

U.S. SENATE COMMITTEE ON
SMALL BUSINESS AND ENTREPRENEURSHIP

An aerial photograph of Washington, D.C., showing the city skyline, the Washington Monument, and the Potomac River. A large, semi-transparent green star is overlaid on the left side of the image, partially covering the city and the river.

CRITICAL AMERICAN TECHNOLOGY VULNERABLE TO CHINA

**INVESTIGATION ALERT:
URGENT REFORMS NEEDED
IN SBIR PROGRAM TO
PROTECT NATIONAL SECURITY**

May 2025

Key Takeaways

Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs

The SBIR-STTR programs serve a key role in ensuring that the United States maintains technological supremacy. The programs award more than \$4 billion annually to small businesses seeking to develop and commercialize critical technologies.

Foreign Adversaries Exploit SBIR-STTR Programs Necessitating Due Diligence

A bombshell 2021 Department of Defense (DoD) report revealed that foreign adversaries, particularly the Chinese Communist Party (CCP), had infiltrated the SBIR-STTR programs for years to steal U.S. taxpayer-funded research and technology.

Through the *SBIR and STTR Extension Act of 2022*, Senator Joni Ernst (R-Iowa) created a foreign influence due diligence process to screen— **for the first time**— SBIR-STTR applicants for ties to adversaries and better protect taxpayer-funded innovations. This new provision required each participating agency to fully assess the security risks presented by each small business applying for funding.

Inadequate Due Diligence and Enforcement

Senator Ernst's establishment of a foreign ties due diligence program took an important first step by revealing that most applicants with a flagged foreign risk **still** received funding. Out of 835 applications flagged for a foreign risk, only **303** were denied for that risk.

This data obtained through Senate Committee on Small Business and Entrepreneurship Chair Ernst's oversight efforts revealed that federal agencies lack a standard process in evaluating foreign risks, leaving loopholes for China and others to exploit.

SBIR Mills Pose a Significant Risk

Most concerning—a small number of companies, known as SBIR mills, exploit the program by receiving the lion's share of funding, while maintaining troubling ties to foreign adversaries.

Ernst's new due diligence process uncovered that **six** of the **25** largest recipients of SBIR-STTR funding at the Department of Defense (DoD) have clear links to countries like **China**, yet still received nearly **\$180 million** in DoD awards in 2023 and 2024.

Chair Ernst's INNOVATE Act Strengthens Protections

Chair Ernst is closing the loopholes being exploited by foreign adversaries and ensuring taxpayer-funded research remains secure through her *Investing in National Next-Generation Opportunities for Venture Acceleration and Technological Excellence (INNOVATE) Act*.

The legislation takes a three-pronged approach, 1) improving the definition of “foreign risk,” to ensure that it is strong, clear, and applied consistently across all agencies; 2) requiring mandatory denials for companies with reviews that show adversarial ties; and, 3) strengthening clawback provisions, so that any company that does violate the law and expose taxpayer-funded research to any foreign adversary must pay the funding back in full.

Driving American Innovation: The SBIR and STTR Programs

Originally the Small Business Innovation Research (SBIR) program was created by Congress to provide small businesses with early-stage funding to advance research toward commercialization of their technological innovations for the benefit of government and private sector customers.¹ Eleven federal government agencies direct a dedicated percentage of their research budget to the program, ensuring that small businesses play a key role in fostering innovation. Five federal agencies carry out a complementary STTR program where small businesses work with outside research institutions to develop their technologies. In Fiscal Year (FY) 2024, the SBIR-STTR programs provided over \$4.7 billion in funding to small businesses building emerging technologies.

Since their inceptions, SBIR in 1982, and STTR in 1992, these programs have provided seed funding to thousands of small businesses seeking to commercialize emerging research in critical technology areas and contributed to the growth of multiple success stories.²

Chinese Infiltration in the SBIR-STTR Programs

In 2021, the DoD issued a groundbreaking report detailing how the CCP gained access to DoD-funded SBIR-STTR research for malign purposes.³ Their investigation showed that the CCP employed a number of tactics to steal SBIR-funded research and technologies. For example, in addition to recruiting U.S. employees at SBIR-backed firms, CCP agents bought U.S.-based SBIR startups and transitioned them over to Chinese firms or

convinced the U.S. firm to establish China-based subsidiaries that were subsequently “investigated” by the CCP. They also regularly overtook SBIR-backed U.S. firms through venture capital funding or arranged business partnerships with Chinese-tied firms to sell their products abroad.

