOR ENVIRONMENTAL, HEALTH, AND SAFETY RESEARCH.—The Director of the Office of Science and Technology Policy shall designate an associate director of the Office of Science and Technology Policy or other appropriate senior government official as the Coordinator for Environmental, Health, and Safety Research. The Coordinator shall be responsible for oversight of the coordination, planning, and budget prioritization of research and other activities related to environmental, health, safety, and other appropriate societal concerns re-

lated to nanotechnology. The responsibilities of the Coordinator shall include—

(1) ensuring that a research plan for the environmental, health, and safety research activities required under subsection (b) is developed, updated, and implemented and that the plan is responsive to the recommendations of the Advisory Panel established under section 4(a) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7503(a)); and

(2) encouraging and monitoring the efforts of the agencies participating in the Program to allocate the level of resources and management attention necessary to ensure that the environmental, health, safety, and other appropriate societal concerns related to nanotechnology are addressed under the Program.

(b) RESEARCH PLAN.—

(1) IN GENERAL.—The Coordinator for Environmental, Health, and Safety Research shall convene and chair a panel comprised of representatives from the agencies funding research activities under the Environmental, Health, and Safety program component area of the Program, or any successor program component area, and from such other agen-

cies as the Coordinator considers necessary to develop, periodically update, and coordinate the implementation of a research plan for this program component area. Such panel may be a subgroup of the Nanoscale Science, Engineering, and Technology Subcommittee of the National Science and Technology Council. In developing and updating the plan, the panel convened by the Coordinator shall solicit and be responsive to recommendations and advice from—

(A) the Advisory Panel established under section 4(a) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7503(a)); and

(B) the agencies responsible for environmental, health, and safety regulations associated with the production, use, and disposal of nanoscale materials and products.

(2) DEVELOPMENT OF STANDARDS.—The plan required under paragraph (1) shall include a description of how the Program will help to ensure the development of—

(A) standards related to nomenclature associated with engineered nanoscale materials;

(B) engineered nanoscale standard reference materials for environmental, health, and safety testing; and

(C) standards related to methods and procedures for detecting, measuring, monitoring, sampling, and testing engineered nanoscale materials for environmental, health, and safety impacts.

(3) COMPONENTS OF PLAN.—The plan required under paragraph (1) shall, with respect to activities described in paragraphs (1) and (2)—

(A) specify near-term research objectives and long-term research objectives;

(B) specify milestones associated with each near-term objective and the estimated time and resources required to reach each milestone;

(C) with respect to subparagraphs (A) and (B), describe the role of each agency carrying out or sponsoring research in order to meet the objectives specified under subparagraph (A) and to achieve the milestones specified under subparagraph (B); and

(D) specify the funding allocated to each major objective of the plan and the source of funding by agency for the current fiscal year.

(4) TRANSMITTAL TO CONGRESS.—Not later than 6 months after the date of enactment of this Act, the plan required under paragraph (1) shall be transmitted to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives.

(5) UPDATING AND APPENDING TO REPORT.—The plan required under paragraph (1) shall be updated at least every 3 years and may be submitted as part of the report required under section 2(c)(4) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(c)(4)).

SEC. 314. NANOTECHNOLOGY EDUCATION.

(a) UNDERGRADUATE EDUCATION PROGRAMS.—The Program shall support efforts to introduce nanoscale science, engineering, and technology into undergraduate science and engineering education through a variety of interdisciplinary approaches. Activities supported may include—

(1) development of courses of instruction or modules to existing courses;

(2) faculty professional development; and

(3) acquisition of equipment and instrumentation suitable for undergraduate education and research in nanotechnology.

(b) INTERAGENCY COORDINATION OF EDUCATION.—The Committee established under section 2(c) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(c)) shall coordinate, as appropriate, with the Committee established under section 101 of the America COMPETES Reauthorization Act of 2010 (42 U.S.C. 6621) to prioritize, plan, and assess the educational activities supported under the Program.

(c) SOCIETAL DIMENSIONS IN NANOTECHNOLOGY EDUCATION ACTIVITIES.—Activities supported under the Education and Societal Dimensions program component area, or any successor program component area, that involve informal, precollege, or undergraduate nanotechnology education shall include education regarding the environmental, health and safety, and other societal aspects of nanotechnology.

(d) REMOTE ACCESS TO NANOTECHNOLOGY FACILITIES.—

(1) IN GENERAL.—Agencies supporting nanotechnology research facilities as part of the Program shall require the entities that operate such facilities to allow access via the Internet, and support

the costs associated with the provision of such access, by secondary school students and teachers, to instruments and equipment within such facilities for educational purposes. The agencies may waive this requirement for cases when particular facilities would be inappropriate for educational purposes or the costs for providing such access would be prohibitive.

(2) PROCEDURES.—The agencies identified in paragraph (1) shall require the entities that operate such nanotechnology research facilities to establish and publish procedures, guidelines, and conditions for the submission and approval of applications for the use of the facilities for the purpose identified in paragraph (1) and shall authorize personnel who operate the facilities to provide necessary technical support to students and teachers.

SEC. 315. TECHNOLOGY TRANSFER.

