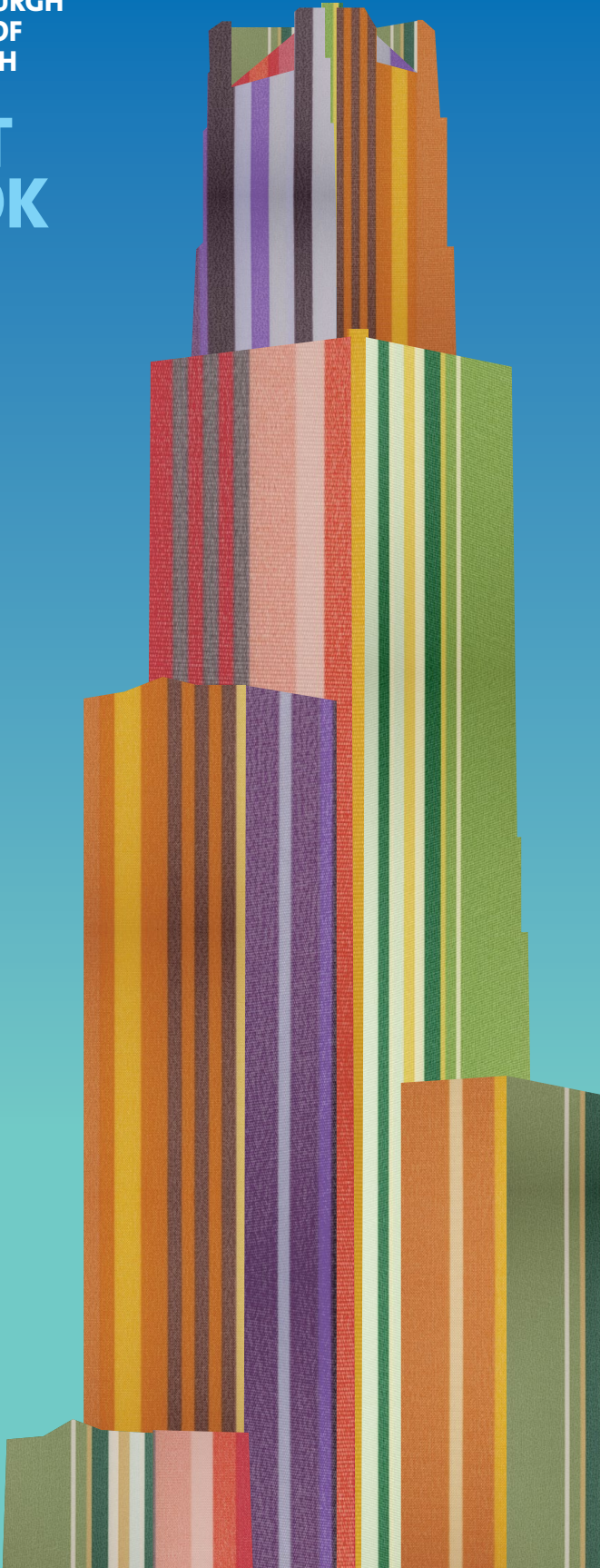


UNIVERSITY
OF PITTSBURGH
SCHOOLS OF
THE HEALTH
SCIENCES

FACT BOOK

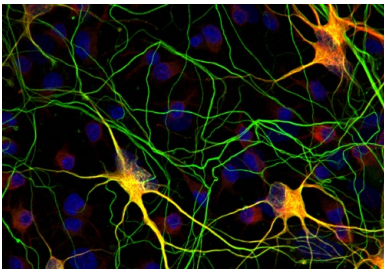


For more than a century,

the University of Pittsburgh has been a destination of distinction for health sciences education and research, a training ground producing dedicated professionals to serve the public good, and a wellspring of scientific discoveries to advance human health. With a proud legacy that includes Nobel laureates, the creators of the first safe and effective polio vaccine, and initiators of great leaps forward in organ transplantation, cancer treatment, neuroscience, immunology, ophthalmology, and many other arenas, the Schools of the Health Sciences are among the finest in the nation in their respective fields. I invite you to explore this publication for more information, but also to contact us and visit our vibrant campus to see the research and clinical innovations taking place here each and every day for yourself.

Arthur S. Levine, MD

Senior Vice Chancellor for the Health Sciences
John and Gertrude Petersen Dean of Medicine



**UNIVERSITY
OF PITTSBURGH
SCHOOLS
OF THE HEALTH
SCIENCES**

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OVERVIEW

The **University of Pittsburgh** is a state-related research university founded in 1787. Pitt is a member of the Association of American Universities, an organization of 62 leading doctorate-granting research institutions in the United States and Canada. The **University of Pittsburgh Schools of the Health Sciences** combine to make Pitt a major center for health sciences education and biomedical research.

IN 2017

\$528
MILLION
IN NIH
SUPPORT

\$765
MILLION
FOR
RESEARCH

RESEARCH FUNDING

Funding from the National Institutes of Health (NIH) is considered the benchmark of overall stature among research-intensive academic health centers. Since 1998, the University of Pittsburgh has ranked among the top 10 recipients of NIH funding.

In an analysis of **NIH funding** for federal fiscal year 2017, the faculty of the University of Pittsburgh ranks **fifth** in total grants awarded, with more than **\$528 million in funding** and approximately 92 percent of the total being awarded to the Schools of the Health Sciences. The University of Pittsburgh spent approximately \$765 million for research of all kinds in fiscal year 2017; nearly 80 percent of this amount was for research in the health sciences.

As a result of its success, Pitt has invested significantly in new research infrastructure in disciplines like immunology, ophthalmology, global health, mathematical biomedicine, informatics, modeling, the biology of aging, and in faculty recruitment.

FACILITIES

Overall, the six Schools of the Health Sciences currently occupy approximately **4.2 million gross square feet of research, academic, and administrative space** in various buildings. University projects in the planning and construction stages include a biomedical research and biotechnology center near Palermo, Italy, which is being funded, in part, by the Italian government and jointly overseen by UPMC and the School of Medicine. A major addition has recently been completed to Salk Hall, which houses the School of Dental Medicine and the School of Pharmacy; extensive, multiphase renovations are nearing completion at the Graduate School of Public Health and are under way at the School of Medicine. A recent renovation at the School of Nursing transformed three simulation labs, an 18-bed skills lab, a telehealth lab, and student study areas; this new space in the Victoria Building also includes a multipurpose learning center and a recording studio.

RESEARCH INFRASTRUCTURE

In 2016, the National Institutes of Health chose the University of Pittsburgh Clinical and Translational Science Institute (CTSI) to help build the foundational partnerships and infrastructure needed to launch NIH's All of Us Research Program, which aims to engage 1 million or more research participants to revolutionize how disease is prevented and treated based on individual differences in lifestyle, environment, and genetics. Pitt was awarded \$4.2 million the first year, with a potential of up to **\$46 million over five years**. Pitt's project, called All of Us Pennsylvania, began enrolling the first of an anticipated 150,000 patients in the region in mid-2017 and plans to fund pilot studies using accrued data to advance precision medicine.

CTSI was among the first 12 recipients of NIH's Clinical and Translational Science Awards (CTSA) in 2006. Since then, Pitt's CTSA funding has totaled more than **\$221 million**. Over the past decade, CTSI has built an infrastructure of programming to support all avenues of scientific investigation, from guidance in regulatory requirements and study design to career/workforce development, education and training, community engagement, biomedical informatics, pilot funding of early-stage research, innovation, and entrepreneurship.

INTERPROFESSIONAL TEAM-BASED CARE

At the University of Pittsburgh, students pursuing careers in the health sciences are immersed in a culture that values interprofessional team-based care. Interprofessionalism is becoming the standard of practice in all health care settings, as recommended by the National Academies of Science, Engineering, and Medicine; World Health Organization; and many of our most respected professional societies. Interprofessional practice and education are now included in accreditation standards for schools of nursing, dental medicine, public health, pharmacy, and osteopathic medicine, as well as those that offer programs in physical and occupational therapy. At Pitt, we not only embrace this concept, we aspire to be a national model for its implementation.



OUR CLINICAL PARTNER: UPMC

Through its affiliation with UPMC (University of Pittsburgh Medical Center), the University of Pittsburgh offers extraordinary opportunities for students, faculty members, medical residents, and postdoctoral researchers from all of the Schools of the Health Sciences. These opportunities include clinical rotations, internships, hands-on research experience, and access to a substantial patient population for conducting biomedical and clinical research. Although legally separate and distinct entities, the Schools of the Health Sciences and UPMC share an explicit interdependence and a common commitment to excellence in education, research, clinical care, and entrepreneurship.

As an integrated global health enterprise and one of the nation's leading academic health care systems, with **\$14 billion in revenues**, UPMC has more than **5,700 affiliated physicians**, of whom 1,384 are also full-time faculty of the School of Medicine; more than 25 tertiary care, specialty, and community hospitals serving 29 counties throughout Pennsylvania; as well as specialized outpatient facilities, cancer centers, rehabilitation facilities, retirement and long-term care facilities, imaging services, doctors' offices, and a health insurance plan covering more than 3 million members. UPMC most recently has expanded its reach to include hospitals in Eastern Pennsylvania and New York.

As of August 1, 2017, the UPMC Medical Education Program has 1,132 medical residents and 370 clinical fellows in programs approved by the Accreditation Council for Graduate Medical Education, plus seven clinical fellows in other programs.

UPMC's clinical programs have earned international recognition, drawing patients from around the world. In addition, the medical center is now transporting its expertise to other countries, including Italy (where it manages the Mediterranean Institute for Transplantation and Advanced Specialized Therapies in Palermo) and Ireland, as well as ventures in China, Kazakhstan, and others.



