NIBIB's mission is to transform through engineering the understanding of disease and its prevention, detection, diagnosis, and treatment. NIBIB supported research has pioneered groundbreaking advances to create technologies that are essential to extending the health span, by personalizing diagnosis and treatment and significantly improving quality of life. As the hub at NIH for expanding technologies across diseases and disorders, NIBIB support is driving research to benefit patients and healthcare professionals and promote further biomedical discovery.

Research Programs

Intramural Research Program
The Intramural Research Program (IRP) supports NIBIB's mission to integrate bioengineering with the physical and life sciences by researching basic, translational, and clinical science, and conducting effective training programs in related fields. The IRP is in the NIH campus in Bethesda, Maryland.

Extramural Research Programs
NIBIB supports research and training at universities, hospitals, industries, and research institutions across the country through its Extramural Research Program.

The scientific research areas supported by NIBIB cover a range of programs that lead to new, faster, and less costly ways to advance technologies from the blackboard to benchtop to bedside.

Major areas of research in which NIBIB invests are:

- Sensing and imaging health and disease
- Engineered biosystems
- Quantitative data science, modeling, and computation
- Advanced therapies and treatments
- Workforce training

Examples of NIBIB-supported Research

Pain-free blood glucose measurement
People with diabetes must prick their finger multiple times a day to test their blood glucose levels which is painful to do often. A new non-invasive, pain-free method can measure glucose as accurately as a finger prick. The technology uses a laser to analyze glucose levels through the skin. Making this technology portable could provide simple, continuous monitoring.


Measuring white blood cells
Chemotherapy reduces a patient's white blood cells and if they get too low, it can result in infections and cause delays in a patient's cancer treatments. A new, portable, non-invasive imaging device allows chemo patients to determine from home whether they are at serious risk of infection. This could prevent more than 100,000 infections per year and make cancer treatment more successful.


Continuous blood pressure monitoring
Blood pressure varies through the day and shifts along with stress but an arm cuff only captures a single measurement at a single moment in time, and is not the most accurate predictor of risk for serious health problems. A new, wearable ultrasound patch can measure central blood pressure in the aorta, which is more accurate than the arm and can provide continuous monitoring even overnight because it is small and can flex with the body. The patch would enable earlier, more effective detection and treatment of heart disease and stroke risk.
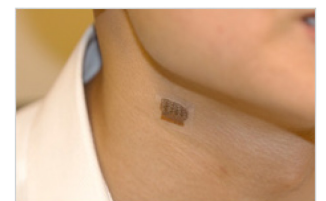
Fast, pain-free breast scan

Up to 50 percent of women skip mammograms because of the pain. A new painless, 15-second scan uses harmless laser light and sound waves instead of radiation to get the image and does not require breast compression. This technology could provide a powerful and accessible new approach that revolutionizes breast cancer detection and treatment.
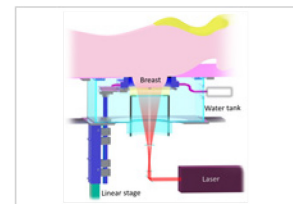
Prosthetics with a sense of touch

Current hand prosthetics do not provide a sense of touch. In a new approach, surgeons implanted fine wires in a patient's limbs and sensors in the prosthetic hand that provide a natural sense of touch and better control of the prosthesis. It could help users perform daily tasks, increasing their independence, productivity, and quality of life.

Collaborations

Brain Research through Advancing Innovative Neurotechnologies® (BRAIN) Initiative. Supports research to accelerate the development and application of innovative technologies that will produce a new dynamic picture of the human brain and the complex interaction of cells and circuits within the brain.

Helping to End Addiction Long-term℠ (HEAL) Initiative. Supports research to address the opioid crisis and develop effective and safe non-opioid options for pain management. NIBIB is focusing its efforts on supporting the development of medical devices to treat pain.

Harnessing Data Science for Health Discovery and Innovation in Africa. Leverages data science technologies and prior NIH investments to develop solutions to the continent's most pressing public health problems through a robust ecosystem of new partners from academic, government, and private sectors.

Stimulating Peripheral Activity to Relieve Conditions (SPARC). Serves as a community resource that provides the broader public and private research communities with the scientific foundation necessary to advance neuromodulation therapies toward a precise neural control of organ function to treat diseases and conditions.

Point-of Care Technologies Research Network (POCTRN). Develops technologies and information sharing tools that are inexpensive, easy-to-use, portable, and provide timely health status information about patients at the point of care.

Blueprint for Neuroscience Research. Collaborative framework that support research on the nervous system. By pooling resources and expertise, Blueprint identifies cross-cutting areas of research and confronts challenges too large for any single Institute or Center.

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