$138.8 MILLION
NIH Funding at Vanderbilt in FY 2020

$26.5 MILLION
National Institute of General Medical Sciences

$23.4 MILLION
National Cancer Institute

$13.2 MILLION
National Institute of Diabetes and Digestive and Kidney Disease

Drug developed by Vanderbilt researchers aims to improve memory loss in Alzheimer’s patients

Vanderbilt University’s Warren Center for Neuroscience Drug Discovery has entered into an exclusive worldwide licensing and collaboration agreement with San Diego-based ACADIA Pharmaceuticals Inc., which will seek to develop and commercialize treatments for central nervous system disorders, such as Alzheimer’s disease and schizophrenia. A lead compound in the treatment—VU319, which recently began Phase 1 clinical trials—was discovered by Vanderbilt researchers at the Warren Center, with support from the National Institutes of Health (NIH), and could help slow memory loss accompanying serious brain disorders. The first human trial of VU319 was unique in that it was the first time Vanderbilt University had initiated a drug-discovery effort based on early basic science and advanced it into clinical trials in humans without partnering with a pharmaceutical company. In addition to VU319, the licensing agreement with ACADIA includes other compounds in preclinical development, as well as those in an ongoing discovery program based on early-stage research in the basic sciences.

Clinical applications and research areas include image-guided brain, kidney, liver, pancreas, or prostate surgery; guidance for transorbital therapy; minimally invasive cochlear implant surgery; assistance for deep brain stimulators placement and programming; robotic-assisted cochlear implant surgery; and ophthalmic microsurgery. Forty students have earned their doctorates since the program’s start, and there are 55 current students engaged in research at VISE. In addition, 26 patents and seven licenses have come out of this collaborative work.

NIH training grants

At Vanderbilt, a significant funding mechanism from NIH are National Research Service Awards (NRSA), which include T (training grant) and F (fellowship) awards, with nearly 80 percent of the doctoral students in the biomedical sciences supported by them. The Vanderbilt Medical Scientist Training Program, which has been supported by NIH T awards since 1976, prepares students for faculty and research positions with an integrated curriculum that features a strong core education in medicine and intensive training in scientific inquiry. Successful completion of the program leads to both M.D. and Ph.D. degrees, preparing the next generation of physician scientists. The Initiative for Maximizing Student Diversity at Vanderbilt University, which has been supported by NIH awards since 2000, aims to increase the number of Ph.D.’s. awarded to graduate students in biomedical research who are underrepresented in science.

Currently, Vanderbilt has 74 individual F awards and 24 T awards, which support over 150 students and provide over $7.5 million in annual funding. Students

Vanderbilt Institute for Surgery and Engineering

The Vanderbilt Institute for Surgery and Engineering (VISE), supported in part by $30 million in active NIH grants, many of which are R01, is an interdisciplinary, trans-institutional institute that supports interactions between the university’s Schools of Engineering and Medicine in order to develop methods, devices, algorithms, and systems to improve patient care.
supported by NIH NRSA fellowships have contributed to an understanding of fundamental biological principles and have discovered therapeutic strategies for treating diseases like Charcot-Marie Tooth as well as COVID-19.

Vanderbilt developing ‘socially assistive robots’ to stem loneliness and encourage activity among aging

A multidisciplinary team of engineers, nurses, physicians, and health services researchers from Vanderbilt University and other universities are working together to develop next-generation robotic technology that can help older adults living with forms of dementia. The five-year grant from NIH, totaling $3.1 million, will support research and development of a robotic framework and methodologies that encourage social interaction among older adults in long-term care facilities. The aim of the project is to create a better quality of life for older adults. While there is currently no cure for dementia, research shows that if the at-risk population can be mentally engaged and active, it is possible to slow the progression of the disease and the deterioration of the person’s overall health. This work will help researchers understand how to create robots to act as a coach and peer to facilitate interpersonal connections in a sustainable, meaningful way.

Researchers getting answers to compulsive alcohol use with new experiments into binge drinking

Neuroscientists in the College of Arts and Science, with support from NIH, are now able to predict if someone would become compulsive based on neural activity during the very first time they drank alcohol. Using cellular-resolution calcium imaging and miniature microscopes, the researchers tracked the luminescence of the activity neurons and found that the neurons in drinkers predisposed for compulsive behavior quieted and decreased during drinking events. The neurons in drinkers predisposed for compulsive behavior quieted and decreased activity during drinking events. As a result, the findings helped construct a novel behavioral model, and the team identified the specific cortical-brainstem circuit that serves as both a biomarker and a cellular platform for the eventual development of compulsive drinking behavior. The findings also have implications on the future of other substance abuse studies.

Research team awarded $9 million to study extracellular RNA in colorectal cancer

A multidisciplinary team of investigators at Vanderbilt University and Vanderbilt University Medical Center has received a five-year, $9 million program project grant from the National Cancer Institute. The award will support multiple projects that aim to define fundamental biological principles about how colorectal cancer cells communicate through extracellular RNA signaling. Colorectal cancer is the second leading cause of cancer death in the United States, and the research team will work to understand how extracellular RNA signaling is involved in all aspects of tumor development and metastasis. The goal is to define the “rules of the game” for extracellular RNA communication.

Researcher shares more than 3,000 brain scans to support the study of reading and language development

With support from NIH, a neuroscientist in Peabody College of education and human development is publicly releasing two large-scale neuroimaging datasets on reading and language development to support other researchers around the world who are working to understand how academic skills develop in childhood. The datasets include more than 3,000 magnetic resonance imaging scans that explore brain structure and function in school-age children. Making this data publicly available allows other researchers to extend the body of foundational research stemming from these datasets, which include several tasks in both the visual and auditory modalities.

Investigators lead effort to create map of the human kidney

An audacious project is underway in the School of Medicine, with support from NIH, to create a high-resolution, three-dimensional “atlas” of the human kidney with the goal of learning how the normal kidney functions down to the molecular level. Short of mandating universal diabetes treatment, regular exercise, and low-calorie diets, little can be done to stem the rising tide of kidney failure—unless scientists can figure out why exactly the kidney’s filtration units stop working. Diabetes is the leading cause of end-stage renal disease, one of the nation’s most debilitating and expensive medical conditions. This “atlas” approach is an important step forward in understanding human biology as well as precision medicine.