National Science and Technology Council

2026 "Precise Substance Manipulation: Decoding Key Mechanisms for Net-Zero Carbon Emissions and Precision Health" Call for Proposals

Background and Objectives

In response to the global challenges of climate change and sustainable human health, the "Precise Substance Manipulation: Decoding Key Mechanisms for Net-Zero Carbon Emissions and Precision Health" project has been launched. This project focuses on the precise analysis and manipulation of materials, from the molecular to atomic levels, to develop innovative technologies that effectively reduce carbon emissions and advance precision diagnostics and treatment. With rising global carbon emissions threatening both health and the economy, and an aging population coupled with chronic diseases straining healthcare systems, the urgency of developing and applying these technologies has become increasingly evident.

The project aims to tackle key challenges in achieving net-zero carbon emissions and advancing precision health by leveraging precise substance manipulation technologies. It seeks to explore mechanisms at the atomic and molecular levels and develop innovative approaches for precise manipulation. Key aspects of the project include molecular editing and structural regulation, as well as the design of reaction systems and detection strategies. In the domain of net-zero carbon emissions, the project explores and implements precise manipulation of chemical reaction pathways and material properties, enhancing material performance. It also aims to create advanced analytical methods to thoroughly evaluate catalyst efficiency and reaction control systems. In the domain of precision health, the focus is on identifying molecules critical to human health and applying manipulation techniques for detection and targeted therapies. This also involves using synthetic processes to enhance the efficacy of functional molecules and developing databases to improve or replace existing diagnostic molecular probes, increasing sensitivity and accuracy for early diagnosis and precision treatment.

The project emphasizes interdisciplinary collaboration and the development of innovative solutions for critical unmet needs. Through coordinated efforts, it aims to accelerate scientific and technological progress. In light of uncertainties and potential high risks in technological development, we encourage academia, research institutions, and industry to collaborate on forward-looking innovations. These efforts are expected to yield concrete outcomes in achieving sustainable net-zero carbon emissions and advancing precision health, addressing societal demands and contributing to significant progress in future science and technology.

Research and Development Directions

The project focuses on two main domains:

1. **Efficient Energy Reuse and Negative Carbon Strategy**: This domain includes carbon capture and reuse, affordable high-performance catalytic materials, hydrogen energy, and innovations in high-efficiency energy conversion. The goal is to increase energy reuse efficiency, improve carbon capture effectiveness, and reduce energy consumption, ultimately driving long-term net-zero carbon emissions.
2. **Precision Health Diagnostics and Treatment**: This domain focuses on developing precise methods for disease prevention and treatment. It aims to achieve early diagnosis, prevention, and personalized treatment through highly accurate diagnostic and therapeutic techniques. It also focuses on drug design and development to address individual differences in precision health management and treatment.

Proposal Guidelines

1. **Targeted Objectives and Key Focus Areas**: The overall project proposal should clearly state the main objectives and highlight key challenges, with a focus on innovative solutions. The ultimate goal of the proposal is to address the critical technologies for achieving net-zero carbon emissions and precision health. The project content should include four-year R&D objectives, a comprehensive technical roadmap, domestic and international situation analysis, quantifiable targets, and strategies for achieving these targets.

2. **Innovative Solutions and Feasibility Assessment**: With diverse pathways to achieving net-zero carbon emissions and precision health, we encourage applicants to propose innovative solutions. The proposal should clearly define milestones and include a feasibility assessment. If necessary, multiple R&D approaches can be pursued in parallel.
3. **Industry Collaboration**: The project aims to reduce pathfinding risks for domestic industries by fostering industry partnerships. It encourages collaboration to develop next-generation technologies and boost industry investment in advanced research.
4. **Interdisciplinary Collaboration and Resource Integration**: The formation of interdisciplinary teams involving academia, research institutions, and industry is highly encouraged. Beyond experimental validation, theoretical foundations are also essential for evaluating high-risk technologies and guiding future developments.
5. **International Competitiveness**: The proposal should reflect a strong ambition to achieve international leadership, including publishing in top-tier journals, competing in international contests, and attending global exhibitions. These efforts aim to strengthen Taiwan's technical capabilities and boost its international visibility in related fields.

Proposal Submission

1. Applying institutions and principal investigators (PIs) must adhere to the National Science and Technology Council (NSTC) regulations.
2. The proposal is limited to multi-year integrated research plans, each consisting of 2 to 4 sub-projects (with one led by the project lead). Sub-project PIs must actively participate in the research, and the proposal should clearly define the research topics for each sub-project. The integrated project must have a clearly defined overall objective and be submitted by the project lead's affiliated institution.
3. The annual budget typically ranges from 5 to 10 million NTD, with the final amount contingent on review results and available funding.
4. The application process consists of two stages— "Concept Paper" and "Full Proposal":
   (1) Concept Paper Stage: The concept paper should be limited to 6 pages (following the

provided format). Applicants must submit it online through the NSTC system by Nov. 26, 2025. After review, selected teams will be invited to present their proposals.

(2) Full Proposal Stage: Once the concept paper is approved, the NSTC will notify the applicant's institution to submit a full proposal. The PI must revise the full proposal as needed. The applicant institution must complete the online submission by the specified deadline. The full proposal must adhere to the page limits outlined in the "Proposal Guidelines (Form CM03)."

Review and Funding Approval

1. The review process includes a documentary review followed by a committee evaluation. As this is a special project, there is no appeal process for rejected proposals.
2. The project is structured as a four-year plan, starting from August 1, 2026. Upon approval, multi-year funding will be provided, with annual evaluations to monitor project progress and outcomes. Funding for subsequent years will be contingent on the results of these reviews.
3. Evaluation Criteria:
   (1) Alignment of the proposal's ambition with the project's goal to address technical challenges.
   (2) Novelty and excellence in academic research.
   (3) Feasibility of practical applications.
   (4) A well-defined technical roadmap.
   (5) Theoretical foundations of the proposed technologies.
   (6) Execution capability of the PI.
   (7) Complementary strengths of team members and their capacity for interdisciplinary integration.
4. Once funding is approved, this project will count toward the project lead's total project quota under NSTC regulations, but it will not count toward the sub-project PIs' quotas.
5. The project lead may lead only one project under this program and cannot serve as a sub-project PI for any other projects in the program.

Project Execution and Evaluation

1. The NSTC will conduct regular evaluations, and the project team must provide progress updates, results, and attend review meetings.
2. The project team must work with the NSTC on reporting outcomes, advancing applications, and facilitating outreach and promotion.
3. If the total program budget for any financial year is not approved or is reduced, the NSTC may adjust the funding accordingly.
4. If performance is unsatisfactory without improvement, funding may be reduced or the project terminated.

Additional Considerations

1. Project contracts, funding usage, extensions, amendments, financial reporting, and report submissions must comply with NSTC regulations.
2. For matters not covered here, please follow NSTC regulations.

Contact

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