Concerningly, the DoD report further detailed how China has leveraged the SBIR-STTR programs to identify DoD technology development priorities. It concluded that, in all their company case studies, China, not America, was the ultimate beneficiary of these U.S. government research investments. The report recommended that a due diligence process in the SBIR-STTR program be established to assess national security risks before further taxpayer funds go into the wrong hands.⁴

Senator Ernst Establishes Due Diligence Requirement

The 2021 DoD report and subsequent reporting by the Wall Street Journal led Senator Joni Ernst (R-Iowa) to create a first of its kind foreign due diligence program in the *SBIR and STTR Extension Act of 2022*. The legislation identified concerning financial, ownership, and academic interests between SBIR-STTR applicants and foreign countries of concern (Russia, Iran, China, and North Korea).⁵ As a result of Senator Ernst’s reforms, SBIR-STTR applicants are now required to submit a foreign ties disclosure form as part of their application.⁶

Over the past two and a half years, federal agencies administering the program have developed processes to implement the due diligence program, identify concerning relationships with these adversarial foreign countries as required by statute, and determine which risks warrant a denial of award. By mid-2023, all agencies with an SBIR program established an operational due diligence process to evaluate adversarial foreign ties.⁷ For the first time, agencies are evaluating foreign risk before SBIR awards are granted to small businesses and collecting data to understand adversarial threats to the program.

Inconsistent Standards Create Problems

The 2022 due diligence program was a major step forward because it produced a treasure trove of data, enabling Congress and federal agencies to analyze the scope of adversaries’ attempts to steal SBIR innovations.

In a November 2024 response to a [letter](#) from then-Ranking Member Ernst, each agency with an SBIR or STTR program, except the Department of Energy, provided data on their

due diligence programs including the number of applications flagged for a foreign risk, the nature of that foreign risk, and the number of applications denied on the basis of a foreign risk.⁸ This data is displayed below in Figure 1 and Figure 2.

Figure 1: SBIR-STTR Foreign Risk Flags and Denials in Fiscal Year (FY) 23 and FY24⁹

<u>Federal Agency</u>	<u>Number of Flagged Applications</u>	<u>Number of Denied Applications for a Foreign Risk</u>
National Science Foundation	6	2
National Institutes of Health	144	144
Department of Homeland Security*	1	1
Department of Transportation	0	0
National Institute of Standards and Technology	1	0
National Aeronautics and Space Administration	125	1**
Department of Education*	22	0
Department of Defense	522	152
Environmental Protection Agency	0	0
National Oceanic and Atmospheric Administration	5	0**
United States Department of Agriculture*	9	3
Department of Energy***	N/A	N/A

*Some agencies reported flagged “applicants” or “companies” in lieu of applications.

** Of applications flagged for concerning adversarial ties, NASA denied 107 applications and NOAA denied 3 applications due to lack of technical merit – not on the basis of their foreign ties.

*** As of April 2025, the Department of Energy did not provide requested data to the Senate Committee on Small Business and Entrepreneurship.

Figure 2: Nature of SBIR-STTR Foreign Risk Flags in FY23 and FY24¹⁰

<u>Federal Agency</u>	<u>Number of Cyber-security Flags</u>	<u>Number of Patent Analysis Flags</u>	<u>Number of Employee Analysis Flags</u>	<u>Number of Foreign Ownership Flags</u>	<u>Flags in a Different Category</u>
National Science Foundation	0	0	6*	6*	0
National Institutes of Health	19	7	98	22	134 (Financial Ties and Obligations)
Department of Homeland Security	1	0	0	0	0
Department of Transportation	0	0	0	0	0
National Institute of Standards and Tech.	0	0	1	0	0
National Aeronautics and Space Administration	0	1	105	5	25 (Business Arrangements and Funding)
Department of Education	0	1	19	2	2 (Supply Chain)
Department of Defense	0	79	386	178	63 (Financial Obligations)
Environmental Protection Agency	0	0	0	0	0
National Oceanic and Atmospheric Administration	0	0	5	0	0
United States Department of Agriculture	0	2	7	2	0
Department of Energy**	N/A	N/A	N/A	N/A	N/A

*National Science Foundation said their six flagged applications were a combination of employee and ownership flags.

**As of April 2025, the Department of Energy did not provide requested data to the Senate Committee on Small Business and Entrepreneurship.

