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Rapid response to:

***Cuts to scientific funding will be detrimental to the US, achieving the opposite to Trump's stated aims***

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**Rapid Response:**

**When "scientific blood transfusion" meets policy Blood loss: the neglected ecological chain of research**

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Dear Editor

When "scientific blood transfusion" meets policy Blood loss: the neglected ecological chain of research

The Trump administration's decision to freeze research funding is like taking the initiative to disarm in the "technological arms race" in the era of the knowledge economy. This opinion eloquently argues for the link between research investment and national competitiveness but ignores a more fundamental issue: the fragility of the research ecosystem is far greater than thought. We should be wary of policymakers' arrogant misjudgment of the "indirect costs" of research, which is like looking at a restaurant's signature dish while denying the need for a kitchen.

The original article accurately captures the key entry point of "indirect costs": the federal government has slashed the percentage of indirect costs allocated by NIH from a maximum of 70% to 15% [1]. The author uses a "kitchen operation" metaphor to illustrate that these funds maintain laboratory security, equipment maintenance, and other infrastructure. However, this discussion still stays at the level of economic accounts and fails to touch the deeper crisis of intergenerational transmission of scientific research. Most of the 5,200 federal scientists to be eliminated are early-career researchers, and this "pinching" of layoffs is like cutting off the sprouts of a fruit tree, resulting in a shortage of innovative talent over the next decade. When policymakers shout "Make America healthy," they are destroying the nurseries that nurture the guardians of health.

What is more alarming is the paradox of the commercialization of scientific research that is not fully developed in the original text. The success of GLP-1 drugs [2] has benefited from NIH funding, but simplifying it to a linear relationship of "government investment = medical progress" obscures the critical role of R&D investment by pharmaceutical companies. According to the data, Eli Lilly will spend \$9.31 billion on research and development in 2023 [3], far exceeding its NIH funding amount in the same period. This selective narrative may mislead the public about the ecology of research—basic research and industrial transformation should be symbiotic, not zero-sum. When policies

suppress public investment in research, they actually weaken the cornerstone of corporate research and development and ultimately lead to the collapse of the entire innovation chain.

From the perspective of system theory, the "domino effect" caused by the freezing of scientific research funds goes far beyond the economic ledger. The cancellation of the Qualtrics data collection project not only means the loss of experimental data but also leads to the failure of epidemic warning models and the disconnection of drug clinical trials. This shortsighted policy runs counter to the laws of technological development: the AI-powered Fourth Industrial Revolution requires sustained investment in basic research, and the United States is destroying its proud "Bell Labs model"—a long-termism tradition that allows scientists to explore freely.

Re-reading this cautionary commentary, we should not only guard against the rise of scientific populism but also establish a more three-dimensional understanding of the value of scientific research. True greatness lies not in a drug patent or an economic indicator, but in sustaining the entire ecosystem that gave birth to penicillin and mRNA vaccines. When policymakers use financial calculators to measure the value of science, they are turning off the searchlights that illuminate the future.

#### References

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**Competing interests:** No competing interests