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Shaping the future through transformative innovation

VCU is uniquely positioned to shape the future through transformative innovation. Our faculty, staff, trainees and students are a talented and engaged driving force, reflective of our diverse, urban community. We collaborate to bring creative solutions where others see boundaries. Our creativity and innovation are integrated with community values and the entrepreneurial ecosystem that surrounds us. Every day, our faculty researchers shape the future through their teaching and training of undergraduate and graduate students, post-docs and other trainees, as well as through engaging in numerous efforts to enrich the lives of those in our local community and finding new and potential solutions to society’s grand challenges.

Among our many ongoing efforts to shape the future that are bearing fruit now the birth of a liver institute late in 2021 has led to VCU’s largest donation ever (https://bit.ly/3Lu8Qlw) to support treatment and research; and the renaming of a $100 million initiative to increase diversity in clinical trials in honor of the VCU Massey Cancer Center’s director (https://bit.ly/3L8rnme), whose work regarding health equities is nationally recognized, and much more.

The One VCU Research fosters our transdisciplinary culture across our diverse campuses and disciplines to achieve public impact across the region, the state, the nation and the globe. We are built for breakthroughs.
Shaping the future

The One VCU Research Strategic Priorities Plan is our blueprint for transformative innovation. Through our inclusive culture of collaboration, engaged community and creativity, we focus on delivering results that make a difference, addressing today’s real-world challenges. These are the challenges that are sometimes hard to see clearly, solve easily or make sustainable. This is where we make breakthroughs happen.

We do this by investing in our strengths, our community-partnered success, our transdisciplinary impact areas focused on enriching the human experience, achieving a just and equitable society, optimizing health and supporting sustainable energy and environments.

In 2021, VCU entered the first two-year phase of this university-wide, six-year plan, with investment commitments to advance public impact research priorities. The plan aligns with our mission and our vision as well as the forthcoming recalibration of the university’s overall strategic plan.
The One VCU Research Strategic Priorities Plan

One VCU Research fosters our transdisciplinary culture across our diverse campuses and disciplines to produce transformative innovation with public impact. We collaborate to bring creative solutions where others see boundaries. The breadth of our scholarship across disciplines addresses local challenges with our community partners to deliver bold and practical solutions with global implications. These are our research initiatives:

**Enriching the human experience**

**Achieving a just and equitable society**

**Optimizing health**

**Supporting sustainable energy and environments**
THE ONE VCU RESEARCH STRATEGIC PRIORITIES PLAN

New internal funding opportunities for faculty

VCU research flourishes by changing the game. We are highly creative and passionate about our community, with a great breadth of knowledge. To help facilitate growth of knowledge and research, the OVPRI released four funding opportunities, including a joint funding opportunity with the Provost’s office:

- Arts, humanities and social sciences fund (https://bit.ly/3L8sfr0)
Current research rankings

- School of the Arts (2nd among public institutions)*
- Pharmacology**
- Addiction***
- School of Dentistry**
- School of Pharmacy**
- School of Social Work*
- School of Education*
- School of Nursing**
- Among U.S. Public Research Universities****
- School of Medicine**

* VCU graduate schools ranked in the top 50 by USN&WR
** Blue Ridge Ranking
*** NIH RePORTER
**** NSF HERD ranking among public universities
National research rankings

- 12 in liberal arts and other non-science disciplines
- 33 in health sciences
- 44 in life sciences
- 32 in psychology
- 38 in Department of Health and Human Services funding
- 50 in biological and biomedical sciences
2021 Record external sponsored funding

Year after year, VCU research breaks its own external sponsored funding records

- **$363 million** Sponsored program awards
- **$56 million** State awards
- **$57 million** Industry awards
- **$165 million** Federal awards
- **$85 million** Other (foundation, gifts)
FY2021 Sponsored program areas - up 8% over FY2020

*in millions of dollars

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Clinical research

$34 million - up 26% over previous year

- 5,732 Total active participants enrolled in clinical research
- 36 VCU faculty-held FDA applications for new drugs/devices
- 650 Active clinical trials at VCU / VCUHS
- 1,015 Active clinical studies
- 133 Investigator-initiated trials
Bringing ideas to life - VCU Innovation Gateway

10 years of impact

>30 million
Licensing revenue

$80 million
Startup funding

172
Licenses / options

49
Products to market

1,213
Invention disclosures

192
Patents issued

60+
Startups

>1,540
Patents filed
VCU’s notable honors

Fellows
Supriyo Bandyopadhyay, Ph.D., Jefferson Science Fellow, National Academies of Sciences, Engineering and Medicine
Barbara D. Boyan, Ph.D., fellow, Orthopaedic Research Society
Krzysztof Cios, Ph.D., fellow, Asia-Pacific Artificial Intelligence Association
Henry J. Donahue, Ph.D., fellow, Orthopaedic Research Society
Milos Manic, Ph.D., fellow, Institute of Electrical and Electronics Engineers; president-elect, IEEE Industrial Electronics
Amy Salisbury, Ph.D., fellow, American Academy of Nursing