Based on 11 Congressional briefings that further outlined due diligence implementation, it became evident that there were inconsistencies in how agencies identify foreign ties risks and determine when an applicant should be denied.¹¹ Some agencies seem willing to approve an applicant with a significant foreign ties risk when agency officials are determined to fund a certain technological capability, no matter the consequences.¹²

Further, existing loopholes allow certain adversarial relationships with SBIR-STTR awardees to avoid detection by current processes, and the extensive ties of certain SBIR mills and their spinoffs with Chinese researchers and institutions place significant amounts of taxpayer-funded intellectual property at risk. To counter American adversaries, reforms are needed to strengthen the foreign ties due diligence program.

Unfortunately, the conclusion of the sustained Congressional oversight of this issue is that further reforms are needed to fully protect the SBIR-STTR research and technologies from U.S. adversaries, particularly China.

SBIR Mills and Foreign Ties Concerns

The data gathered from the 2022 due diligence protocols also expose an extra national security weakness in the SBIR-STTR programs, the threat from SBIR mills—firms that specialize in writing SBIR grant applications and are adept at winning the most grants. A review of the 25 companies in DoD’s SBIR-STTR program with the most awards from 2010–2023 (receiving 7,251 awards amounting to a total of \$3.23 billion, all of which are considered SBIR mills) showed many of these firms had troubling ties with foreign adversaries.¹³ This evaluation, displayed below in Figures 3, 4, and 5, revealed that at least **six** out of the top 25 SBIR mills had problematic relationships with foreign adversaries yet continued to receive awards even after implementation of due diligence requirements. **In 2023 and 2024, these firms received 297 awards amounting to a total of \$178,420,926.**¹⁴

Given that these firms were evaluated under due diligence protocols dozens of times, once for each award they received since 2022, the continued dominance of these SBIR mills calls into question the consistency of due diligence standards. **This also raises concerns that hundreds of millions of taxpayer dollars have been knowingly exposed to adversarial risks.**

Figure 3: Foreign Adversarial Risks of SBIR Mills

<u>SBIR Mill</u>	<u>Type of Risk</u>	<u>Concerning Foreign Affiliations with Adversaries</u>
Luna Innovations Inc.	Joint Venture	Luna Innovations has a Guangdong, China based “designated agent and technical service center” operating as a joint venture with Jietong Technology Service Co., for its products in the Asia-Pacific region. ¹⁵
Triton Systems	Spinoff	<p>The long-time CEO of Triton Systems, Ross Haghighat, had recent ties to a Chinese government sponsored investment firm. In 2020, Ross Haghighat was appointed to the board of CITIC Capital Acquisition Corp, a special purpose acquisition company (SPAC) sponsored by CITIC Capital Holdings Limited, a branch of the Chinese state-owned CITIC Group.¹⁶</p> <p>FRX Polymers Inc., a spinoff of Triton Systems, received a \$22 million investment from Chinese investment firm CITIC Capital.¹⁷ In 2019, FRX Polymers started a joint venture with a Chinese company to produce flame retardants.¹⁸ Triton Systems received multiple SBIR awards to produce flame retardants, including awards used to develop technology at FRX Polymer.¹⁹ The Navy SBIR-STTR program touts the FRX Polymer spinoff as a success story for the program.²⁰ Mr. Haghighat was Chairman of the Board at FRX Polymers.²¹</p> <p>A separate spinoff of Triton Systems, Aduro Biotech, merged with the biotech company Chinook Therapeutics in 2020.²² In 2021, the company launched a joint venture with the Chinese biotech company Pivotal bioVenture Partners.²³ Ross Haghighat, was an independent director at both Aduro Biotech and Chinook Therapeutics.²⁴</p>
Lynntech	Personnel	A research scientist at Lynntech was recruited into a Chinese state-sponsored talent program. ²⁵ At the university he was recruited to, Zhengzhou University, he conducted research in similar scientific areas as did under SBIR-STTR awards at Lynntech. ²⁶

TDA Research	Joint Research	TDA Research has done joint research with Sinopec, a state-owned Chinese oil company, for several years. ²⁷
Kitware	Personnel	On its company blog, Kitware lists as customers of its technology Nanjing University of Aeronautics and Northwestern Polytechnical University - two universities that are part of China's Seven Sons of National Defense, a grouping of public universities affiliated with the Ministry of Industry and Information Technology of China. ²⁸ An employee of Kitware did joint research with academics at the University of Chinese Academy of Sciences, a state-backed Chinese research institution. ²⁹
Nanosonic Inc	Joint Research	STTR funding awarded to Nanosonic was used by Chinese researchers who also received funding from state-backed Chinese research institutions. ³⁰

