

ENGINEERING FOR HEALTH



UVA Engineering researchers believe that new methods to prevent, diagnose, treat and cure disease are within humanity's grasp. UVA is uniquely positioned to reach a better future for health care because we create knowledge and technologies at the intersection of medicine and engineering.

Core Research Competencies Include:

- Biomechanics and Mechanobiology
- Biomedical and Molecular Imaging
- Biomedical Data Sciences and Systems Biology
- Biomolecular Systems
- Clinical and Translational Science
- Smart Health
- Tissue Engineering and Biomaterials (Regenerative Bioengineering)

Application Areas Include:

- Injury Prevention
- Manufacturing Human Tissues and Organs
- Mining Big Data for Diseases such as Alzheimer's, Cancer and Fibrosis
- Targeted Drug and Gene Delivery
- Wireless Monitors and Smartphone Apps for Health Care

KEY FACTS ABOUT UVA'S CONTRIBUTIONS TO HEALTH CARE:

#1

HOSPITAL IN VIRGINIA

ACCORDING TO U.S. NEWS &
WORLD REPORT'S
"BEST HOSPITALS" GUIDE



1 OF 8

UNIVERSITIES IN THE COUNTRY WITH
CO-LOCATED, TOP-RANKED SCHOOLS
OF ENGINEERING AND MEDICINE



\$20 MILLION

COULTER TRANSLATIONAL PARTNERSHIP PROGRAM

DESIGNED TO MOVE INNOVATIVE TECHNOLOGIES FROM RESEARCH
TO CLINICAL APPLICATION TO COMMERCIALIZATION

14 STARTUPS

10 LICENSES TO INDUSTRY

\$40 MILLION IN NATIONAL INSTITUTES OF HEALTH FUNDING

HAVE RESULTED FROM THE COULTER TRANSLATIONAL PARTNERSHIP OVER THE LAST DECADE

AFFILIATED RESEARCH CENTERS AND INITIATIVES:

BIOCOMPLEXITY INITIATIVE

UVA has established a statewide, multi-site Biocomplexity Initiative that employs the principles of interdisciplinary team science to solve complex, multidimensional problems in medicine and society. The initiative is led by Chris Barrett, a global leader in applying computer science concepts and tools to making new discoveries in complex systems involving human health, habitat and well-being. The Biocomplexity Initiative's high-performance computing capabilities will help researchers explore the relationship between human genomics, social and behavioral determinants of health, and environmental influences in the ways in which diseases manifest.

CENTER FOR APPLIED BIOMECHANICS

As the largest university-based injury biomechanics laboratory in the world, the center specializes in impact biomechanics for injury prevention. Started by the National Highway Traffic Safety Administration in 1989, the center operates in a 30,000-square-foot facility located in the University of Virginia Research Park. It is recognized as one of the world's leading research groups in the field, using state-of-the-art equipment to analyze the intricacies of how the human body responds to injury.

CENTER FOR ADVANCED BIOMANUFACTURING

The center supports collaborative research focused on developing innovative regenerative materials, with a focus on advancing the knowledge and technologies that will be needed to eventually manufacture tissue, muscles and organs on a national scale. The center brings together UVA's technical expertise in advanced manufacturing, biomaterials synthesis, biomechanics, mechanobiology, multiscale modeling, imaging, orthopedic clinical translation, and rehabilitation. A central application focus is the improved treatment of the otherwise irrecoverable muscle injuries that result from disease, trauma or congenital defects.

CENTER FOR ENGINEERING IN MEDICINE

Many of the innovative approaches to complex medical problems are emerging at the interface between engineering and medicine. UVA has critical strategic advantages in this area, including the physical proximity of the schools of engineering, medicine, and nursing, and an established culture of interdisciplinary collaboration. The Center for Engineering in Medicine, established in 2017, expands the scope of engineering-medicine efforts at Virginia's top health system, involving more than 200 engineers and clinicians from more than 30 departments across the University.

UVA SCHOOL OF DATA SCIENCE

Building upon the groundbreaking work of the Data Science Institute that was established in 2013, the University of Virginia has announced a \$120 million gift to establish a new school of data science. The school will support research and workforce development through undergraduate and graduate degrees in the field of data science, which has become a critical new frontier in efforts to solve global health care challenges. University researchers already are applying big data insights in areas ranging from autism to pediatric health to drug design and delivery.



INDUSTRY SECTORS:

BIOTECHNOLOGY

PHARMACEUTICALS

HEALTH INFORMATION TECHNOLOGY

MEDICAL TECHNOLOGIES AND DEVICES

BIOMANUFACTURING

SMART HEALTH