BERNARD J. COSTELLO, DMD, MD, serves as dean and professor of oral and maxillofacial surgery at the University of Pittsburgh School of Dental Medicine. Dr. Costello is chief of pediatric oral and maxillofacial surgery in the Division of Pediatric Dentistry at Children's Hospital of Pittsburgh of UPMC. He is codirector of the dentofacial interdisciplinary team and fellowship director of the Pediatric Craniomaxillofacial Surgery Program at the School of Dental Medicine.

Dr. Costello earned dental and medical doctorates from the University of Pennsylvania, where he also completed a residency in oral and maxillofacial surgery, followed by a craniofacial fellowship at the Posnick Center for Facial Plastic Surgery in Chevy Chase, Md., and Georgetown University Medical Center.

Dr. Costello serves on the American Board of Oral and Maxillofacial Surgery, as vice president of the American Cleft-Palate Craniofacial Association, and as past-president of the American Academy of Craniomaxillofacial Surgeons. He is a fellow of the American College of Surgeons and the American College of Dentists.

Dr. Costello has been principal and co-investigator on a number of grants and research contracts, including "Novel Synthetic Bone Craniofacial Regeneration," funded by the U.S. Department of Defense, and "Bone Tissue Engineering Using Natural Materials," funded by the Pennsylvania Department of Health and the National Science Foundation. He has also been an investigator for studies evaluating tissue adhesives and craniosynostosis, a premature fusing of infant skull bones. He is an author on numerous peer-reviewed publications as well as an editor and contributor to many texts focused on pediatric craniomaxillofacial surgery.

School of Dental Medicine

OVERVIEW

Established in 1896 as the Pittsburgh Dental College, the School of Dental Medicine was incorporated into the University of Pittsburgh in 1905. The school offers a four-year predoctoral program leading to a doctor of dental medicine (DMD) degree, an international advanced standing program for graduates of dental schools outside the United States, and postgraduate advanced education and residency programs in 10 disciplines. There are nine residency programs and an Oral Biology program, which confers MS and PhD degrees. Additionally, the school offers the only dental hygiene certificate program in Pennsylvania affiliated with a major university, as well as a dental hygiene baccalaureate degree program. The School of Dental Medicine's comprehensive clinical offerings include the **Multidisciplinary Implant Center** and the **Center for Patients with Special Needs**, one of the few U.S. centers dedicated to training future dentists to care for patients with disabilities.

Research efforts include dental and craniofacial genetics, dental public health, craniofacial anomalies, caries, periodontal disease, pharmacology, pain control, tissue engineering, craniofacial regeneration, educational research, informatics, and implantology.

Fiscal year 2017 saw dental faculty generate more than **\$8.8 million in research funding**, the majority of which came from the National Institute of Dental and Craniofacial Research (NIDCR) of the National Institutes of Health, ranking the school fourth among American schools of dentistry.

RESEARCH STRENGTHS

Genetic Studies

The School of Dental Medicine is undertaking investigations to identify genes that contribute to complex human phenotypes, primarily those involved in dental and craniofacial disorders, including behavioral and epidemiological factors. New territory is being charted to develop the first-known collection of DNA samples paired with anonymized dental records to support genetics research.

Craniofacial Repair

Tissue engineering-based approaches are being developed to treat complex multistructural wounds and defects of the face and skull in a way that restores function and appearance. The school is at the forefront of research to develop relevant translational treatment solutions usable by practicing dentists.

Oral Health

The School of Dental Medicine is identifying factors that lead to oral health disparities in children and families in Appalachia. Oral public health research leads to improved interventions, understanding, and advancements for the future of oral health education and treatment.

DEMOGRAPHICS

For the 2017–18 academic year, the School of Dental Medicine accepted 80 incoming first professional degree or doctor of dental medicine students from a pool of 1,955 applicants. Fifty-four percent of the students enrolled in the doctoral program are women. There are 61 students in the dental hygiene certificate program and 27 in the bachelor of science in dental hygiene program. The School of Dental Medicine has 97 full-time, 104 part-time, 122 adjunct, and 16 emeritus faculty members.

DEPARTMENTS

Dental Anesthesiology

Joseph A. Giovannitti Jr., DMD, Chair

Dental Public Health

Robert J. Weyant, DMD, DrPH, Chair

Diagnostic Sciences

L. G. Schneider, DDS, Chair

Endodontics

Herbert Ray, DMD, Chair

Oral and Maxillofacial Surgery

Mark W. Ochs, DMD, MD, Chair

Oral Biology

Mark P. Mooney, PhD, Chair

Orthodontics and Dentofacial Orthopedics

Joseph F. A. Petrone, DDS, MSD, MPH, Chair

Pediatric Dentistry

Adriana M. Vieira, DDS, DMD, PhD, Chair

Periodontics/Preventive Dentistry

Charles Sfeir, DMD, DDS, PhD, Chair

Prosthodontics

Thomas Kunkel, DMD, Chair

Restorative Dentistry and Comprehensive Care

Michael A. Dobos, DMD, Chair

DEGREE PROGRAMS

Along with several specialized degree programs, degrees offered at the School of Dental Medicine include the doctor of dental medicine (DMD), doctor of philosophy (PhD), master of science (MS), master of public health (MPH, offered in conjunction with the Graduate School of Public Health), and bachelor of science (BS).

The four-year **doctor of dental medicine** (DMD) program prepares students to provide comprehensive care to a diverse patient population. The competency-based curriculum emphasizes health promotion and disease prevention and prepares students to provide individualized treatments using the best available scientific evidence. Graduates are equipped to practice as independent, entry-level general practitioners.

The **Advanced Standing DMD Program** places qualified graduates of dental schools outside the United States as third-year dental students. These students integrate into the program and complete the third and fourth years of the first professional curriculum with other class members.

The **PhD/MS in oral biology** encompasses the study of fundamental biological phenomena related to the development, structure, and function of the craniofacial region as well as the development of new therapies, biomaterials, and diagnostic tools for the treatment of disorders and diseases of the craniofacial area, with the aim of improving health. Current research focuses on craniofacial regeneration and genetics.

In collaboration with the Graduate School of Public Health, the four-year **DMD/MPH in dental public health** offers a customizable course selection, with a special emphasis on oral health-specific public health issues.

The **Dental Hygiene Program** provides students a unique academic environment where they can earn either an **associate of science** or a **bachelor's degree in dental hygiene**. Interprofessional educational experiences within the school's specialty dental clinics and nearby University-affiliated hospitals, in conjunction with didactic, community outreach, and research activities, afford multiple opportunities for students to obtain a high-quality education.

RESIDENCY PROGRAMS

Dental Anesthesiology

Endodontics

General Practice

Oral and Maxillofacial Pathology

Oral and Maxillofacial Surgery

Orthodontics and Dentofacial Orthopedics

Pediatric Dentistry

Periodontics

Prosthodontics

GENERAL DENTISTRY AND SPECIALTY CLINICS

The School of Dental Medicine provides clinical education and patient care through 15 dental clinics encompassing general dentistry, anesthesiology, special needs, emergency, implants, oral and maxillofacial pathology, oral and maxillofacial surgery, orthodontics and dentofacial orthopedics, pediatric dentistry, periodontics and preventive dentistry, dental hygiene, endodontics, prosthodontics, radiology, and restorative dentistry/comprehensive care.

CLINICAL CENTERS

The **Multidisciplinary Implant Center** focuses on patient care, teaching, and research related to the treatment of tooth loss and the functional bone and soft tissue deficits that can follow tooth loss.

The **Center for Patients with Special Needs** was established by former dean Thomas W. Braun as a school priority to centralize and increase treatment capacity for patients with physical, developmental, neurological, and intellectual disabilities.

University Dental Health Services (UDHS) is a legally separate nonprofit practice plan that is closely affiliated with the School of Dental Medicine. UDHS providers are full- or part-time faculty members, many of whom are board-certified specialists and nationally recognized experts in their respective fields.

RESEARCH CENTERS

Center for Craniofacial and Dental Genetics

Center for Craniofacial Regeneration

Center for Informatics in Oral Health Translational Research

Center for Oral Health Research in Appalachia

Dental Registry and DNA Repository





ANTHONY DELITTO, PHD, PT, joined the School of Health and Rehabilitation Sciences (SHRS) in 1992 as assistant professor in the Department of Physical Therapy and became department chair in 1994. Dr. Delitto expanded the department's intensive doctor of physical therapy (DPT) degree program, as well as its patient-centered, outcomes-based research efforts. He was named SHRS dean in 2016.

Dr. Delitto's research has focused on nonpharmacological management of painful musculoskeletal conditions, particularly low back pain. He helped pioneer a treatment-based classification system for low back pain management and currently studies the translation of classification and treatment-effectiveness studies into quality-improvement initiatives.

In 2015, Dr. Delitto was awarded a \$13 million grant by the Patient-Centered Outcomes Research Institute to conduct a trial aimed at reducing the transition from acute to chronic low back pain.

A member of the American Physical Therapy Association, Dr. Delitto received the Catherine Worthingham Fellowship, the association's highest honor, in 2000. In 2007, he delivered the Mary McMillan Lecture in recognition of distinguished contributions in the areas of education, patient care, and research.

Dr. Delitto earned his bachelor's degree in physical therapy from the State University of New York at Buffalo. He completed a master of health science in physical therapy and PhD in social psychology at Washington University in St. Louis.

