

Transforming Medicine: The Scientist Physician

Robust research. Innovative learning.
Impactful service. Inclusive excellence.



A UNIQUE PARTNERSHIP AND PURPOSE.

The Virginia Tech Carilion School of Medicine welcomed its first class in 2010. The unique public-private partnership formed and thrived thanks to alignment of motto and mission with Virginia Tech's motto of *Ut Prosim* (That I May Serve) and Carilion Clinic's mission to improve the health of the communities it serves.

"Our students are excelling in their medical education through problem-based learning structured around real patient cases," said Richard Vari, senior dean for academic affairs and creator of the curriculum. "Through our four robust curricular domains, we're helping them not only to be good students, but to become great physicians."

Curricular Domains



Basic Science



Clinical Science



Research



Health Systems Science
and Interprofessional
Practice





“Our graduates leave with extensive research training and a critical understanding of the systems that influence the health of our patients and the care they receive. We prepare them to become systems-minded physician thought leaders who can translate research from bench to bedside, engage with interprofessional teams, and positively impact the systems and communities in which they practice.”

- Dean Lee Learman



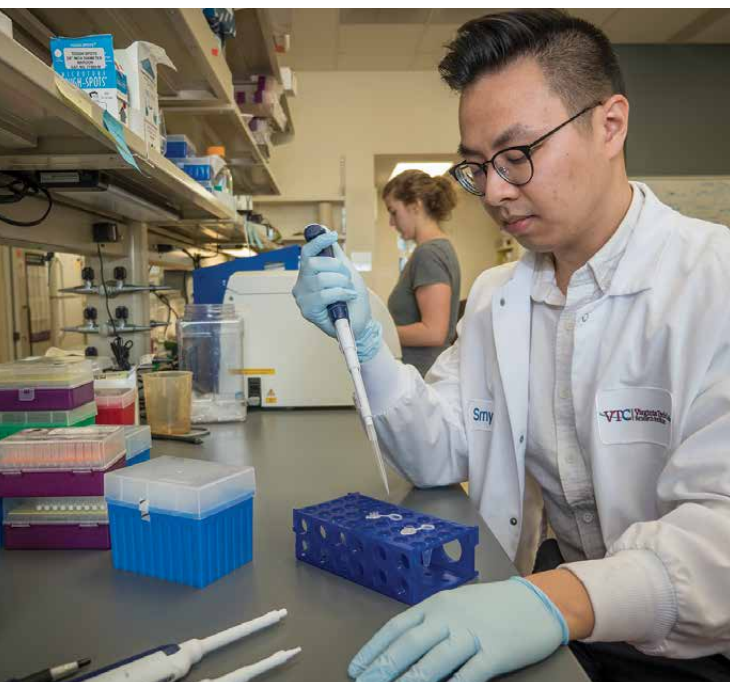


CREATING SCIENTIST PHYSICIANS

To truly create the next generation of physician thought leaders, the Virginia Tech Carilion School of Medicine has a disciplined focus on research, so its graduates are equipped to conduct and use research effectively in their practice.

- Hypothesis-driven research project required
- Research curriculum embedded across four-year curriculum
- Supported by world-renowned research mentors
- Research focus supported ranking of 83 (tied) out of 123 ranked schools (191 total) in U.S. News & World Report's 2022 survey.

“Overall, we are ranked high as a newer school largely competing with schools with longer legacies,” said Dean Lee Learman. “Our top-notch graduates are now ambassadors for us across the country in residencies, fellowships, and now some in private practice, and our reputation is on the rise.”





In 2021, Oscar Alcoreza (below) became our first student to earn a Ph.D. through Virginia Tech's Translational Biology, Medicine, and Health program. Our second student to follow this path, Kenneth Young (left), expects to earn his Ph.D. in 2023 before returning to medical school.



Medical Student Research Success



115+
publications with
VTCSOM students*

400+
regional
and national
presentations*



In **2020-21**,



there were **9** student
publications
with **4** as first authors

*From the first seven graduating classes
(284 students)



“We fill a critical need in the country. Even with all the algorithms and electronic medicine, electronic health records, and today’s computational capabilities, we need people who understand the science of medicine and are ready for the next big changes. Our graduates are ready.”

