

Selected Research Centers

Laboratory for Laser Energetics

This research facility features the Omega laser—capable of delivering more than a petawatt (a million billion watts) of power onto a millimeter scale target. Scientists at the laboratory are working to mimic the very same thermonuclear fusion reactions occurring in our sun, and all other stars, that produce vast amounts of energy. This provides a unique resource for University researchers and collaborators.

Center for Electronic Imaging Systems

The Center for Electronic Imaging Systems is one of fourteen NYSTAR-sponsored Centers for Advanced Technology devoted to enhancing general economic growth in New York State by promoting technology transfer from Universities to Industry.

Rochester Center for Biomedical Ultrasound

The Center offers a unique environment to investigate the use of very high frequency sound waves in medical diagnosis, along with other medical imaging and bioeffects research.

Center for Future Health

This is a multidisciplinary research laboratory where physicians, engineers, and scientists create advanced medical technology on a personal scale.

Rochester Center for Brain Imaging

The goal of the Rochester Center for Brain Imaging is to provide researchers at the University of Rochester, as well as neighboring institutions, with access to a state-of-the-art 3T magnet for research using magnetic resonance imaging (MRI).

Center for Visual Science

An internationally renowned research group, the Center is dedicated to understanding the neural basis of vision.



Additional information on University of Rochester research programs and centers is available at: <http://www.rochester.edu/research/>

Learn more about science and technology initiatives at the University of Rochester and opportunities for partnerships.

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Science Research Innovation



The [University of Rochester](#) is a private research university with core strengths in several areas of science, engineering, and medicine. Over the last five years, sponsored research funding has averaged over \$350 million per year and the University of Rochester consistently ranks among the top universities in royalty revenue.

University of Rochester Medical Center

Several University of Rochester Medical Center departments rank among the nation's top 10 in NIH funding and the School of Medicine and Dentistry ranks among the top 25 percent of medical schools in NIH research funding.

Integrated Disease Programs

The Medical Center has five major Integrated Disease Programs, focusing research, teaching, and patient care services on the conditions that plague large segments of our population.

- Cancer
- Cardiovascular Disease
- Immunology and Infectious Disease
- Musculoskeletal Disease
- Neuromedicine



Innovative Science Programs

Within the School of Medicine and Dentistry, four Innovative Science Programs, which represent emerging research areas, will catalyze discoveries within the signature programs. Several programs integrate research across the University.

- Stem Cell and Regenerative Medicine
- Biomedical Imaging and Biomarkers
- Nanomedicine
- Genomics and Systems Biology

Clinical and Translational Science Institute

The University of Rochester Clinical and Translational Science Institute (CTSI) is a national leader in the expanding field of clinical and translational research. The University was one of the first institutions to receive this \$40 million dollar award from the NIH. The goals of the CTSI include: increased funds for pilot projects and faculty training; enhanced services for data management, computer simulation, biostatistics, epidemiology, research ethics, and community

involvement; new graduate degree programs in clinical and translational science; and the formation of a network of hospitals and biomedical research institutions in Upstate New York whose members will collaborate on projects and share resources.

Aab Cardiovascular Research Institute

The overall goal of the institute is to understand how the cardiovascular system develops and responds to physiological and pathological changes. Core areas of research include vascular and developmental biology, response to ischemic injury, electrophysiology and ion channels, molecular pharmacology, and signal transduction; and genetics of cardiovascular disease.

James P. Wilmot Cancer Center

The Cancer Center provides care, conducts significant cancer-related research, translates advances in the basic sciences into meaningful cancer treatments, and provides postdoctoral education.

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Science and Engineering

Optics and Visual Sciences

Optics, imaging, and visual sciences have a long tradition at the University. [The Institute of Optics](#), one of the first of its kind, is designed to provide the finest educational and research experience in Optical Physics, Applied Optics, and Optical Engineering. In addition, the [Department of Brain and Cognitive Sciences](#) has a nationally recognized team of researchers focused on understanding how the brain and visual systems develop, are organized, function, and respond to damage.

Alternative Energy and Emerging Technologies

An [Energy Research Initiative](#) was recently established to solve the problems of energy efficiency, storage and creation. Students, faculty, and staff from [Chemical Engineering](#), [Electrical/Computer Engineering](#), [Mechanical Engineering](#), the [Institute of Optics](#), and the [Laboratory for Laser Energetics](#) will tackle research and development issues at the core of alternative energy. They will go beyond traditional engineering efforts by working



with Arts and Science programs such as Political Science and Economics, in an effort to understand the social, political, and economic impact of energy concerns.

The University of Rochester is also able to capitalize on the unique strength of the Laboratory for Laser Energetics to develop alternative fuels and technologies.

Nanoscience

Nanoscience is a multidisciplinary domain and the University has recently established a Nanosystems Initiative. The Nanosystems Initiative, including the development of a nanotechnology research center, focuses on developing fuel cells and biosensors—two areas that are expected to see tremendous growth in the near future.

Additionally, through critical collaborations in the School of Medicine and Dentistry, the University is expanding existing nanoscience research to focus on emerging medical applications. [Nanomedicine](#) is a relatively new, but growing, field in which the University is well placed to make an impact.

Biomedical Engineering

The Biomedical Engineering Department brings together the technical expertise of the School of Engineering and Applied Sciences, with the clinical experience of the University of Rochester Medical Center, to establish a cooperative environment that fosters innovations in medicine and healthcare.



Electrical and Computer Engineering

Exceptional research in this area includes multidisciplinary research in machine learning, communications, and network solutions, as well as broader initiatives in nanotechnology and energy research.

Computational, Physical, and Functional Biology

The University has developed programs to foster emerging domains between the biological, physical, and formal sciences, ranging from areas such as computational neuroscience to physical biology, to bioinformatics—opening up new areas of study in the formal and physical sciences, and bringing powerful new approaches to the study of biological problems. One area of focus is identifying the function of genes through comparative and functional genomics.