School of Health and Rehabilitation Sciences

OVERVIEW

The University of Pittsburgh School of Health and Rehabilitation Sciences (SHRS) is recognized as a global leader in rehabilitation and disabilities studies. Its research, education, and training efforts focus on supporting children, adults, active members of the armed services, veterans, and seniors with disabilities, limited functionality, or other needs of rehabilitation and therapy.

Grant funds of nearly \$21.3 million were awarded to SHRS faculty in fiscal year 2017. The school is recognized as among the **top 5 percent of schools** in the United States to study health professions as determined by College Factual (www.collegefactual.com).

U.S. News and World Report has recognized SHRS graduate programs in physical therapy (first), occupational therapy (fourth), speech-language pathology (seventh), audiology (seventh), and rehabilitation counseling (18th) as **among the top 10 percent of programs in the U.S.**; they are also the highest-ranked programs among Pennsylvania higher education institutions.

Graduates of SHRS programs have been highly successful in taking licensure and certification examinations. Their success rates have been among the highest for institutions in the U.S., with some programs consistently at or near 100 percent.

School of
Dental Medicine

School of Health
and Rehabilitation
Sciences

School of Medicine

School of Nursing

School of Pharmacy

Graduate School
of Public Health

RESEARCH STRENGTHS

Physical Therapy Research

As people age, a key component of maintaining an independent lifestyle is the ability to walk. Faculty members from the Department of Physical Therapy are investigating ways to help people stay independent longer. These studies are among the first in the nation to be funded by grants from the Patient-Centered Outcomes Research Institute.

Injury Prevention and Performance Optimization

The Department of Sports Medicine and Nutrition's researchers and clinicians focus on optimizing human performance and mitigating musculoskeletal injuries to improve quality of life and resiliency in athletic, military, and active populations. Individuals are evaluated using sports-simulated environments to determine specific variables, including the influence of weight distribution, muscle function, balance, flexibility, proprioception, gender, aging, and fatigue, as well as the effects of injury, surgery, and rehabilitation on joint stability.

Assistive Technology Development

Long the leader in assistive technology research, SHRS continues to pioneer new technologies and enhance existing devices in its aim to improve quality of life for people with disabilities. Expertise runs the gamut from wheeled mobility and seating rehabilitation to robotics, other intelligent systems, and tissue integrity management.

DEMOGRAPHICS

For 2017–18, the School of Health and Rehabilitation Sciences had 123 full-time faculty and 392 part-time and adjunct faculty. SHRS received 2,651 applications for 2017–18 admission. There are 1,342 students enrolled, 61 percent of whom are Pennsylvania residents. Approximately 12 percent of SHRS students are from groups that are underrepresented within the health and rehabilitation sciences professions.

SHRS has a total of 787 graduate students, 65 of whom are enrolled in PhD programs. There are 555 undergraduate students and 65 students enrolled in certificate programs.

DEPARTMENTS

Communication Science and Disorders

Cheryl Messick, PhD, Interim Chair

Emergency Medicine

Walt Stoy, PhD, Program Director

Health Information Management

Mervat Abdelhak, PhD, Chair

Occupational Therapy

Elizabeth Skidmore, PhD, Chair

Physical Therapy

James Irrgang, PhD, Chair

Physician Assistant Studies

Deborah Opacic, EdD,
Program Director

Rehabilitation Science and Technology

Rory Cooper, PhD, Chair

Sports Medicine and Nutrition

Kevin Conley, PhD, Chair

DEGREE PROGRAMS

Degrees offered through the School of Health and Rehabilitation Sciences include the doctor of philosophy (PhD), doctor of audiology (AuD), doctor of clinical science in medical speech-language pathology (CScD), doctor of clinical science in occupational therapy (CScD), doctor of occupational therapy (OTD), doctor of physical therapy (DPT), master of occupational therapy (MOT), master of arts or science (MA/MS), and bachelor of arts or science (BA/BS).

The **Communication Science and Disorders** research doctoral program emphasizes scientific inquiry as well as basic and applied research training. Students may conduct a program of independent and scholarly research.

The **Rehabilitation Science** doctoral program advances rehabilitation practice through research, teaching, and professional development. Students enter the interdisciplinary program through SHRS departments/programs in **Health Information Management, Occupational Therapy, Physical Therapy, Rehabilitation Counseling, Rehabilitation Science and Technology, and Sports Medicine**.

Graduates will have an area of expertise in rehabilitation science as well as a core of interdisciplinary knowledge related to this specific area. They will become the researchers, scholars, teachers, thinkers, and planners in the demanding and changing field of rehabilitation science.

The **doctor of audiology** is the required entry-level degree for professional audiologists. The SHRS AuD curriculum exceeds American Speech-Language-Hearing Association/American Academy of Audiology standards and prepares audiologists for private practice, professional leadership, and clinical faculty positions in academic centers.

The **doctor of clinical science in medical speech-language pathology** is an advanced program recommended for the student or practicing speech language pathologist seeking to learn state-of-the-science information and clinical skills. The program is designed for professionals working with medically fragile patients (and their families) across the lifespan in a range of settings.

The **doctor of clinical science in occupational therapy** is an advanced practice doctoral program for occupational therapists. The program focuses on clinical specialization, clinical education, and professional leadership by providing coursework, discussion-based colloquia, and hands-on practical experiences addressing the most current theories and evidence, as well as up-to-date assessment and intervention methods in occupational therapy practice.

The **doctor of physical therapy** is a three-year, full-time professional program that integrates science and clinical practice, emphasizes evidence-based practice, and includes a comprehensive array of courses in musculoskeletal, neuromuscular, integumentary, cardiopulmonary, geriatric, and pediatric physical therapy. Clinical settings include acute care, pediatrics, geriatrics, short- and long-term rehabilitation, sports medicine, and orthopaedics, as well as opportunities related to women's health, neurorehabilitation, industrial rehabilitation, spine care, and balance and vestibular disorders.

The **doctor of occupational therapy** is a three-year professional course of study. Occupational therapists (OTs) evaluate individuals' abilities to perform the necessary or desired tasks of everyday life. OTs work in hospitals, rehabilitation centers, nursing facilities, schools, private homes, and other work sites. They also share effective therapeutic strategies with families and caregivers. The curriculum includes course objectives and learning activities that prepare students beyond the generalist level of an occupational therapist in practice skills, research skills, administration, professional development, leadership, advocacy, and theory.

The **Communication Science and Disorders Program** (MA/MS) offers specializations in speech-language pathology and audiology. **Speech language pathologists** pursue the prevention, diagnosis, treatment, and rehabilitation of a wide range of expressive communication and swallowing disorders. **Audiologists** concentrate on receptive communication disorders, especially the prevention, identification, and measurement of hearing loss and the rehabilitation of individuals with hearing impairments, as well as the assessment of balance disorders. The curriculum offered for each track exceeds American Speech-Language-Hearing Association standards.

The **coordinated master in nutrition and dietetics** curriculum prepares students for careers as registered dietitians/nutritionists and involves a minimum 1,200-hour accredited supervised practice experience and successful performance on the national registration examination for dietitians. The Department of Sports Medicine and Nutrition offers a program designed to meet education and experiential requirements at the master's level.

The **Physician Assistant Studies Program** (MS) prepares students for careers as health care professionals licensed to practice medicine with physician supervision. Physician assistants practice primary and specialty patient care in medical and surgical settings.

Students who successfully complete the **prosthetics and orthotics** program (MS) learn about the evaluation, fabrication, and custom fitting of artificial limbs and orthopaedic braces. The curriculum meets National Commission on Orthotic and Prosthetic Education accreditation standards and includes clinical internships.

For students considering a career in speech-language pathology or audiology, an undergraduate major in **communication science** (BA) provides an appropriate scientific foundation for subsequent graduate study. This degree emphasizes the normal processes of speech, language, and hearing and also provides an introduction to the nature, cause, and remediation of communication disorders across the lifespan.

Pitt's **athletic training** (BS) program of academic study and clinical training equips students for careers at all levels of sports medicine—from general to secondary education, collegiate, and professional sports. Instruction includes the prevention, recognition, treatment, and rehabilitation of injuries incurred by athletes and the physically active. In the field, athletic trainers administer emergency care and (under the supervision of a licensed physician) help develop a treatment plan based on medical, exercise, and sports sciences.



The **Nutrition and Dietetics Program** (BS) applies the science of food and nutrition to the health and well-being of individuals and groups. The curriculum meets Accreditation Council for Education in Nutrition and Dietetics standards. Students completing the didactic program in dietetics are eligible for placement in an accredited supervised practice program.

Full-time students can complete Pitt's **health information management** program (BS)—one of approximately 50 nationwide—in four terms and one summer session. The program prepares students to sit for the Registered Health Information Administrator exam that qualifies students as health information management experts. Undergraduates also participate in four different clinical education internships that facilitate a deeper understanding of the professional practice aspects of health information and related health-care areas.

The undergraduate program in **rehabilitation science** (BS) uniquely prepares students for graduate education in occupational therapy, physical therapy, rehabilitation counseling, rehabilitation technology, wellness and human performance, physician's assistant studies, prosthetics and orthotics, and other specialties.

Students who undertake the **Program in Emergency Medicine** (BS) receive a strong clinical and educational foundation for the advanced skills needed in emergency medical services or any health care profession. At the end of the junior year, students are eligible to sit for the National Certification Examination for Paramedics, administered by the National Registry of Emergency Medical Technicians.

RESEARCH CENTERS

Center of Excellence for Injury Prevention and Performance Enhancement
Human Engineering Research Laboratories
Model Center on Spinal Cord Injury
Neuromuscular Research Laboratory



ARTHUR S. LEVINE, MD, is senior vice chancellor for the health sciences and John and Gertrude Petersen Dean of the School of Medicine at the University of Pittsburgh. Since arriving at Pitt in 1998, Dr. Levine has been instrumental in fostering the University's remarkable rise in research ranking and many advances in medical education.