Shelly Smith, DNP, fellow, American Academy of Nursing
Shawne Soper, DPT, Worthingham Fellow, American Physical Therapy Association
Sarah Spiegel, Ph.D., international fellow, American Society for Biochemistry and Molecular Biology
Gary Tepper, Ph.D., fellow, International Association of Advanced Materials
Bennet Ward, Ph.D., fellow, National Academy of Inventors
Cang Ye, Ph.D., fellow, American Institute for Medical and Biological Engineering

Others
Dipankar Bandyopadhyay, Ph.D., Outstanding Statistical Applications Award, American Statistical Association
Sompop Bencharit, D.D.S., Ph.D., distinguished researcher award, American College of Prosthodontists
David Cifu, M.D., Magnuson Award for Outstanding Achievement in Rehabilitation Research and Development, U.S. Department of Veterans Affairs
Jose Cortina, Ph.D., distinguished career award, Academy of Management Research Methods Division
Susan Gooden, Ph.D., president, Network of Schools of Public Policy, Affairs and Administration
Robert Winn, M.D., inaugural Cancer Health Equity Award, Association of American Cancer Institutes
Rosalyn Hobson Hargraves, Ph.D.

VCU Engineering professor to lead National Science Foundation’s Division of Undergraduate Education (https://bit.ly/3N5I9om)

Hargraves will serve at the NSF for up to four years as its director of the Division of Undergraduate Education. She is a professor of electrical and computer engineering in VCU’s College of Engineering and is a recognized leader in advancing equity, excellence and inclusion in STEM education.

Arnethea Sutton, Ph.D.

Among the researchers First Lady Jill Biden, Ed.D., met while visiting the Massey Cancer Center, was Sutton, who spoke about her research on disparate survivorship of minorities with cancer. Sutton, a postdoctoral fellow in the Department of Health Behavior and Policy at the School of Medicine, had a remarkable 2021. In addition to meeting the First Lady, she received a prestigious NIH K99 grant to study health disparities in breast cancer and was declared a “wunderkind,” one of the 27 “most impressive doctors and researchers on the cusp of launching their careers” by the news site STATnews.com. She is the first from VCU to win this honor.
VCU's notable honors, continued

New Stravitz-Sanyal Institute for Liver Disease and Metabolic Health


VCU’s new Institute for Liver Disease and Metabolic Health, under the leadership of liver disease specialist and researcher Arun Sanyal, will build on the success of VCU’s nationally recognized hepatology and liver transplant programs.

The institute will make VCU a global leader in research and education about liver diseases and metabolically driven disorders and in the care for patients with these conditions.

VCU named National Center of Academic Excellence in Cyber Research


The National Security Agency and the Department of Homeland Security have designated VCU as a National Center of Academic Excellence in Cyber Defense Research. The CAE program promotes higher education and research in cyber defense to reduce vulnerability in the national information infrastructure.

The designation reflects VCU’s highly interdisciplinary approach to cybersecurity research, which includes its computer science, electrical and computer engineering, information systems and homeland security and emergency preparedness departments.
VCU's Notable Honors

A legacy of learning


With a recent renewal, VCU’s Department of Pharmacology and Toxicology’s T32 training program has secured 50 years of continuous funding from the National Institute on Drug Abuse. Since the grant was initially awarded, it has provided more than 600 student or trainee years of funding, which includes money for tuition, equipment and supplies.

Bill Dewey, Ph.D., first secured the T32 grant in 1976 and has been able to renew it every five years since. This funding source has provided over $24 million in support for students and trainees.
VCU’s notable honors, continued

Federal career development and recognition awards

**National Institutes of Health Research Career Development Awards**

- **Caitlin Martin, M.D.**, director of OB/GYN Addiction Services in the Department of Obstetrics and Gynecology, was given a Mentored Patient-Oriented Research Career Development Award (K23) from the National Institute on Drug Abuse.

- **Frank Raucci, M.D.**, associate professor, Division of Pediatric Cardiology, holds a Mentored Clinical Scientist Research Career Development Award (K08) from the National Heart, Lung, and Blood Institute.

**National Science Foundation Faculty Early Career Development (CAREER) honors**

- **Carlos Castano, Ph.D.**, assistant professor, Department of Mechanical and Nuclear Engineering, College of Engineering, received his NSF award from the advanced manufacturing program of the Division of Civil, Mechanical and Manufacturing Innovation (CCMI).

- **Fantasy Lozada, Ph.D.**, assistant professor, Department of Psychology, College of Humanities and Sciences, received her award from the NSF Division of Behavioral and Cognitive Sciences.