Figure 4: SBIR Mills and Award Dollars/Count (FY 2010–FY 2023) ³¹

Company	Total SBIR–STTR Award Dollars	Award Count
Luna Innovations Inc.	\$206,311,172	493
Triton Systems	\$222,025,095	509
Lynntech Inc.	\$175,425, 516	474
TDA Research, Inc.	\$173,297,272	419
Kitware Inc.	\$98,707,634	172
Nanosonic Inc.	\$102,396,710	277

Figure 5: SBIR Mills and Award Dollars/Count (2023–2024) ³²

Company	Total SBIR–STTR Award Dollars	Award Count
Luna Innovations Inc.	\$6,850,417	8
Triton Systems	\$60,404,276	104
Lynntech Inc.	\$31,960,426	61
TDA Research, Inc.	\$38,119,898	62
Kitware Inc.	\$28,393,474	28
Nanosonic Inc.	\$12,692,435	34

Note: Foreign ties due diligence programs were operational at participating agencies by mid-2023

Chair Ernst's INNOVATE Act: Protecting American IP From China

It is vital to safeguard taxpayer-funded research from being exploited by adversarial interests. Furthermore, SBIR mills are profiting to the tune of hundreds of millions of tax dollars and crowding out truly small start-ups, as they develop business relationships that enable CCP agents to have access to U.S. technological innovations. Congress must ensure that the SBIR-STTR programs serve a competitive set of small businesses and maintain strong research security protocols that safeguard American emerging technologies from exploitation.

Based on these findings, Senator Ernst's *INNOVATE Act* builds upon her previous work and takes important steps to ensure taxpayer-funded research remains secure:

1. Establishes a clear and consistent definition of “foreign risk” as a consistent baseline for due diligence review across all participating agencies: a foreign affiliation, technology licensing agreement, joint venture, contractual or financial obligation (pending or otherwise), investment agreement, research relationship (including co-authorship), or business relationship between a small business (including subsidiaries, spinoffs, and affiliates) submitting a SBIR or STTR proposal, its owner, or other key personnel and individuals or entities in a foreign country of concern within the last 10 years.³³
2. Creates clear eligibility rules around foreign ties for SBIR-STTR applicants: requires a denial of awards for companies connected to adversarial entities on government sanctions lists, among other egregious adversarial ties.³⁴ Strengthens agencies' ability to deny awards to companies that pose a risk to national security at the discretion of the agency leadership.³⁵
3. Codifies collaboration between participating agencies and the intelligence community and/or relevant inspectors general on due diligence reviews.³⁶
4. Imposes a maximum \$75 million cap on lifetime SBIR-STTR Phase I and Phase II awards.³⁷
5. Strengthens agencies' ability to claw back SBIR and STTR awards when national security is at risk.³⁸

Endnotes

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⁶ SBIR and STTR Extension Act of 2022, Pub. L. No. 117-183, 136 Stat. 2180.

⁷ SBIR and STTR Extension Act of 2022, Pub. L. No. 117-183, §4(b)(2), 136 Stat. 2182.

⁸ See Figure 1 and Figure 2; Letter from Joni K. Ernst, S. Comm. on Small Business and Entrepreneurship, to Alejandro Mayorkas, Secretary, DHS, (Nov. 5, 2024), available at https://www.ernst.senate.gov/imo/media/doc/ernst_letter_re_sbir_due_diligence_data_compiled.pdf; Letter from Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, to Lloyd Austin, Secretary, DoD, (Nov. 5, 2024), available at https://www.ernst.senate.gov/imo/media/doc/ernst_letter_re_sbir_due_diligence_data_compiled.pdf; Letter from Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, to Pete Buttigieg, Secretary, DOT, (Nov. 5, 2024), available at https://www.ernst.senate.gov/imo/media/doc/ernst_letter_re_sbir_due_diligence_data_compiled.pdf; Letter from Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, to Miguel Cardona, Secretary, Dept. of Ed., (Nov. 5, 2024), available at https://www.ernst.senate.gov/imo/media/doc/ernst_letter_re_sbir_due_diligence_data_compiled.pdf; Letter from Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, to Michael Regan, Adm’r, EPA, (Nov. 5, 2024), available at https://www.ernst.senate.gov/imo/media/doc/ernst_letter_re_sbir_due_diligence_data_compiled.pdf; Letter from Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, to Bill Nelson, Adm’r, NASA, (Nov. 5, 2024), available at https://www.ernst.senate.gov/imo/media/doc/ernst_letter_re_sbir_due_diligence_data_compiled.pdf; Letter from Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, to Monica Bertagnolli, Director, NIH, (Nov. 5, 2024), available at https://www.ernst.senate.gov/imo/media/doc/ernst_letter_re_sbir_due_diligence_data_compiled.pdf; Letter from Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, to Laurie Locascio, Director, NIST, (Nov. 5, 2024), available at