Previously, Dr. Levine served at the National Institutes of Health for more than three decades, having joined the National Cancer Institute in 1967. From 1982 to 1998, he was scientific director of the National Institute of Child Health and Human Development, widely recognized as one of the world's leading centers in developmental biology.

Earlier in his career, Dr. Levine played a leading role in clinical research on childhood malignancies, and he was one of the first to carry out systematic investigations on the prevention and treatment of opportunistic infections among cancer patients. His current research efforts focus on the molecular mechanisms of DNA damage and repair.

Dr. Levine, who has authored or coauthored more than 270 scientific publications, has been widely recognized for his achievements. He received the Meritorious Service and the Distinguished Service Medals of the United States Public Health Service, the Surgeon General's Exemplary Service Medal, the NIH Director's Award, and the Distinguished Alumnus Award and an Honorary Doctor of Humane Letters degree from the Rosalind Franklin University of Medicine and Science, formerly the Chicago Medical School.

Dr. Levine is a graduate of Columbia College, where he majored in comparative literature. He earned his MD from the Rosalind Franklin University of Medicine and Science. Prior to joining the NIH, he completed a pediatrics residency and a fellowship in hematology and biochemical genetics at the University of Minnesota.

School of Medicine

OVERVIEW

The University of Pittsburgh School of Medicine has a mission to educate science-based, skilled, and compassionate clinicians prepared to meet the challenges of practicing medicine in the 21st century and to conduct cutting-edge biomedical research that better the human condition and advances the fundamental understanding of medical science.

In the only truly objective metric by which the overall stature of research-focused institutions can be assessed in a nationally competitive context, the University of Pittsburgh moved into the top 10 list of recipients of National Institutes of Health (NIH) funding in 1998 and has remained within this enviable echelon ever since. In an analysis of NIH funding for federal fiscal year 2017, the faculty of the University of Pittsburgh **ranked fifth** in total grants awarded, with more than **\$528 million in funding**—approximately 92 percent of which (\$485 million) went to the School of Medicine.

The School of Medicine operates on a global stage, with active collaborations connecting Pittsburgh with China, France, Ghana, Honduras, India, Italy, Kazakhstan, Malawi, the Philippines, Vietnam, and many other nations.

RESEARCH STRENGTHS

Within the School of Medicine, areas of research concentration include the biology of aging; neuroscience; vision and vision restoration; comparative effectiveness research; genome stability and tumorigenesis; regenerative medicine and biomedical device development; vascular, developmental, structural, and computational and systems biology; immunology, including immunological approaches to cancer; cancer virology; and clinical research/clinical trials, among others.

School of
Dental Medicine

School of Health
and Rehabilitation
Sciences

School of Medicine

School of Nursing

School of Pharmacy

Graduate School
of Public Health

Imaging

Imaging technologies are important tools for Pitt faculty investigating all facets of biology. The University's **Center for Biologic Imaging** is the largest optical imaging facility in the country. The center provides a truly cutting-edge environment, including electron, super-resolution, live-cell, and high-speed confocal microscopes. These tools enable the visualization of life ranging from the individual molecule to the whole body. Recent advances in high-speed confocal imaging made at Pitt enable the collection of truly massive three-dimensional data sets that push the limits of data collection and visualization. One exciting advance in visualization is that these data can be explored through virtual reality. For example, researchers can wander the brain at a cellular level, meander through blood vessels, track a virus as it invades the brain, and observe the structural complexities of a pig's eye. The technology gives scientific data sets an undeniable "wow factor." More importantly, it provides a striking visual perspective that can lead to new observations and new questions.

Immunotherapy

The University of Pittsburgh and UPMC are partners in efforts to harness the body's natural defenses and improve treatment outcomes through immunotherapy. The **UPMC Immune Transplant and Therapy Center (ITTC)**, announced in early 2018, is an integral part of this collaboration. With a \$200 million investment by UPMC, the University will create a world-class space for labs, offices, startup companies, and industry partners. The property, adjacent to **UPMC Hillman Cancer Center** and UPMC Shadyside, represents Pitt's largest development project to date aimed at strengthening the city's innovation district. Building on Pitt and UPMC's longstanding record of success in patient care and research, ITTC investigators will seek ways to fine-tune the immune system to fight cancer cells, explore immune transplantation in conjunction with solid organ transplantation to reduce rejection and reliance on immunosuppressive medicines, and examine how immunotherapy can combat conditions like cardiovascular disease, obesity, and sickle cell anemia.

Neuroscience

In addition to imaging tools, Pitt faculty use clinical and basic science expertise to unlock the mysteries of normal and abnormal brain function. Concentrated primarily in the Departments of Neurobiology, Neurology, Neurological Surgery, Ophthalmology, and Psychiatry in the School of Medicine and the Departments of Neuroscience and Psychology in the Dietrich School of Arts and Sciences, these investigators are working to develop novel treatments and cures for brain disorders, including neurodegenerative diseases, spinal cord injuries, tumors, and psychiatric illnesses. Since 2014, their efforts have received additional support through the creation of a University-wide **Brain Institute**.

Precision Medicine and Big Data

The programmatic focus of the **Institute for Precision Medicine** is to apply new knowledge in genetics, genomics, and other disciplines toward the advancement of evidence-based medicine, with the goal of improving disease prevention and treatment models. Current goals focus on research and clinical implementation of pharmacogenomics and development of computational infrastructure for analysis and sharing of large-scale phenotype (clinical) and genotype data. The School of Medicine has recently received federal and state grants, including \$4.2 million to build the foundational relationships and the infrastructure needed to launch the National Institutes of Health-funded All of Us Program, a landmark longitudinal research effort that aims to engage 1 million or more U.S. participants to revolutionize how disease is prevented and treated based on individual differences in lifestyle, environment, and genetics. Another project is being conducted in collaboration with the Pittsburgh Supercomputing Center and Carnegie Mellon University to handle and analyze biomedical Big Data.

DEMOGRAPHICS

As of the 2017–18 academic year, 591 MD students are registered in the School of Medicine, including 300 (51 percent) women and 291 (49 percent) men. Of these, 186 (31 percent) are Pennsylvania residents; approximately 16 percent of Pitt medical students are from groups that are underrepresented within the medical profession.

There are 273 registrants in PhD programs (including those in the Medical Scientist Training Program), 87 students in MS programs, and 27 students in certificate programs.

For 2017, 6,151 applications for admission were received, and 796 prospective students were interviewed for a first-year class of 148 students.

The School of Medicine has 2,264 regular and 2,213 volunteer faculty members. Of these, 81 are current members of the Academy of Master Educators, an organization that recognizes and rewards excellence in medical education.

CURRICULUM HIGHLIGHTS

All medical students engage in a **scholarly research project** that has been incorporated longitudinally throughout the curriculum. A wide range of opportunities includes traditional laboratory-based or clinical research experiences, as well as alternatives, such as health policy, epidemiology, and comparative effectiveness research, that appeal to individual students' interests and long-term career aspirations. Projects aim to illustrate the mechanics of scientific investigation; teach students how to develop a hypothesis and how to collect, analyze, and interpret data to test it; encourage them to pursue research opportunities; and help them understand the fundamental thought processes that lead to success in clinical medicine.

DEPARTMENTS

Anesthesiology

Marshall W. Webster, MD,
Interim Chair

Biomedical Informatics

Michael J. Becich, MD, PhD, Chair

Cardiothoracic Surgery

James D. Luketich, MD, Chair

Cell Biology

Alexander D. Sorkin, PhD, Chair

Computational and Systems Biology

Ivet Bahar, PhD, Chair

Critical Care Medicine

Derek C. Angus, MD, MPH, Chair

Dermatology

Louis D. Faló, MD, PhD, Chair

Developmental Biology

Cecilia Lo, PhD, Chair

Emergency Medicine

Donald M. Yealy, MD, Chair

Family Medicine

Jeannette E. South-Paul, MD, Chair

Immunology

Mark J. Shlomchik, MD, PhD, Chair

Medicine

Mark T. Gladwin, MD, Chair

Microbiology and Molecular Genetics

Thomas E. Smithgall, PhD, Chair

Neurobiology

Peter L. Strick, PhD, Chair

Neurological Surgery

Robert M. Friedlander, MD, Chair

Neurology

Lawrence R. Wechsler, MD, Chair

Obstetrics, Gynecology, and Reproductive Sciences

Robert P. Edwards, MD, Chair

Ophthalmology

José-Alain Sahel, MD, Chair

Orthopaedic Surgery

Freddie H. Fu, MD, DSci (Hon.), Chair

Otolaryngology

Jonas T. Johnson, MD, Chair

Pathology

George K. Michalopoulos, MD,
PhD, Chair

Pediatrics

Terence S. Dermody, MD, Chair

Pharmacology and Chemical Biology

Bruce A. Freeman, PhD, Chair

Physical Medicine and Rehabilitation

Gwendolyn A. Sowa, MD, PhD, Chair

Plastic Surgery

J. Peter Rubin, MD, Chair

Psychiatry

David A. Lewis, MD, Chair

Radiation Oncology

Joel S. Greenberger, MD, Chair

Radiology

Jules H. Sumkin, DO, Chair

Structural Biology

Angela Gronenborn, PhD, Chair

Surgery

Timothy R. Billiar, MD, Chair

Urology

Joel B. Nelson, MD, Chair

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Simulation training allows medical students to engage in comprehensive learning activities using whole-body simulators; most students seek additional elective time with these sophisticated training tools, which help them to develop resuscitation, defibrillation, auscultation, airway management, and other clinical skills.

