The Biotechnology Grand Challenges Act

Overview

The Biotechnology Grand Challenges Act would direct the President to establish grand challenges and allocate resources across federal agencies for biotechnology research and development.

Background

The National Security Commission on Emerging Biotechnology's (NSCEB) assessed in April 2025 that while the United States has led the world in biotechnology innovation for decades, that lead is at risk. This is largely because we have not unlocked "leap-ahead capabilities," or disruptive technologies that will rapidly drive progress.

To spark more biotechnology breakthroughs, the United States must act boldly, inspiring its innovation base and encouraging a range of projects, small and large, across the country by initiating grand research challenges. Congress should initiate and fund two grand research challenges, one to make biology predictably engineerable, and a second to develop novel biomanufacturing technologies to make scale-up predictable, rapid, and cost-competitive.

While the biotechnology community has worked toward these goals for decades, biological engineering can be slow, inefficient, and difficult to scale-up. Because of this, the community has yet to reach the maturity of many engineering fields, including electrical engineering, computer engineering, and mechanical engineering, where building and scaling-up end products is routine. Prioritizing breakthroughs in these grand challenge areas would mature the field of bioengineering and help create distributed, diversified, and flexible biomanufacturing across the United States—supporting job creation, driving economic growth, and securing America's supply chains to lead the world in biotechnology.

Available for House introduction

Available for Senate introduction

Congress established the National Security Commission on Emerging Biotechnology (NSCEB) to assess biotechnology's national security impact and recommend strategies to ensure American leadership.

Read the NSCEB's April 2025 report at https://www.biotech.senate.gov/final-report

Legislative Details

01 Activities

The bill instructs the Executive Office of the President (EOP), through the Office of Science and Technology Policy (OSTP) and in consultation with other offices and agencies, to establish biotechnology grand research challenges. Federal agencies would then administer the challenges based on their expertise and remit.

02 Grand Challenges

The grand challenges, making biology predictably engineerable and improving scale up, would have well-defined problems, clear targets and success metrics, be ambitious and achievable, and be clearly communicated to the public. Agencies would implement the grand challenges as prize competitions, offering rewards for successfully providing solutions. The rewards would range from $100,000 to $50 million. For more details on these grand challenges, see Appendix D (pgs. 7-11).

03 Reporting

Federal agencies would regularly report on their grand challenges, including active competitions, results of completed competitions, and efforts to publicize and encourage participation to their respective committees of jurisdiction.

04 Cost

The bill authorizes federal agencies to spend a total of $5 billion for a grand challenge to make biology predictably engineerable and $490 million for a grand challenge to make biotechnology scale-up predictable, rapid, and cost-competitive, over the course of 5 years. This would optimize taxpayer dollars going into federal biotechnology research and help to achieve leap-ahead capabilities, both in the basic and applied research areas of biotechnology.

Read the NSCEB's April 2025 report Appendix D at https://www.biotech.senate.gov/wp-content/uploads/2025/10/NSCEB-%E2%80%93-Appendices-%E2%80%93-Sep-30-25.pdf

Interested in leading or co-sponsoring this bill?

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