

RUTGERS GROWS THE GARDEN STATE

Rutgers, The State University of New Jersey is the premier comprehensive public research university in the state's system of higher education. As such, Rutgers conducts innovative research that contributes to the medical, environmental, social and cultural well-being of the state, as well as contributing significantly to the economy and the state's businesses and industries.

With 31 schools and colleges, more than 100 undergraduate majors, over 200 graduate programs and degrees and nearly 300 research centers and institutes, Rutgers teaches to the highest standards of excellence, conducts groundbreaking research and provides services, solutions, and clinical care that help individuals

and the local, national and global communities in which they live.

Rutgers researchers' success in attracting funding for research from government, corporate and other sources continues. In Fiscal Year 2016, research expenditures reached \$658 million, leading to job creation, new businesses and innovations that improve the quality of life. Faculty research produces new patents, licenses and startup companies that create jobs and stimulate New Jersey's economy.

Rutgers is a vital research partner for business and industry and invites collaboration, technology commercialization and student recruiting opportunities to help the Garden State economy grow.



RUTGERS' NEW HIGHLY RANKED SUPERCOMPUTER

Rutgers powered up its second supercomputer, "Caliburn," in the summer of 2016. Caliburn is ranked #2 among supercomputers at Big Ten universities and #8 at U.S. academic institutions, according to the June 2016 Top500 list. The system, designed and managed by the Rutgers Discovery Informatics Institute, can perform over 675 trillion operations per second. It provides state-of-the-art computing and data capabilities to faculty, researchers and students. A \$10 million State of New Jersey grant funded the project. The supercomputer is also available to researchers from other New Jersey academic institutions, as well as industry, through a partnership between Rutgers and the N.J. Big Data Alliance.



VISIKOL – STUDENT-FOUNDED STARTUP

Visikol Inc., a student-founded biotech startup from Rutgers—New Brunswick that markets a product for use in scientific and medical research, recently won a \$255,000 Small Business Innovation Research grant from the NSF to further develop its skeletal visualization technology. The company was awarded a \$500,000 commitment from the Foundation Venture Capital Group in 2016. Visikol sells a versatile clearing agent, a chemical formula that renders animal and plant tissues transparent, allowing researchers to effectively visualize biological tissues in 3D, instead of the traditional 2D slicing visualization approach. This saves time, reduces structural damage to samples and enables more information to be gathered from tissues.



GRAPHENE COOLING

Rutgers researchers have discovered a powerful way to cool tiny chips – key components of electronic devices with billions of transistors apiece – with graphene. According to a Rutgers-led study published recently in Proceedings of the National Academy of Sciences, shrinking of electronic components and the excessive heat generated by their increasing power has heightened the need for chip-cooling solutions. By using graphene combined with a boron nitride crystal substrate, Board of Governors professor of physics Eva Y. Andrei and her team demonstrated a more powerful and efficient cooling mechanism. "We've achieved a power factor that is about two times higher than in previous thermoelectric coolers."

TRANSFORMATIVE CHANGES – BRICKS AND MORTAR

Rutgers 2030 Physical Master Plan includes the creation of exceptional learning environments for our students and the construction of state-of-the-art research facilities to support transformational research in service to New Jersey and beyond. Important examples of near-term projects include:



A new **Chemistry and Chemical Biology Building**, New Brunswick Campus – to open in 2017 – state-of-the-art facility to serve and train the next generation of globally-engaged scientists and support the needs of the chemical industry.



A new **Nursing and Science Building**, Camden Campus – to open in 2017 – a state-of-the-art research and teaching facility for undergraduate, graduate and doctoral programs.



The new **Richard Weeks Hall of Engineering**, New Brunswick Campus – to open in 2018 – will create a world-class, signature "Engineering Gateway" facility to support research initiatives and assert Rutgers' commitment to sustainability and cross-disciplinary engineering collaborations.



An expanded **Life Science Building**, Newark Campus – to open in 2017 – physically link existing facilities and provide opportunities for synergy among all Life Science departments by creating shared core functions, and flexible research space for existing and potential programs.

NEW BLOOD TEST TO DETECT CANCER

A team of researchers, including Fred Kramer, Salvatore Marras, Sanjay Tyagi and Diana Vargas-Gold at the Public Health Research Institute, a unit of the New Jersey Medical School, has developed a technique using inexpensive SuperSelective gene amplification assays to detect the presence of cancer. A routine blood sample taken during a person's annual medical checkup can be used to simultaneously detect and identify approximately one hundred different somatic mutations associated with cancer anywhere in that person's body, even though no symptoms have yet occurred.

BREAKTHROUGH LEADS TO TWO NEW METHODS FOR FIGHTING TB

Tuberculosis (TB) kills 1.8 million people each year. A team of Rutgers researchers led by Richard H. Ebricht, Board of Governors professor of chemistry and chemical biology, has led to two breakthroughs. First, his lab has been able to determine the three-dimensional structure of the world's leading anti-TB drug, rifampin, bound to its target. Because new rifampin-resistant bacteria have spread widely, knowing the structure of the target will help the research community develop new TB treatments. Second, they have discovered an entirely new class of anti-TB compounds – "AAPs" – that potentially kill both rifampin-resistant and multi-drug-resistant TB bacteria.



RUTGERS RESEARCHERS GET RESULTS

(FY2015 and FY2016)

- ▶ 352 inventions disclosed
- ▶ 182 license agreements
- ▶ 309 total patents granted
- ▶ \$31.5 million in royalty income from patents/licensing
- ▶ 119 startup businesses
- ▶ 39 active spinoffs/startups in NJ

▶ Rutgers is a **Top 100 world university** and a **Top 25 US public research university**.

▶ Rutgers is a **member of the Big Ten Conference** and its academic counterpart, the Big Ten Academic Alliance.

▶ Rutgers **ranks #27** among the "Top 100 Worldwide Universities Granted U.S. Patents," according to the National Academy of Inventors.

▶ More than **69,000 students** come to Rutgers from all 50 states and over **120 countries**.

FAST FACTS

Read more about Rutgers' impact on the New Jersey economy in a recent economic impact report issued by the university – economicimpact.rutgers.edu

Collaborate With Rutgers: Rutgers' Corporate Engagement Team offers a website for industry – businessportal.rutgers.edu. Find experts & information on collaborative research, licensing technology, professional development programs & recruiting students.