The fourth-year **integrated life science program** includes courses that revisit some aspect of basic science. The level of sophistication that students have developed by this stage in their medical education promotes a deeper understanding of the relevance of basic science to clinical problems.

Evidence-Based Medicine—an ongoing focus of the curriculum—teaches students how to critically evaluate the medical literature and to use medical databases to make patient care decisions based on best practices.

Students experience a variety of **teaching methods** at Pitt. During the first two years, students spend only about one-third of their time in lectures and team-based learning sessions. Another third is spent in small-group sessions; the remainder includes self-directed learning, computer-based study, community visits, clinical experiences, and other activities.

OPPORTUNITIES FOR IN-DEPTH STUDY

Optional **areas of concentration** enable students to cultivate their enthusiasm for a particular aspect of medicine through hands-on experiences, faculty mentoring, research projects, and other activities throughout all four years. Topics include disabilities medicine, medical humanities, geriatric medicine, women's health, health care to underserved populations, neuroscience, global health, integrative health, resuscitation medicine, public health, and patient safety and quality improvement.

The **Medical Scientist Training Program** (MSTP) provides an opportunity for medical students interested in a biomedical research career to undertake doctoral work at either the University of Pittsburgh or Carnegie Mellon University in basic science, engineering, or public health. After two years of medical school, students complete PhD work before returning to medical training. Both degrees are completed in an average of seven to eight years. The program, funded by a grant from NIH with support from the Office of the Dean, offers full tuition and a yearly stipend.

The **Clinical Scientist Training Program** (CSTP) gives medical students interested in clinical research careers an opportunity to delve more deeply into their scholarly projects during a fifth year of training. Students apply to the CSTP in January of the year they plan to commit to full-time research (typically between the third and fourth years of medical school). Selected students are appointed as research fellows and receive a living stipend, travel funds, health insurance, and tuition toward a graduate certificate in clinical research. After successful completion of the fellowship year, they receive a CSTP scholarship toward the final year of medical school.

The **Physician Scientist Training Program (PSTP)** is a five-year program for exceptionally talented students who, in addition to the regular curriculum, dedicate a year and two summers to laboratory-based research training and enrichment courses that prepare them for careers in academic medicine. PSTP students receive partial tuition assistance for the four years of medical school plus a stipend during the two research summers and the research year.

DEGREE PROGRAMS

Degrees offered at the School of Medicine include the doctor of medicine (MD), doctor of philosophy (PhD), master of science (MS), and several specialized certificates.

The **Interdisciplinary Biomedical Graduate Program (PhD)** combines a core curriculum with research and a dissertation focused on a choice of cell biology and molecular physiology, cellular and molecular pathology, molecular genetics and developmental biology, or molecular pharmacology.

Laboratory research in theory and practice is a major focus of the cross-campus **Center for Neuroscience Graduate Training Program (PhD)**, which aims to develop general competence in neuroscience, as well as expertise in one or more areas of specialization.

The **Biomedical Informatics Training Program (PhD, MS, or certificate)** applies modern information technology to health care, education, and biomedical research. Courses provide graduate students with a broad knowledge of the field and superb training in research methods.

Offered by the University of Pittsburgh and Carnegie Mellon University, the **Joint Program in Computational Biology (PhD)** is designed to develop expertise in the use of computational methods to identify and solve complex biological problems.

The interdisciplinary **Molecular Biophysics and Structural Biology Graduate Program (PhD)** trains students in a broad range of cutting-edge technologies used to study the function of biological macromolecules in physical terms and covers a diversity of research topics in molecular biophysics and structural biology.

The goal of the **Integrative Systems Biology Program (PhD)** is to train students in emerging transformative methodologies that emphasize genomics, proteomics, complex cellular pathways, and the dynamics of cellular and organismal function. Students in this program operate at the exciting interface between basic benchtop biology, computational analysis of big data sets, and the emergence of 21st century clinical translation.

The **Program in Microbiology and Immunology (PhD)** aims to train highly motivated graduate students as self-reliant scholars in an environment with ready access to the breadth of expertise, approaches, and sub-disciplines that constitute the diverse fields of microbiology and immunology.

The **Biomedical Master's Program (MS)** is designed for students who desire additional training, mentoring, and advising to strengthen their academic and professional credentials for admission to health professional schools or for entry to the biomedical workforce.

Among offerings from Pitt's **Institute for Clinical Research Education (ICRE)** are programs in **Clinical and Translational Science** (PhD), **Clinical Research** (MS or certificate), **Medical Education** (MS or certificate), and **Comparative Effectiveness Research** (certificate).

INSTITUTES AND CENTERS

- Aging Institute**
- Brain Institute**
- Center for Military Medicine Research**
- Center for Vaccine Research**
- Clinical and Translational Science Institute**
- Drug Discovery Institute**
- Institute for Clinical Research Education**
- Institute for Precision Medicine**
- Magee-Womens Research Institute**
- McGowan Institute for Regenerative Medicine**
- Pittsburgh Institute for Neurodegenerative Diseases**
- Thomas E. Starzl Transplantation Institute**
- UPMC Hillman Cancer Center**
- Vascular Medicine Institute**





JACQUELINE DUNBAR-JACOB, PHD, RN, is Distinguished Service Professor of Nursing and professor of psychology, of epidemiology, and of occupational therapy.

Dr. Dunbar-Jacob received her BS in nursing from Florida State University, her MS in psychiatric nursing from the University of California, San Francisco, and her PhD in counseling psychology from Stanford University. She joined the University of Pittsburgh faculty in 1984 and was named dean in 2001.

Among Dr. Dunbar-Jacob's many honors are the University of Pittsburgh Chancellor's Distinguished Research Award; the Pennsylvania Nightingale Award for Research; the Pathfinders Award for Research, conferred by the Friends of the National Institute of Nursing Research (NINR); and induction into the Sigma Theta Tau International Nurse Researcher Hall of Fame. In 2015, Mometrix named her one of the 30 most influential nursing deans in the United States.

In 2013, the University awarded Dr. Dunbar-Jacob the title of Distinguished Service Professor to acknowledge her distinctive contributions in support of the institution's teaching, research, and service missions.

Dr. Dunbar-Jacob is an alumna of the Robert Wood Johnson Executive Nurse Fellows program and a past president of the Society of Behavioral Medicine, the Academy of Behavioral Medicine Research, and the Friends of the NINR.

She is a fellow of the prestigious American Academy of Nursing, as well as the American Psychological Association, the American Heart Association, the Society of Behavioral Medicine, and the Academy of Behavioral Medicine Research.

School of Nursing

OVERVIEW

Since 1939, the School of Nursing has prepared students for increasingly demanding practice and academic environments through degree programs that incorporate rigorous theoretical and practical course work with progressively complex clinical experiences.

The School of Nursing received more than **\$7.3 million** from the National Institutes of Health (NIH) in 2017, ranking it **sixth** in the amount of research funding received from the NIH. The school's faculty has received funding from a broad range of agencies, including the National Cancer Institute; National Heart, Lung, and Blood Institute; National Institute of Diabetes and Digestive and Kidney Diseases; National Institute of Neurological Disorders and Stroke; and the National Institute of Nursing Research, among others.

The school has consistently been among the top graduate schools of nursing. Highly ranked areas of concentration in *U.S. News & World Report's* 2017 rankings include anesthesia (fourth), pediatric nurse practitioner (ninth), nursing informatics (ninth), adult nurse practitioner (fifth), psychiatric/mental health clinical nurse specialist (10th), and nursing service administration (eighth). In 2016, the school was ranked 12th in the *QS World University Rankings by Subject*, based on academic reputation, employer evaluation, and research impact.

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RESEARCH STRENGTHS

eHealth Research

Technological innovations, including mobile sensors, wireless transmission of clinical data, and sophisticated Internet functionalities, have changed how scientists and clinicians develop and provide care. School of Nursing researchers are conducting technology-enabled research that is grounded in behavioral theory and guided by principles of team science and user-centered design.

Oncology Nursing

Pitt Nursing has a deep history and perspective on education and research geared toward understanding patient responses to cancer and cancer therapy, including survivorship. Researchers study approaches that address why negative responses occur, as well as novel interventions to improve outcomes and quality of life.

Genomics

Active genomics laboratories at Pitt Nursing focus on approaches geared to improve patient outcomes and understand patient variability to interventions. Pre- and postdoctoral nurse scientists receive training at the beginning of their careers through an NINR-funded training program that allows early career scientists to apply and evaluate these techniques.

Sleep

An individual's sleep patterns and disorders can have tremendous influence on health outcomes and treatment management. Researchers study these effects and possible interventions to address outcome improvement. Additional work focuses on the effect of sleep disruption on caregivers.

DEMOGRAPHICS

In the 2017–18 academic year, 911 students are enrolled in the School of Nursing. Of these, 66 percent are Pennsylvania residents; approximately 18 percent are from groups that are underrepresented within the nursing profession. There are 29 PhD students, 151 students in the doctor of nursing practice (DNP) program, 128 students in the master of science in nursing (MSN) program, and three in certificate programs.

In 2017, the School of Nursing received 1,718 applications for admission to the traditional undergraduate program. Of these, 458 were offered admission, targeting the University-approved 145 openings in the freshman class.

The School of Nursing has 90 full-time faculty (100 percent are doctoral prepared) and 21 part-time faculty.