- **Michael Friedlander**, vice president for health sciences and technology at Virginia Tech and senior dean for research at the medical school

MAKING TRANSFORMATIVE DISCOVERIES.

As one of the nation's fastest-growing research enterprises, the Fralin Biomedical Research Institute at VTC is closely aligned with the medical school and is a destination for world-class biomedical scientists and graduate students. The institute's primary investigators are motivated to address the leading causes of death and suffering in the United States, including brain disease, cardiovascular disease, infectious pathogens, and cancer. In just 10 years, the research institute has experienced unprecedented growth: doubling its enterprise and lab facilities in Roanoke, while also securing laboratory space on the Children's National Research & Innovation Campus in Washington, D.C. to expand Virginia Tech's Cancer Research Alliance and study pediatric brain and spinal cord cancers.





Michael Friedlander is Virginia Tech's vice president for health sciences and technology, founding executive director of the Fralin Biomedical Research Institute, and the Virginia Tech Carilion School of Medicine's senior dean for research.

He is a fellow of the American Association for the Advancement of Science, and served on the Association of American Medical Colleges - Howard Hughes Medical Institute's task force on the Scientific Foundations of Future Physicians. Friedlander is a world-renowned neuroscientist, whose research program explores the cellular processes that underlie synaptic plasticity during brain development, learning, disease, and brain injury.



In FY20, Fralin Biomedical Research Institute faculty who have affiliations with the School of Medicine received

\$28 million

in extramural awards.



**FRALIN BIOMEDICAL
RESEARCH INSTITUTE AT VTC**
VIRGINIA TECH.



“It’s fundamental for medical doctors to understand the science behind the medicine to provide the best possible patient care. At the Virginia Tech Carilion School of Medicine, we’re training physicians who routinely utilize, apply, and communicate scientific reasoning in their practice, who are motivated to learn about and advocate for emerging scientific advances in medicine, and who, ultimately, bridge the gap between the bench and the clinic by communicating with scientists.”

- Michael Friedlander

➤ READY FOR THE HEALTH CARE OF THE FUTURE

“Most medical students leave medical school well prepared to advance their medical knowledge and clinical skills during residency,” said David Musick, senior dean for faculty affairs. “But most do not know a lot about the context in which they’re going to actually put those clinical skills to work.”

To address this critical aspect of the health care system, the medical school recently expanded its interprofessional practice curricular domain to comprehensively include health systems science. The new curriculum features topics such as population health, quality and safety, health policy, health care finance, value-based care, informatics, and health disparities.

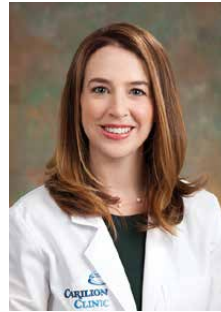
“Our students will emerge with a better understanding of the way health care is delivered and how to make a positive impact on the health of patients and populations.”

- Dean Lee Learman





Cynthia Morrow



Natalie Karp

Cynthia Morrow and Natalie Karp are the co-leaders of the Virginia Tech Carilion School of Medicine's new health systems science and interprofessional practice domain. Morrow is the health director of the Virginia Department of

Health's Roanoke and Alleghany Health Districts, a position that adds synergies among the health district, medical school, and other organizations to advance the health of our region and community.

"The HSSIP curriculum aims to prepare students to work in increasingly complex health care systems and optimally serve their patients and communities," said Natalie Karp, a urogynecologist and OB-GYN clerkship director.



Health Systems and Implementation Science



Sarah Parker

Sarah Parker, chair of the Department of Health Systems and Implementation Science, is an expert in the study of human factors in health care delivery. Her work uses a human factors perspective to improve patient safety and the quality of care, in collaboration with Carilion Clinic's Center for Simulation, Research, and Patient Safety. The Center provides state-of-the-art facilities and expertise for students, residents, faculty, and interprofessional teams, including:



- Skills lab with laparoscopic trainers
- Simulance, trauma bay, operating room, and adaptive patient room
- Mother/Baby pediatric simulation
- Team-based simulations and debriefings
- Human factors analysis to improve patient safety



DEDICATED TO SERVING COMMUNITIES NEAR AND FAR

Our students are passionate about serving the community. Every year, they give hundreds of hours of service caring for patients at the local free clinic, collecting donations for refugee, immigrant, and other underserved populations, mentoring students from backgrounds underrepresented in medicine to excite them about pursuing careers in science and medicine, and many more worthy causes.