- **Catherine Hulshof, Ph.D.**, assistant professor, Department of Biology, College of Humanities and Sciences, received her award from the NSF Division of Environmental Biology.

- **Jennifer Puetzer, Ph.D.**, assistant professor, Department of Biomedical Engineering, College of Engineering, received an award from the NSF biomechanics and mechanobiology program in the CMMI division.
VCU STUDENT RESEARCH

VCU undergraduate research symposium

Following COVID's disruption to campus life, including the in-person recognition of student research, VCU earlier this year resumed its undergraduate research symposium. There were 231 presenters, with representation from every department and discipline.

"It was extraordinarily fulfilling to host the return of our in-person annual VCU Poster Symposium for Undergraduate Research and Creativity after a two-year hiatus during COVID. Research may have faced delays, setbacks and unprecedented challenges during the past two years, but it never stopped at VCU. That's a testament to the perseverance and unbounded passion for inquiry on the part of our students and faculty" — Herbert H. Hill, director of undergraduate research and creative inquiry.
VCUARTS QATAR

Shaping the future

https://qatar.vcu.edu/

VCUarts Qatar contributes to the human, social, economic and environmental development of Qatar and the region by educating creative problem solvers and art makers.

The faculty’s influences on their society are significant, through the education they offer as well as through their research measures. Their research is relevant, not only to their region, but also more broadly across many fields: materials science and nanotechnology to artificial intelligence and advancing pedagogy through research.

Read more about the school's collaboration with Qatar’s Ministry of Public Health: https://bit.ly/3yzlSKG
Enriching the human experience

Modernizing white canes


Improv and homelessness

Elizabeth Byland (top right, middle) (https://bit.ly/3Ck0YOq)

Addressing youth violence

Nicholas Thomson, Ph.D. (bottom right); Terri Sullivan, Ph.D. (bottom left) (https://bit.ly/3I3cFCe)
Achieving a just and equitable society
Combating inequities in lung cancer

Conversations during crisis

Segregation in education
Genevieve Siegel-Hawley, Ph.D. (bottom right) (https://bit.ly/3Na2iIN)
Optimizing health

Fighting the opioid crisis
Caitlin Martin, M.D. (top left) F. Gerard Moeller, M.D. (top right) (https://bit.ly/3jQ1b7I)

Treating triple-negative breast cancer

Tackling sickle cells
Martin Safo, Ph.D. (bottom left) (https://bit.ly/3wp5R7d)
Supporting sustainable energy and environments

Breeding ecology of prothonotary warblers

Tracking air quality

Renewable hydrogen
Ram Gupta, Ph.D. (bottom left) (https://bit.ly/3Qce3kz)
Designation of new VCU-wide research institutes and centers

Following a review in 2021, nine new institutes and centers earned the designation as a university-wide “VCU Research Institute and Center.” These facilities were recognized for not only advancing VCU’s overall research funding and enterprise, but for fostering increased collaborative research among various schools and colleges and across our campuses and overall impact.

- Center on Health Disparities (https://healthdisparities.vcu.edu/)
- Center for Rehabilitation Science and Engineering (https://pmr.vcu.edu/research/)
- Center on Society and Health (https://societyhealth.vcu.edu/)
- Clark-Hill Institute for Positive Youth Development (https://clarkhill.vcu.edu/)
- Institute for Drug and Alcohol Studies (https://idas.vcu.edu/)
- Institute for Research on Behavioral and Emotional Health (http://cobe.vcu.edu/)
- Institute for Women’s Health (https://womenshealth.vcu.edu/)
- Partnership for People with Disabilities (https://partnership.vcu.edu/)
The Mid-Atlantic Twin Registry
matr.vcu.edu

Based in the Office of the Vice President for Research and Innovation at VCU, the Mid-Atlantic Twin Registry plays a role in research across many disciplines and topics, including the heredity of alcohol and drug abuse, psychiatric outcomes of bullying victimization, depression in women, childhood behavioral problems and the long-term biological consequences of sexual assault.

With more than 50,000 participants, the Mid-Atlantic Twin Registry is the largest twin registry in the United States and one of the largest in the world. Twins and other multiples who participate offer researchers the opportunity to study “nature versus nurture.”

“As a natural experiment, MATR twins enable us to study the interplay of both nature and nurture, transforming the way we understand complex genetic and environmental influences on mental and physical health,” said Judy L. Silberg, Ph.D., scientific director of MATR.

In addition to pairing twins with researchers, the MATR also supports research projects by carrying out data collection, project coordination, institutional review board submissions and providing grant applications support. Learn more about the MATR online or by emailing matr@vcu.edu.

Read how the registry is supporting cancer research at VCU: (https://bit.ly/3wa26nt)