DEPARTMENTS

Acute and Tertiary Care

Annette DeVito Dabbs, PhD, RN, Chair

Health and Community Systems

Judith A. Erlen, PhD, RN, Chair

Health Promotion and Development

Denise Charron-Prochownik, PhD, RN, Chair

Nurse Anesthesia

John M. O'Donnell, DrPH, MSN, RN, Chair

DEGREE PROGRAMS

Degrees offered at the School of Nursing include the doctor of philosophy (PhD), doctor of nursing practice (DNP), master of science in nursing (MSN), and bachelor of science in nursing (BSN). Degree programs have been accredited by the Commission on Collegiate Nursing Education and, as relevant, the Council on Accreditation of Nurse Anesthesia Education Programs of the American Association of Nurse Anesthetists. Some degree and certificate programs may be offered both on campus and online. Check www.nursing.pitt.edu for up-to-date information.

The **doctor of philosophy** is designed to foster a mature understanding of content, methods, and values of the nursing discipline and its relationship with other fields. The PhD curriculum includes courses in history and philosophy of science, theoretical foundations and methodologies for research, and the structure of knowledge.

The **doctor of nursing practice** prepares nursing leaders for the highest level of clinical practice by helping students to develop clinical, organizational, economic, and leadership skills to design and implement programs of care delivery. Five concentrations are available within the DNP program:

The **master of science in nursing** program offers majors in several nurse specialty roles and other concentrations:

- **Nurse anesthesia** practice spans preoperative assessment to discharge from the recovery area. Nurse anesthetists also formulate and implement a plan of care, serve as patient advocates, and collaborate with other professionals to provide the optimal anesthetic experience. The nurse anesthesia DNP program is accredited by the American Association of Nurse Anesthetists Council on Accreditation of Nurse Anesthesia Educational Programs through 2020. Graduates are eligible to take the National Board for Certification and Recertification of Nurse Anesthetists' national examination.

- **Clinical Nurse Specialists** are advanced-practice registered nurses (APRNs) who are integral to direct patient care, as well as the effectiveness and efficiency of health care across three spheres of influence: patients and clients, nurses, and organizations and systems. These specialists can serve as consultants to other providers, and, in many states, can prescribe medication, durable medical equipment, and various therapies. Additional courses at Pitt Nursing, beyond core curricula required for the APRN, focus on organizational and management theory, public policy, ethics, and grant writing.
- **Health Systems Executive Leadership** is a newly established program refined to address changing leadership needs in today's health care environment. Students take courses online or in class, depending on their track, and can choose from additional coursework offered at the Katz Graduate School of Business, the Graduate School of Public Health, the Graduate School of Public and International Affairs, the School of Education, and the School of Law.
- **Nurse-Midwives** provide services to foster a supportive environment for women and families before, during, and after pregnancy, including well-woman care. The DNP program's curriculum explores the art and science of nurse-midwifery, focusing on the role of providers in population-based health, management of health issues for women, as well as fetuses and neonates, and quality improvement. Graduates are eligible to sit for the national certification exam in nurse-midwifery and apply for state licensure as certified nurse-midwives.
- **Nurse Practitioners** are trained to autonomously diagnose and treat conditions, prescribe medication and conduct tests, design treatment plans with patients, and teach patients and families about managing conditions and medications. Nurse practitioners often serve as primary care providers in clinics, hospitals, home health care services, and outpatient care centers — many in traditionally underserved communities. Specialties at Pitt Nursing are available in adult-gerontology acute and primary care, pediatric primary care, family, neonatal, and psychiatric mental health. Graduates are eligible to sit for discipline-specific national certification exams.
- **Nurse specialty roles** include two areas of concentration:
 - >> The **clinical nurse leader** role was developed by the American Association of Colleges of Nursing in 2003 to identify and test ways to improve patient safety, health care coordination, effectiveness, and efficiency of care delivery in a fiscally responsible manner. The curriculum covers team leadership, information systems, patient advocacy, and — most importantly — use of evidence-based information to design, implement, and evaluate processes and delivery of patient care. Graduates are eligible to sit for certification through the Commission on Nurse Certification.
 - >> **Nursing informatics** combines cognitive, computer, information, and nursing sciences to prepare students to develop and evaluate information systems that support, enhance, and manage patient care. Graduates are eligible to take the nursing informatics certification exam.

- The **Neonatal Nurse Practitioner Program** prepares graduates to manage the health care of high-risk infants and children up to age 2 in clinical settings.
- MSN students may consider minoring in **health care genetics, nursing administration, nursing education, nursing informatics, nursing research, and gerontology for nurse practitioners**.
- Students can enroll in **post-MSN/DNP** certificate programs for **adult-gerontology acute care nurse practitioner, gerontology for nurse practitioners, health care genetics, neonatal nurse practitioner, nursing research, nursing education, nursing informatics, psychiatric mental health practitioner, and school nurse**.

In collaboration with the Dietrich School of Arts and Sciences, the **bachelor of science in nursing (BSN)** uses the behavioral and biological sciences as a theoretical foundation for professional nursing education. Nursing skills are first practiced in the school's skills laboratory. Schools, clinics, senior citizens' centers, and long-term and acute-care facilities host clinical training opportunities. Supervised clinical experiences begin in the sophomore year.

Junior-year nursing courses focus on the care of individuals and families who are experiencing the stress of illness. Senior-year students provide care to those experiencing more complex illnesses and problems, as well as care in the community.

The **Undergraduate Research Mentorship Program** provides students with the opportunity to undertake research tasks with faculty and develop their own research questions or problems. Hundreds of BSN students have been enrolled in the program since its creation nearly a decade ago.

Students who successfully complete the undergraduate BSN are eligible to take the National Council Licensure Examination to become **registered nurses (RNs)**.

Additional BSN programs offered are the **RN Options—Early Admission to the MSN or DNP**, designed for registered nurses who completed an accredited diploma/associate degree program and wish to continue their education, and the **Accelerated Second Degree BSN**, which can be completed in three consecutive terms and is designed for those who have earned a baccalaureate or graduate degree in another discipline.

Post-baccalaureate certificates are available in **health care genetics, nursing research, and school nurse**.

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COMMUNITY

Undergraduate senior nursing students spend 70 hours in clinical rotations in community settings, including independent living facilities, hospice care, health clinics, and geriatric care. Underserved populations benefit through the students' experiences at the Allegheny County Jail, Schuman Juvenile Detention Center, and the Allegheny County Health Department. Students also work with various community service providers, such as midwifery centers, food banks, and public schools. Clients with veterans' health issues also work with the students.

RESEARCH AND PRACTICE CENTERS

Center for Research and Evaluation

Human Simulation and Skills Laboratories

RESEARCH HUBS

Behavioral Mechanism of Symptoms and Cancer Treatment Adherence

Excellence in eHealth Research

Genomics of Patient Outcomes



SCHOOL
OF NURSING





PATRICIA DOWLEY KROBOTH, PHD, is the dean of the School of Pharmacy, Dr. Gordon J. Vanscoy Professor of Pharmacy, Distinguished Service Professor of Pharmacy, and professor of pharmaceutical sciences. Prior to being appointed dean in 2002, she served as chair of the Department of Pharmacy and Therapeutics (1988 to 1996), then chair of the Department of Pharmaceutical Sciences (1996 to 2002). She has had hands-on experience with all aspects of academic pharmacy, including practice, research, teaching, and administration. She sustained continuous funding for her research program for more than 20 years. Dr. Kroboth is an elected fellow of the American College of Clinical Pharmacy (1991), the American Association for Pharmaceutical Scientists (1996), and the American

Association for the Advancement of Science (2016). In 2013, she received the American College of Clinical Pharmacology Award for Mentoring in Clinical Pharmacology.

Dr. Kroboth has led the Pitt Pharmacy community to a shared vision for the School of Pharmacy, which is now a leader in education, a research school of distinction, and an innovator in pharmacy practice, including the pharmacist's role in the community. The school is considered among the elite schools of pharmacy and is noted for exceptional educational programs and research spanning from drug discovery to new models of care — all focused on improving health.

School of Pharmacy

OVERVIEW

Chartered in 1878 and accredited by the Accreditation Council for Pharmacy Education, the School of Pharmacy is the oldest of the University of Pittsburgh's Schools of the Health Sciences.

Pitt Pharmacy is providing innovations and discoveries that solve complex medication-based problems of today and tomorrow. The innovators are Pitt Pharmacy people — students, alumni, faculty, and staff. Together, they are:

- Discovering new drug entities;
- Developing new drug delivery systems;
- Identifying ever more effective ways for pharmacists to deliver patient care; and
- Defining the future of pharmacy education.

Pitt Pharmacy is personalizing the education of its students by helping all students find their niches in the expansive environment that is health care; engaging students in learning experiences that accelerate their professional growth; preparing students to innovate, to lead, and to improve health; and getting students to expert-level faster.

Pitt Pharmacy is improving the health of people where they live and work and is shaping pharmacist care delivery in the community and in health care institutions.

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In 2016, the School of Pharmacy was **ranked ninth among 125 PharmD-granting institutions** by *U.S. News and World Report*. Faculty members have garnered extensive funding for their research from the National Institutes of Health, the National Science Foundation, the Agency for Healthcare Research and Quality, the U.S. Department of Defense, industry, and other foundations and associations.

Professional and graduate teaching and learning take place in Salk Hall and the newly constructed Salk Pavilion, which is a **five-story, 80,000 square-foot research tower**. The Elmer H. Grimm Sr. Pharmacy Museum honors the history of pharmacy. The Salk Polio Vaccine display commemorates the development of the killed-virus polio vaccine by a team of University researchers led by Jonas Salk, MD.