To help mold this exuberant spirit of volunteerism into a streamlined effort, the medical school began VTCSOM Engage, which connects our students to vitally important service projects in the community, tracks their engagement activities, and provides opportunities to add meaning and value to their experiences through personal reflection and peer discussion.





REGIONAL IMPACT WITH A NATIONAL REPUTATION



What was once a small, regional health system has leapt onto the national scene as a transformative leader. “We had good, strong clinical care and graduate education. We had everything except a medical school,” said Nancy Howell Agee,

president and CEO of Carilion Clinic. The health system partnered with Virginia Tech to create the Virginia Tech Carilion School of Medicine as it transitioned to integrated care delivery and pioneered value-based payment. The changes propelled the \$2 billion not-for-profit health system headquartered in Roanoke, Virginia, into the national spotlight.

Agee was first named to Modern Healthcare’s biennial list of Top 25 Women Leaders in 2017 and is perennially among its 100 Most Influential People in Healthcare.

CARILION CLINIC *by the numbers*

7
Hospitals serving southwestern Virginia

788
physicians in
282
practice sites

100
Great Hospitals in America by Becker’s Hospital Review

815,454
primary care visits

1,026
licensed beds

150,076
emergency room visits (Level I Trauma Center)

60 NICU beds

Dick Davidson 2020 NOVA Award for Healthy Roanoke Valley by the American Hospital Association

13,500+
employees

Fiscal year 2020



➤ VALUING DIVERSITY AND ADVANCING INCLUSION

With a heightened national focus on diversity and inclusion efforts, the Virginia Tech Carilion School of Medicine is putting a priority on its own ways to foster positive change in our school, our community, and beyond.

Since our founding more than a decade ago, the Virginia Tech Carilion School of Medicine has explored what it means to value, support, and engage with our diversity, and how to disrupt systems that are antithetical to our commitment to equity, inclusion, and excellence.





InclusiveVTCSOM

The medical school recently launched InclusiveVTCSOM, an initiative to help us further this work. Its mission is to advance an inclusive environment that attracts and retains the best talent, values diversity of life experiences and perspectives, and encourages innovation in our pursuit of equity. medicine.vtc.vt.edu/diversity/taskforce.html

The school's efforts expand across the spectrum. Examples include special programs for underrepresented youth to help them get excited about STEM topics and interested in medicine as a career.



“Our collective efforts and shared commitment to equity, justice, and civility have gathered momentum, leading to us to sharpen our school’s focus on achieving ongoing progress in access, diversity, and inclusion.”

- Dean Lee Learman



CLASS OF '25

3531

Ave. Clinical Hours

3017

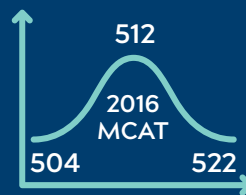
Ave. Research Hours

49

Students from
6,405 AMCAS
applications

3.58

Average GPA
3.2 (10th percentile) to
3.93 (90th percentile)



