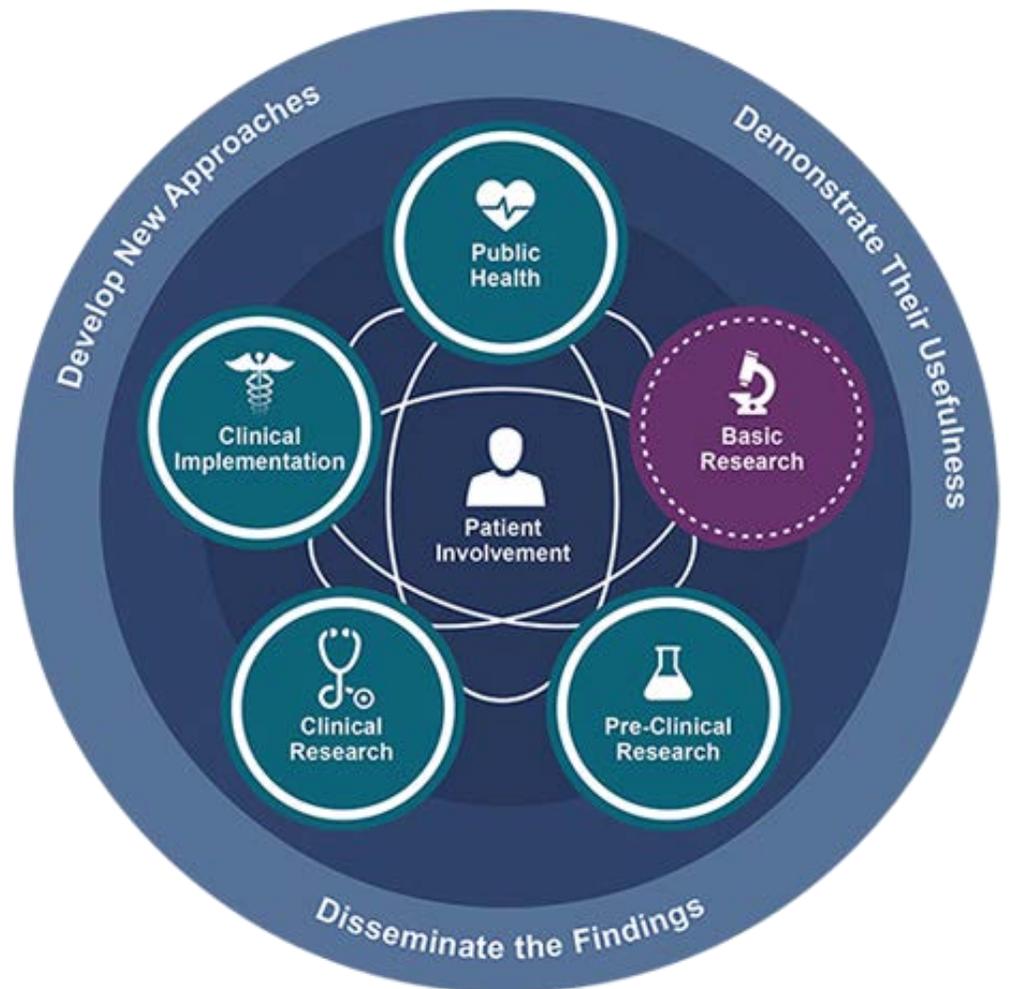


## Translational Science Spectrum

The translational science spectrum represents each stage of research along the path from the biological basis of health and disease to interventions that improve the health of individuals and the public. The spectrum is not linear or unidirectional; each stage builds upon and informs the others. At all stages of the spectrum, NCATS develops new approaches, demonstrates their usefulness and disseminates the findings. Patient involvement is a critical feature of all stages in translation.



U.S. Department of Health  
and Human Services

National Institutes of Health

NIH...Turning Discovery Into Health



## For More Information

### About Translation

[ncats.nih.gov/translation](http://ncats.nih.gov/translation)

### About NCATS

[ncats.nih.gov/about](http://ncats.nih.gov/about)

### NCATS Programs

[ncats.nih.gov/programs](http://ncats.nih.gov/programs)

### Contact

[info@ncats.nih.gov](mailto:info@ncats.nih.gov)

301-435-0888

## Basic Research

Basic research involves scientific exploration that can reveal fundamental mechanisms of biology, disease or behavior. Every stage of the translational research spectrum builds upon and informs basic research, which is conducted at many Institutes and Centers across NIH. NCATS scientists typically do not conduct basic research. However, insights gained from the Center's studies along the translational spectrum can inform basic research.

## Pre-Clinical Research

Pre-clinical research connects basic science and human medicine. During this stage, scientists apply fundamental discoveries made in the laboratory or the clinic to further understand the basis of a disease or disorder and find ways to treat it. Hypothesis testing is carried out using cell or animal models; samples of human or animal tissues; or computer-assisted simulations of drug, device or diagnostic interactions within living systems.

## Clinical Research

Clinical research includes clinical trials with human subjects to test intervention safety and effectiveness, behavioral and observational studies, outcomes and health services research, and the testing and refinement of new technologies. The goal of many clinical trials is to obtain regulatory approval for an intervention.

## Clinical Implementation

The clinical implementation stage of translation involves the adoption of interventions into routine clinical care for the general population. This stage also includes implementation research to evaluate clinical trial results and identify new clinical questions and gaps in care.

## Public Health

In this stage of translation, researchers study health outcomes at the population level to determine the effects of diseases and efforts to prevent, diagnose and treat them. Findings help guide scientists working to improve interventions or develop new ones.

---

**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.

---