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⁹ Letter from Thomas Vilsack, Secretary, USDA, to Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, (Dec. 13, 2024) (on file with Comm.); Letter from Sethuraman Panchanathan, Director, NSF, to Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, (Dec. 6, 2024) (on file with Comm.); Letter from Dmitri Kusnezov, Under Secretary, DHS, to Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, (Dec. 6, 2024) (on file with Comm.); Letter from Michael Lauer, Deputy Director for Extramural Research, NIH, to Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, (Dec. 4, 2024) (on file with Comm staff); Letter from Maureen Gwinn, Acting Assistant Administrator for Research and Development, EPA, to Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, (Dec. 19, 2024) (on file with Comm.); Letter from Robert Hampshire, Chief Science Officer, DOT, to Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, (Nov. 20, 2024) (on file with Comm.); Letter from Laurie Locascio, Director, NIST, to Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, (Nov. 21, 2024) (on file with Comm.); Letter from Alicia Brown, Associate Administrator for Legislative and Intergovernmental Affairs, NASA, to Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, (Nov. 20, 2024) (on file with Comm.); Letter from Matthew Soldner, Acting Director, Institute for Education Sciences, Dept. of Education, to Joni K. Ernst, Ranking Member, S. Comm. on Small Business and Entrepreneurship, (Dec. 9, 2024) (on file with Comm.);

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¹⁰ *Id.*

¹¹ USDA, NASA, DoD, Dept. of Ed, NSF, EPA, NIST, NIH, NOAA, DOE, DHS, and DOT Briefings on SBIR-STTR Due Diligence Implementation to S. Comm. on Small Business and Entrepreneurship Staff, H. Comm. on Small Business Staff, and H. Comm. on Science, Space, and Technology Staff, (July 11-12, 2024).

¹² *Id.*

¹³ SBA, *SBIR.gov Portfolio Award Data*, available at <https://www.sbir.gov/awards>.

¹⁴ SBA, *SBIR.gov Portfolio Award Data*, available at <https://www.sbir.gov/awards>. Award dollar total from SBIR.gov database (FY 2024 data incomplete as the database is continually updated throughout the year. As a result, data for FY24 is not expected to be complete until March 2025.)

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³⁰ Qingbo Wei et al, *Highly stable and efficient perovskite solar cells produced via high-boiling point solvents and additive engineering synergistically*, SPRINGER NATURE, (Apr. 14, 2020), available at <https://link.springer.com/article/10.1007/s11426-019-9727-8>; See “This work was supported by the National University Research Fund (GK261001009), the National Natural Science Foundation of China (61604090, 21663030), the Shaanxi Provincial Science and Technology Plan Project (2020JM-546), the Doctoral research initial funding from Yan’an University (YDBK2017-14), and the Natural Science Foundation of Yan’an University (YDQ2018-15). D. Y. acknowledged the financial support from Air Force Office of Scientific Research (FA9550-18-1-0233) and STTR Program (Nanosonic).”

³¹ SBA, *SBIR.gov Portfolio Award Data*, available at <https://www.sbir.gov/awards>.

³² SBA, *SBIR.gov Portfolio Award Data*, available at <https://www.sbir.gov/awards> (denoting award dollar total from SBIR.gov database but that FY 2024 data is incomplete as the database is continually updated throughout the year. As a result, data for FY24 is not expected to be complete until March 2025.)

³³ INNOVATE Act, S. 853, 119th Cong., § 401 (2025).

³⁴*Id.* at § 402; See U.S. DEP'T OF HOMELAND SEC., *Uyghur Forced Labor Prevention Act Entity List*, available at <https://www.dhs.gov/uflpa-entity-list>; OFF. OF FOREIGN ASSETS CONTROL, U.S. DEP'T OF THE TREASURY, *Non-SDN Chinese Military-Industrial Complex Companies List*, available at <https://home.treasury.gov/policy-issues/financial-sanctions/consolidated-sanctions-list/ns-cmic-list>; John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232 § 889, 132 Stat. 1636; William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, Pub. L. No. 116-283 § 1260H, 134 Stat. 3388, available at <https://media.defense.gov/2025/Jan/07/2003625471/-1/-1/1/ENTITIES-IDENTIFIED-AS-CHINESE-MILITARY-COMPANIES-OPERATING-IN-THE-UNITED-STATES.PDF>;

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³⁵ INNOVATE Act, S. 853, 119th Cong., § 402 (2025).

³⁶ *Id.*

³⁷ *Id.* at § 201.

³⁸ *Id.* at § 404.

