NIH to Prioritize Human-Based Research Technologies

New initiative aims to reduce use of animals in NIH-funded research.

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The National Institutes of Health (NIH) is adopting a new initiative to expand innovative, human-based science while reducing animal use in research. Developing and using cutting-edge alternative nonanimal research models aligns with the U.S. Food and Drug Administration's (FDA) recent initiative to reduce testing in animals.

While traditional animal models continue to be vital to advancing scientific knowledge, using new and emerging technologies can offer unique strengths that, when utilized correctly or in combination, can expand the toolbox for researchers to answer previously difficult or unanswerable biomedical research questions.

"For decades, our biomedical research system has relied heavily on animal models. With this initiative, NIH is ushering in a new era of innovation," said NIH Director Dr. Jay Bhattacharya. "By integrating advances in data science and technology with our growing understanding of human biology, we can fundamentally reimagine the way research is conducted—from clinical development to real-world application. This human-based approach will accelerate innovation, improve healthcare outcomes, and deliver life-changing treatments. It marks a critical leap forward for science, public trust, and patient care."

Some bodies of research have been inconclusive on the efficacy of translating the results of animal models to human diseases, such as Alzheimer's disease and cancer. These translational challenges to humans may be due to differences in anatomy, physiology, lifespan, and disease characteristics. While humans and animals may share genes, some studies have shown there could be functional differences between organ and body systems that may result in some translational limitations.

New and emerging technologies have begun to allow researchers to study health and disease using human information, making them an alternative avenue to yield replicable, translatable, and efficient results either alone or in combination with animal models. These technologies include:

- Organoids, tissue chips, and other in vitro systems that allow scientists to model human disease

and capture human variability and patient-specific characteristics.

- Computational models which simulate complex biological human systems, disease pathways, and drug interactions.
- Real-world data that allow scientists to study health outcomes in humans at community and population levels.

To integrate innovative human-based science, the NIH intends to establish the Office of Research Innovation, Validation, and Application (ORIVA) within NIH's Office of the Director. The new office will coordinate NIH-wide efforts to develop, validate, and scale the use of non-animal approaches across the agency's biomedical research portfolio and serve as a hub for interagency coordination and regulatory translation for public health protection.

ORIVA will expand funding and training in non-animal approaches and awareness of their value in translational success. New funding opportunities will include evaluation criteria that assess methods based on their suitability for the research question, context of use, translatability, and human relevance. Infrastructure for non-animal approaches will also be expanded to make these methods more accessible to researchers.

In addition, grant review staff will participate in mitigation training to address any possible bias towards animal studies and integrate experts on alternative methods into study sections. NIH will also publicly report on research spending annually to measure progress toward reduction of funding for animal studies and an increase in funding for human-based approaches.

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