

Transforming Translational Research

The National Center for Advancing Translational Sciences (NCATS) is one of 27 Institutes and Centers (ICs) at the National Institutes of Health (NIH). Established to transform and accelerate the translational research process, NCATS is all about getting more treatments to more patients more quickly. The Center complements other NIH ICs, the private sector and the nonprofit community; rather than concentrating on specific diseases, NCATS focuses on what is common among them.

Translation is the process of turning observations in the laboratory, clinic and community into interventions that improve the health of individuals and the public — from diagnostics and therapeutics to medical procedures and behavioral changes.

Translational science is the field of investigation focused on understanding the scientific and operational principles underlying each step of the translational process.

Bridging the Gap

Several thousand genetic diseases affect humans, of which only about 500 have any treatment. A novel drug, device or other intervention can take about 14 years and cost \$2 billion or more to develop, and about 95 percent never make it past clinical trials. Even when a new drug or other intervention is developed and shown to be effective in clinical trials, many years may pass before all patients who could benefit from it are identified and treated.

Numerous scientific and organizational roadblocks can limit the speed of progress. Obstacles along the path to translation include:

- Lack of understanding about the science of translation, leading to unpredictability and frequent failure of possible interventions
- A shortage of qualified investigators
- Organizational structures and incentives that do not encourage the teamwork essential to translational science
- Inflexible, inefficient clinical trial designs and low participation in studies
- Regulatory science issues

NCATS aims to bridge these gaps by **developing** new approaches, technologies, resources and models; **demonstrating** their usefulness; and **disseminating** the resulting data, analyses and methodologies to the broad scientific community.

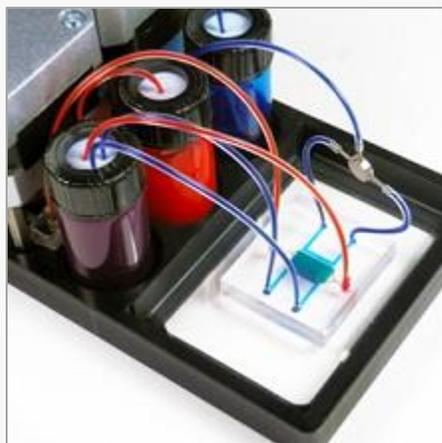
Translation Is a Team Sport

The translational journey from a basic discovery to a demonstrated improvement in public health requires multiple teams of scientists, clinicians and other stakeholders with wide-ranging expertise and perspectives.

NCATS studies translation on a system-wide level as a scientific and operational problem, developing and supporting innovative collaborations across traditionally separate scientific disciplines and organizations, including government agencies, academia, industry and patient organizations. Serving as a catalyst for translational science, the Center convenes teams with diverse expertise — in disease biology, toxicity, informatics, biomarkers, clinical trials, public health and other areas — to reduce, remove or bypass significant bottlenecks across the entire continuum of translation.



ncats.nih.gov



For More Information

About NCATS

ncats.nih.gov/about.html

NCATS Programs

ncats.nih.gov/programs.html

Frequently Asked Questions

ncats.nih.gov/faq.html

Contact

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Spanning the Full Spectrum of Translation

NCATS' programs and initiatives span the entire spectrum of translational science. Examples include:

- **Bridging Interventional Development Gaps (BrIDGs)** program. BrIDGs provides targeted contract access to drug development resources that allow academic, not-for-profit and small business collaborators to generate the data they need to submit an Investigational New Drug application to the FDA.
- **Clinical and Translational Science Awards (CTSA)** program. This innovative national network of medical research institutions — called “hubs” — helps NCATS tackle system-wide and operational problems to make the clinical and translational research enterprise more efficient. CTSA hubs collaborate locally, regionally and nationally to foster innovation in all aspects of translational science, including training the workforce, patient and community engagement, multisite clinical trials, and new methodologies such as cutting-edge informatics.
- **Discovering New Therapeutic Uses for Existing Molecules (New Therapeutic Uses)** program. Using a crowdsourcing approach, the program supports collaborations between pharmaceutical companies and academic researchers to rapidly test new ideas for existing investigational compounds.
- **Genetic and Rare Diseases Information Center (GARD)**. This collaboration with the National Human Genome Research Institute offers comprehensive information on rare and genetic diseases to patients, their families, health care providers and the public.
- **Therapeutics for Rare and Neglected Diseases (TRND)** program. TRND supports research collaborations among NIH and academic scientists, patient organizations and biopharmaceutical companies to encourage and speed the discovery of new drugs for rare and neglected diseases.
- **Tissue Chip for Drug Screening (Tissue Chip)** initiative. This partnership with the Defense Advanced Research Projects Agency and the Food and Drug Administration (FDA) is designed to develop 3-D human tissue chips that model the structure and function of human organs, such as the lung, liver and heart, and then combine these chips into an integrated system that can mimic complex functions of the human body.
- **Toxicology in the 21st Century (Tox21)** initiative. Tox21 is a collaborative effort among NIH — including NCATS and the National Toxicology Program at the National Institute of Environmental Health Sciences — the Environmental Protection Agency and the FDA. Through Tox21, researchers are testing 10,000 drugs and environmental chemicals for their potential to affect molecules and cells in ways that can cause health problems. The compounds undergo testing in NCATS' **high-speed robotic screening system**.
- **Rare Diseases Clinical Research Network (RDCRN)**. This initiative, which involves researchers and patient engagement groups, aims to address many of the challenges in studying and developing treatments for rare diseases, including difficulties in diagnosis, widely dispersed patients and scientific experts, and a perceived high risk and cost for developing such therapies.

As a catalyst, integrator and collaborator, NCATS continues to listen and respond to the needs of the translational community, which includes researchers, clinicians, regulators, patient and community groups, and industry. NCATS will continue to evolve its programs and initiatives in response to results and continued input.