RESEARCH STRENGTHS

[New Medications for Unmet Medical Needs](#)

Traditional approaches to drug discovery have grown exponentially more expensive and have produced fewer new drugs. Pitt researchers have developed computational and screening methodologies that include informatics and the principles of medicinal chemistry, biology, and human health. They are discovering patentable chemical entities for new medication development and designing novel drug delivery formulations for drugs that are currently in clinical trials.

[Health and Wellness in the Community](#)

Pharmacy faculty members are developing new community models of patient care and testing and evaluating these models with corporate and independent pharmacy partners. They have led the way in establishing a statewide network of pharmacists, with quality metrics to assist insurance companies in meeting patient needs. They are addressing the opioid epidemic in the community through educational and research approaches, as well as providing technical assistance to specific communities. Pitt Pharmacy faculty are also developing policy to shape health care and enhancing access to care and pharmaceuticals for patients with chronic diseases—many of whom face significant barriers to health care.

[Clinical Pharmaceutical Sciences](#)

Basic research takes on new meaning and has direct impact when it results in improved patient care. Building a bridge from bench to bedside and to clinics around the world, School of Pharmacy faculty research has transformed lives. From laboratory development and clinical application of dosage forms and regimens, faculty research has helped make liver transplantation possible and is saving the lives of women worldwide by preventing the transmission of HIV. Research has also led to the development of national guidelines for drug dosages in patients with kidney disease.

Pharmacogenetics

Faculty are implementing pharmacogenetics testing in patients as part of clinical practice through the school's partnership with UPMC. This approach is known as precision medicine. Pitt Pharmacy is on the forefront of pharmacogenetics practice and education. Test2Learn is an award-winning approach that personalizes learning for pharmacists, students, and other providers who use their own pharmacogenetic information for learning.

DEMOGRAPHICS

The School of Pharmacy enrolled 115 students in the PharmD Class of 2021. In fall 2017, 81 students were enrolled in the pharmaceutical sciences graduate program: 50 PhD students, 30 MS students, and one non-thesis MS student.

The school graduated its inaugural class of seven students from its Master of Science in Pharmacy Business Administration Program (offered in collaboration with the Katz Graduate School of Business) in December 2016.

DEPARTMENTS

Pharmaceutical Sciences

Wen Xie, MD, PhD, Chair

Pharmacy and Therapeutics

Amy L. Seybert, PharmD, Chair

DEGREE PROGRAMS

Through personalized education, the School of Pharmacy seeks to graduate students who are decision makers and leaders prepared to work in health care teams, become entrepreneurs and business leaders, develop the next pharmacy care model, make important discoveries, and lead research groups .

Degrees offered at the School of Pharmacy include doctor of pharmacy (PharmD), doctor of philosophy (PhD), master of science (MS), and master of science in pharmacy business administration (MSPBA). The bachelor of science (BS) is available only to students who are also enrolled in the PharmD program.

The **doctor of pharmacy** is a four-year, full-time professional degree program. Before entering the program, students must complete a minimum of two years of prerequisite courses. Optional areas of concentration within the PharmD program include community leadership and innovation in practice, global health, pediatrics, pharmacotherapy, pharmacy business administration, and research.

The **doctor of philosophy** provides a foundation for students to become independent researchers in basic or clinical pharmaceutical sciences. Graduate training includes an original research project leading to a final thesis or dissertation. All courses are completed during the first two years.

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PhD students may specialize among:

- **Biochemical pharmacology** focuses on the mechanisms responsible for drug and other xenobiotic and gene actions on living systems in health and disease. Among areas of study are behavioral, cardiovascular, and endocrine pharmacology; neuropharmacology; immunopharmacology; chemotherapy; toxicology; and metabolic diseases.
- Students in the **Clinical Pharmaceutical Sciences Program** investigate clinical and mechanistic elements of experimental and approved drug therapy. Among areas of study are neuroscience, infectious diseases, nephrology, and clinical trials simulation. Training includes a thorough grounding in translational medicine.
- **Medicinal chemistry** encompasses drug discovery and prepares students to understand the molecular-level activities and behavior of chemical substances. Computational, biochemical, and cell-based screening technologies are used to identify possibly pharmacologic compounds. Research activities include the identification, synthesis, and development of new chemical molecules suitable for biological studies, as well as potential therapeutic use.
- **Pharmaceutics** concentrates on pharmaceutical dosage design and interaction within the human body. Topics include physical pharmacy, bioanalysis, drug delivery and targeting, drug metabolism, drug transport, pharmacokinetics, and pharmacodynamics. Also integral to this area of concentration are principles of dosage form design and optimization of drug product performance.

- Students in **pharmaceutical outcomes and policy research** investigate the impact and outcomes of pharmaceutical products, pharmacy services, and pharmaceutical policies across health care systems toward the mission of advancing knowledge about the safety and effectiveness of medicines and pharmacy's role in improving population health.

The **master of science/pharmaceutical sciences** degree program develops basic and/or clinical research skills to prepare students for the pharmaceutical or biotechnology workforce or for entry into a PhD program. The program attracts students interested in drug discovery, delivery, and metabolism, as well as pharmacology, pharmacokinetics, and pharmacodynamics.

The **master of science in pharmacy business administration** is designed for emerging pharmacy professionals seeking executive positions. The program offers a path to obtaining an in-depth understanding of the business of medicines and learning strategies to innovate and solve real-world problems.

POST-PHARMD RESIDENCY PROGRAMS

Ambulatory Care Pharmacy
Cardiology Pharmacy
Community Pharmacy
Critical Care Pharmacy
Family Medicine
Geriatrics
Health System Pharmacy Management
Infectious Diseases Pharmacy
Internal Medicine Pharmacy
Managed Care Pharmacy
Medication Use Safety
Oncology Pharmacy
Pharmacy Practice
Psychiatric Pharmacy
Solid Organ Transplant Pharmacy
Underserved Care/Global Health

RESEARCH CENTERS

Computational Chemical Genomics Screening Center
Center for Clinical Pharmaceutical Sciences
Center for Drug Abuse Research
Center for Pharmacogenetics
PittPharmacy Community Leadership and Innovation in Practice Center
Drug Design, Delivery, and Development Center



DONALD S. BURKE, MD, has served as dean of the Graduate School of Public Health and associate vice chancellor for global health at the University of Pittsburgh since 2006. He is also Distinguished University Professor of Health Science and Policy.

A native of Cleveland, Ohio, Dr. Burke received his BA from Western Reserve University and his MD from Harvard Medical School. He trained in medicine at Boston City and Massachusetts General Hospitals and in infectious diseases at the Walter Reed Army Medical Center. He served 23 years on active duty in the U.S. Army, where he conducted research on prevention of diseases of military importance.

Throughout his professional life, Dr. Burke has studied prevention and control of infectious diseases of global concern, including HIV/AIDS, influenza, dengue, and emerging infectious diseases. He lived in Thailand for six years, worked extensively in Cameroon,

and conducted field epidemiology and vaccine studies in numerous other developing countries. He has approached epidemic control using strategies “from the bench to the bush.” He has written more than 300 peer-reviewed academic publications.

Dr. Burke now leads a trans-disciplinary team that develops computational models and simulations of epidemic infectious and chronic diseases and uses these simulations to evaluate prevention and control strategies. He currently serves on the Board of Health for Allegheny County. Dr. Burke is a fellow of the American Association for the Advancement of Science, the American Academy of Microbiology, and the American Epidemiological Society; and he is an elected member of the National Academy of Medicine.

Graduate School of Public Health

OVERVIEW

Since its founding in 1948 with a \$13.6 million grant from the A.W. Mellon Educational and Charitable Trust, the University of Pittsburgh Graduate School of Public Health (Pitt Public Health) has focused on a mission of research, education, and service.

Opened in 1950 as the 13th public health school in the nation, Pitt Public Health's first emphasis was on occupational/industrial health and hygiene at a time when Pittsburgh was the world's largest producer of steel. The school has since broadened its efforts to include chronic disease, women's health, cancer, human genetics, and geriatrics. Research continues in infectious disease, workplace and environmental safety, infant mortality, stroke, heart disease, and radiation safety. As a result, Pitt Public Health research grants have increased dramatically, from roughly \$800,000 at the school's founding to more than **\$55 million** in 2017 alone — amounting to more than **\$2.5 billion** in research revenues in all. **In terms of NIH funding, Pitt Public Health ranked fifth among such schools in fiscal year 2017, with nearly \$50 million.**

Pitt Public Health understands that new public health challenges emerge every day, from environmental health to HIV, handgun violence, Zika, Medicare reform, and opioid addiction. Like Jonas Salk's polio vaccine team, Pitt Public Health responds to today's health threats by preparing the next generation of public health leaders to use innovation as a catalyst for problem solving.

RESEARCH STRENGTHS

Computational Modeling and Simulation

Few academic institutions can approach the breadth and degree of expertise available in computational modeling at Pitt Public Health. Investigators use computing power to devise outbreak scenarios and design effective public health strategies to fight the spread of infectious disease. Computer models serve as virtual laboratories to simulate population movements and the effects of interventions such as school and business closings, the availability of treatments and vaccines, and the influence of individual health care decisions.

In addition, the school's Public Health Dynamics Laboratory applies computational techniques broadly to mobilize activities across all the Schools of the Health Sciences, including projects in epidemiology, behavioral health, community health, virology, public health preparedness, and health policy.

Medicare and Medicaid Policy Research

Medicare and Medicaid policy are at the heart of American health policy. The Department of Health Policy and Management and the Health Policy Institute offer in-depth courses on both programs that also examine the powerful forces influencing health policy reform efforts. Significantly, Pitt policy research often finds a spotlight on this important national stage.