(a) PROTOTYPING.—

(1) ACCESS TO FACILITIES.—In accordance with section 2(b)(7) of 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(b)(7)), the agencies supporting nanotechnology research facilities as part of the Program shall provide access to such facilities to companies for the

purpose of assisting the companies in the development of prototypes of nanoscale products, devices, or processes (or products, devices, or processes enabled by nanotechnology) for determining proof of concept. The agencies shall publicize the availability of these facilities and encourage their use by companies as provided for in this section. The agencies may waive this requirement for academic facilities for which the costs of providing such access would be prohibitive.

(2) PROCEDURES.—The agencies identified in paragraph (1)—

(A) shall establish and publish procedures, guidelines, and conditions for the submission and approval of applications for use of nanotechnology facilities;

(B) shall publish descriptions of the capabilities of facilities available for use under this subsection, including the availability of technical support; and

(C) may waive recovery, require full recovery, or require partial recovery of the costs associated with use of the facilities for projects under this subsection.

(3) SELECTION AND CRITERIA.—

(A) IN GENERAL.—In cases when less than full cost recovery is required pursuant to paragraph (2)(C), projects provided access to nanotechnology facilities in accordance with this subsection shall be selected through a competitive, merit-based process, and the criteria for the selection of such projects shall include at a minimum the readiness of the project for technology demonstration.

(B) SPECIAL CONSIDERATION.—The agencies may give special consideration in selecting projects to applications that are relevant to important national needs or requirements.

(b) COLLABORATION WITH INDUSTRY.—The Program shall coordinate with industry from all industrial sectors that would benefit from applications of nanotechnology by—

(1) enhancing communication of information related to nanotechnology innovation, including information about research, education and training, manufacturing issues, and market-driven needs;

(2) advancing and accelerating the creation of new products and manufacturing processes derived from discovery at the nanoscale by working with in-

dustry, including small and medium-sized manufacturers;

(3) developing innovative methods for transferring nanotechnology products and processes from Federal agencies to industry; and

(4) facilitating industry-led partnerships between the Program and industry sectors, including regional partnerships.

(c) COORDINATION WITH STATE, REGIONAL, AND LOCAL INITIATIVES.—Section 2(b)(5) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(b)(5)) is amended to read as follows:

"(5) ensuring United States global leadership in the development and application of nanotechnology, including through the coordination and leveraging of Federal investments with nanotechnology research, development, and technology transition initiatives supported by the States and regions across the country;".

SEC. 316. SIGNATURE INITIATIVES IN AREAS OF NATIONAL IMPORTANCE.

(a) IN GENERAL.—The Program shall include support for nanotechnology research and development activities directed toward topical and application areas that have the potential for significant contributions to national

economic competitiveness and for other significant societal benefits. The activities supported shall be designed to advance the development of research discoveries by demonstrating technical solutions to important national challenges. The Advisory Panel shall make recommendations to the Program for candidate research and development areas for support under this section.

(b) CHARACTERISTICS.—

(1) IN GENERAL.—Research and development activities under this section shall—

(A) include projects selected on the basis of applications for support through a competitive, merit-based process;

(B) involve collaborations among researchers in academic institutions and industry, and may involve nonprofit research institutions and Federal laboratories, as appropriate;

(C) when possible, leverage Federal investments through collaboration with related State initiatives; and

(D) include a plan for fostering the transfer of research discoveries and the results of technology demonstration activities to industry for commercial development.

(2) JOINT SOLICITATIONS.—Projects supported under this section shall include projects for which determination of the requirements for applications, review and selection of applications for support, and subsequent funding of projects shall be carried out by a collaboration of no fewer than 2 agencies participating in the Program. In selecting applications for support, agencies may, as appropriate, give special consideration to projects that include cost sharing from non-Federal sources.

(3) INTERDISCIPLINARY RESEARCH CENTERS.—Research and development activities under this section may be supported through interdisciplinary nanotechnology research centers, as authorized by section 2(b)(4) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(b)(4)), that are organized to investigate basic research questions and carry out technology demonstration activities in areas such as those identified in subsection (a).

(c) REPORT.—Reports required under section 2(d) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(d)) shall include a description of research and development areas supported in accordance with this section.

SEC. 317. NANOMANUFACTURING RESEARCH.

(a) RESEARCH AREAS.—The Program shall include research on—

(1) the development of instrumentation and tools required for the rapid characterization of nanoscale materials and for monitoring of nanoscale manufacturing processes; and

(2) approaches and techniques for scaling the synthesis of new nanoscale materials to achieve industrial-level production rates.

(b) GREEN NANOTECHNOLOGY.—Interdisciplinary research centers supported under the Program in accordance with section 2(b)(4) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(b)(4)) that are focused on nanomanufacturing research shall include as part of the activities of such centers—

(1) research on methods and approaches to develop environmentally benign nanoscale products and nanoscale manufacturing processes, taking into consideration relevant findings and results of research supported under the Environmental, Health, and Safety program component area, or any successor program component area;

(2) fostering the transfer of the results of such research to industry; and

(3) providing for the education of scientists and engineers through interdisciplinary studies in the principles and techniques for the design and development of environmentally benign nanoscale products and processes.

SEC. 318. DEFINITIONS.

In this subtitle, terms that are defined in section 10 of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7509) have the meaning given those terms in that section.

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