Representing 36
Undergraduate
Institutions



Underrepresented
Minorities



Socio-Economically
Distance Traveled



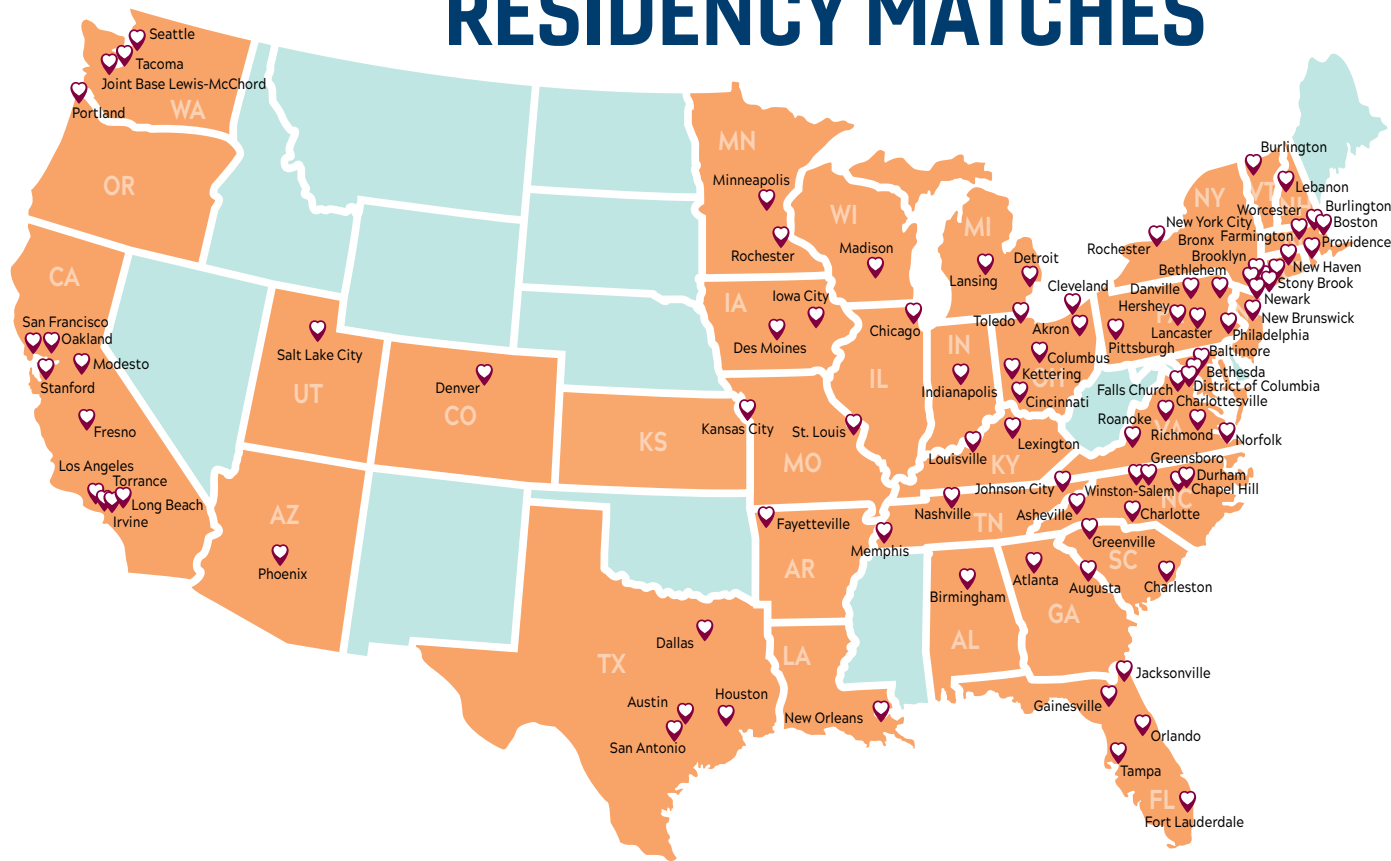
First Generation
College Students



45%
Male

55%
Female

RESIDENCY MATCHES



VTCSOM graduates from the first eight classes (2014-2021) matched to outstanding residency programs across the U.S., including Baylor University, Cornell University Weill Medical College, Duke University, Emory University, Icahn School of Medicine, Johns Hopkins University, Mayo Clinic Rochester, New York-Presbyterian/ Columbia University Medical Center, Northwestern University, Oregon Health and Science University, Stanford University, University of California San Francisco, University of Chicago, University of Colorado Denver, University of Minnesota, University of North Carolina, University of Pittsburgh, University of Texas Southwestern, University of Washington, University of Wisconsin, Vanderbilt University, Washington University, and Yale University.

Our graduates enter a wide range of popular and competitive specialties, including Anesthesiology, Dermatology, Emergency Medicine, Family Medicine, Internal Medicine, Neurology, Neurosurgery, Obstetrics and Gynecology, Ophthalmology, Orthopaedic Surgery, Otolaryngology, Pathology, Pediatrics, Physical Medicine and Rehabilitation, Plastic Surgery, Psychiatry, Radiation Oncology, Radiology, Surgery, and Urology.

RESIDENCY MATCH STATS

99%

of graduates from all eight classes have matched to residency

94%

of graduates match in their first-choice specialty

36

states plus District of Columbia where graduates matched with programs



Virginia Tech is an equal opportunity/affirmative action institution.

VTC | **Virginia Tech Carilion**
School of Medicine

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