Opioid Addiction and Overdose Prevention

Addiction-related fatalities in the region have more than tripled in the past decade, and Pitt Public Health is conducting research to address the knowledge gaps of the opioid epidemic. Research areas include studying statewide data for patterns of prescription, hospitalization, and mortality; analyzing barriers to prevention and to naloxone access; and using social media for real-time surveillance of the opioid epidemic.

LGBT Health Research

The Center for LGBT Health Research brings a public health perspective to analyze social, cultural, and individual factors that influence the health and well-being of lesbian, gay, bisexual, and transgender (LGBT) communities. Research areas include LGBT health disparities like increased risks of breast cancer, HIV, hepatitis, and stress-related conditions. Pitt researchers are tackling an agenda that starts with careful documentation of which disparities exist in sexual minority populations, addresses causes, and, finally, tests the efficacy of interventions designed to modify those disparities.

DEMOGRAPHICS

In the 2017–18 academic year, the Graduate School of Public Health had a total enrollment of 592 degree-seeking students, with 110 in behavioral and community health sciences, 72 in biostatistics, 31 in environmental and occupational health, 122 in epidemiology, 87 in health policy and management, 61 in human genetics, 74 in infectious diseases and microbiology, and 25 in the Multidisciplinary Master of Public Health Program. There are 165 faculty members with primary appointments in Pitt Public Health and an additional 235 faculty members with joint or adjunct appointments.

School of
Dental Medicine

School of Health
and Rehabilitation
Sciences

School of Medicine

School of Nursing

School of Pharmacy

Graduate School
of Public Health



GRADUATE
SCHOOL
OF PUBLIC
HEALTH

DEPARTMENTS

Behavioral and Community Health Sciences

Steven M. Albert, PhD, Chair

Biostatistics

Shyamal D. Peddada, PhD, Chair

Environmental and Occupational Health

Bruce R. Pitt, PhD, Chair

Epidemiology

Anne B. Newman, MD, MPH, Chair

Health Policy and Management

Mark S. Roberts, MD, MPP, Chair

Human Genetics

Dietrich A. Stephan, PhD, Chair

Infectious Diseases and Microbiology

Charles R. Rinaldo Jr., PhD, Chair

DEGREE PROGRAMS

The professional and research-oriented degrees offered include master of public health (MPH), doctor of philosophy (PhD), doctor of public health (DrPH), master of science (MS), and master of health administration (MHA).

A course of study in **behavioral and community health sciences** (DrPH, PhD, MPH) prepares students for leadership positions in the social and behavioral sciences areas of public health practice, as well as for conducting research into the social determinants of health.

Courses in **environmental and occupational health** (DrPH, PhD, MPH, MS) emphasize fundamental principles of disease processes and a practice-oriented, interdisciplinary approach to leadership and research in environmental health.

Epidemiology (DrPH, PhD, MPH, MS) studies prepare students to apply theory and research methods in a variety of public health settings. Areas of emphasis within the programs include aging, cancer, clinical trials, global health, lifestyle intervention, and women's health.

Courses in **biostatistics** (PhD, MS) emphasize statistical theory and methods to prepare students to be effective statistical collaborators in interdisciplinary studies, lead the design and execution of studies, and develop biostatistical methodology.

Health policy and management (PhD, MPH, MHA) curricula educate public health researchers whose studies focus on health care costs, access, and quality—critical studies that inform policy affecting the organization, financing, and delivery of health care and public health services. Courses for the **master of health administration** and **master of public health** prepare graduates for managerial roles in health care and public health systems, managed care, health insurance, or long-term care organizations.

Studies in **human genetics** (PhD, MPH, MS, MS genetic counseling, MS/MPH) prepare students for research or public health practice careers in academia or industry with customizable emphases, including laboratory genetics, statistical genetics and genetic epidemiology, or genetic counseling. Interdisciplinary training in statistical genetics is also available through the Department of Biostatistics. Students preparing for a master of science in genetic counseling receive cutting-edge scientific training in human genetics, clinical experience, and understanding of the psychological and social aspects of counseling.

The course of study for **infectious diseases and microbiology** (PhD, MPH, and MS) prepares students for competitive research, teaching, and public health practice careers in academia, government agencies, and private industry through coursework emphasizing pathogen biology, immunology, cell biology, and molecular biology.

The department offers two distinct MPH concentrations:

- The concentration in **infectious disease pathogenesis, eradication, and laboratory practice** combines pathogen biology, immunology, and epidemiology within the broader framework of public health, suitable for occupations in public health education, analysis, and research in the nonprofit, government, or private sectors.
- The concentration in **infectious disease management, intervention, and community practice** focuses on infectious diseases, including HIV and emerging public health threats across the globe.

The **multidisciplinary master of public health** gives clinicians and other professionals a curriculum that prepares them to integrate public health principles into their careers. The curriculum is tailored to individual student needs but often includes leadership in academic and administrative health settings, research, preventive medicine, public health and evidence-based practice, and global health.

SPECIALTY DEGREE PROGRAMS

Accelerated Bachelor's/Master's Program

Outstanding Pitt undergraduates may apply in their third year and enroll in graduate classes in their fourth year. Students satisfy remaining undergraduate requirements to graduate on time with a bachelor's degree in the fourth year and a master's degree in the fifth year—saving up to a full year in time and tuition.

Joint and Dual Graduate Degrees

Pitt Public Health offers joint degrees with other University of Pittsburgh departments and schools, allowing students to concentrate on areas of particular interest. These programs combine public health with anthropology, business, international affairs/international development, social work, and law.

School of
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of Public Health



Certificates

Pitt Public Health offers opportunities for students to obtain a certificate indicating focused coursework and training in specific areas of concentration. These programs include community-based participatory research and practice, environmental health risk assessment, evaluation of public health programs, global health, health care systems engineering, health equity, health systems leadership and management, LGBT health, and public health genetics.

RESEARCH AND PRACTICE CENTERS AND INSTITUTES

- Center for Aging and Population Health**
- Center for Bioethics and Health Law***
- Center for Global Health***
- Center for Health Equity**
- Center for LGBT Health Research**
- Center for Occupational Biostatistics and Epidemiology**
- Center for Public Health Practice**
- Epidemiology Data Center**
- Health Policy Institute**
- Institute for Evaluation Science in Community Health**
- Pennsylvania Public Health Training Center**
- Pitt Men's Study**
- Public Health Dynamics Laboratory**
- The Pennsylvania/MidAtlantic AIDS Education and Training Center**

**Indicates affiliation throughout the Schools of the Health Sciences*



446 Bridges

27 Colleges and universities

6 Fortune 500 companies

6 Super Bowl championships

5 Stanley Cup victories

5 World Series championships

3 Rivers





City of Pittsburgh

(city of bridges)

OVERVIEW

Pittsburgh is home to three rivers (the Allegheny and Monongahela converge here to form the Ohio), more bridges than any other city in the world (by some estimates), **27 colleges and universities**, **six Fortune 500 companies**, and the remnants of Fort Duquesne, which was built in the 1750s and later replaced by Fort Pitt.

The population of the seven-county region is nearly 2.4 million, with some 304,000 living within the city. Pittsburgh is **vibrant, safe,** and **affordable**; it features the amenities and liveliness of a large city with small-town civility and a neighborhood feel. While Pittsburghers know well all the city has to offer, it's been ranked one of the best cities for **architecture** by *Travel + Leisure*, the seventh best city for an **active lifestyle** by *WalletHub*, and a **worldwide top city to visit** by *National Geographic Traveller*, all in 2017.



Cultural opportunities abound, with museums, live theater, opera, dance, gallery exhibits, botanical gardens, a zoo, aquarium, and aviary; and an eclectic music scene that spans the symphonic to the serendipitous (Bruce Springsteen has been known to drop in unannounced to join his friends Joe Grushecky and the Houserockers) to the surreal (laser shows paired with rock, pop, and electronic music at the Carnegie Science Center provide a dazzling spectacle). The annual Three Rivers Arts Festival is a summertime staple for music and art lovers and one of many annual festivals and concert series that celebrate jazz, art, folk culture, and more.

Three major professional sports teams—the 2009 Super Bowl champion Pittsburgh Steelers, the 2016 and 2017 Stanley Cup champion Pittsburgh Penguins, and the Pittsburgh Pirates, a franchise that is now a perennial contender (having reached the postseason in 2013, 2014, and 2015 after a long absence) — provide plenty of reasons to cheer, or jeer, depending on the season. In addition, the University is home to a full range of sports teams. The Pitt Panthers typically offer some of the finest performances in college athletics and joined the esteemed Atlantic Coast Conference in 2013. For athletes and spectators alike, there is the Pittsburgh Marathon, usually in early May, when more than 30,000 elite and amateur athletes run up to 26.2 miles through the city of bridges.

Oakland, the neighborhood in which Pitt is located, is unquestionably the intellectual center of the community. In the heart of Pitt’s campus is the 42-story Cathedral of Learning, the second tallest university building in the world and home to more than two dozen Nationality Rooms styled to reflect the culture of the faraway places to which many Pittsburghers can trace their roots.

Pittsburgh’s hills and valleys give way to breathtaking views and are home to **88 neighborhoods**, many of them embracing distinct ethnic and cultural flavor plus traces of Old World attitudes and culture. Possibly the most famous, *Mister Rogers’ Neighborhood*, a children’s television show broadcast from here for 33 years, reflected in its own simple and charming way a nice place to be — which is, perhaps, the best way to describe Pittsburgh.

Photo credits

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FOR MORE INFORMATION

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www.publichealth.pitt.edu

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