National Institutes of Health

VANDERBILT UNIVERSITY

$119.6 million
NIH funding at Vanderbilt in FY 2017

$23 million
from National Institute of General Medical Sciences (NIGMS)

$15.8 million
from the National Cancer Institute (NCI)

$14.9 million
from the National Institute of Mental Health (NIMH)

Vanderbilt signs licensing agreement to develop new schizophrenia drug

Vanderbilt University has signed separate licensing and research collaboration agreements with Lundbeck, a global pharmaceutical company based in Denmark, to develop a novel approach for treating schizophrenia. Under the terms of the licensing agreement, Lundbeck has exclusively licensed rights to compounds developed by the Vanderbilt Center for Neuroscience Drug Discovery (VCNDD), that were developed with the support of the National Institute of Mental Health and act on a receptor in the brain that has been implicated in schizophrenia. These compounds have been shown in animal models to have antipsychotic-like effects and to improve cognitive performance with low risk of side effects. Schizophrenia is thought to result from the excessive release of the chemical messenger dopamine in the brain and these compounds have been shown in animal models to block dopamine release in several key brain regions through the selective activation of a muscarinic acetylcholine receptor. VCNDD incorporates the highest level of drug discovery into academic research, and is able to advance the most exciting scientific breakthroughs beyond the lab and toward the development of patentable and marketable drugs suited for clinical studies. It is staffed by dozens of scientists, most of whom bring industry experience to this collaborative, academic setting.

Vanderbilt begins Phase 1 trials of new Alzheimer's drug

A potential new drug for Alzheimer's disease and schizophrenia developed by Vanderbilt University scientists was administered July 29 to the first volunteer enrolled in a first-in-human phase 1 clinical trial at the Vanderbilt Institute for Clinical and Translational Research. Earlier studies suggest that the compound, a small molecule called VU319, may have potential for reducing memory impairments in brain disorders such as Alzheimer's disease and schizophrenia. The randomized, double-blind, and placebo-controlled study was conducted in about 50 healthy adult volunteers over the next 12 months to determine the compound's safety, tolerability, and bioavailability when taken orally with or without food. VU319 was developed by a team of scientists at the VCNDD and was funded by a NIH National Cooperative Drug Discovery/Development grant.

Steerable robotic needle for biopsies

Collaboration between a mechanical engineer at Vanderbilt University and a pulmonologist at Vanderbilt University Medical Center has resulted in a NIH R01 grant to develop a steerable robotic needle to safely biopsy hard-to-reach lung nodules. Together the team has designed a system that 1) helps pulmonologists more accurately reach sites in the peripheral lung to biopsy them, and 2) reaches suspicious nodules by deploying a steerable needle from a bronchoscope's tip. The need for better biopsy approaches is motivated by the fact that lung cancer kills more than 150,000 Americans each year and that survival depends on early diagnosis, which requires a biopsy to be definitive. Current approaches make accurate biopsies challenging or impossible for many nodules. The new system harnesses the capabilities of a new class of steerable needles to extend the range of bronchoscopes and reliably and safely access nodules throughout the lung, including in the peripheral zone.

Robert Webster, Ph.D., left, Fabien Maldonado, M.D., and colleagues are developing a steerable robotic needle to more safely biopsy lung nodules that are difficult to reach. (Photo: Vanderbilt University)

Alzheimer's disease and altered pain perception

Already suffering from Alzheimer's disease, Todd Monroe's grandmother was dealt a second blow - breast cancer. Because she couldn't articulate what was wrong, the cancer was advanced when she was diagnosed. Managing her pain became a top priority, but that was a challenge: she couldn't tell the caregivers in the nursing home where she lived when she was in pain. Monroe, Ph.D., R.N., FAAN, assistant professor of Nursing, credits his grandmother's experience with making him aware of the issues facing clinicians who must assess pain and of the risk of under-treated pain in persons with dementia. His most recent research, supported by NIH's National Institute on Aging, found that people with Alzheimer's disease might not perceive pain as readily as healthy older adults, which may lead to underreporting of pain and delays in treatment. Monroe and his colleagues suggest that this alteration in pain detection may be one reason that people with Alzheimer's disease and pain tend to be under-medicated. Altered pain detection also places people with dementia at increased risk for delay in detecting underlying conditions that could have a serious impact.

VISE wins $1.4 million NIH grant to reboot robotic surgery system

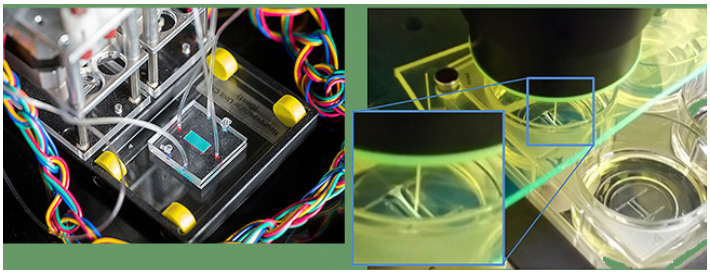
A Vanderbilt Institute for Surgery and Engineering (VISE) team is developing an image guidance interface for the da Vinci robotic surgery system to make partial kidney removal a less invasive "gold standard" when small tumors are involved. In such cases, removing part of a kidney with minimally invasive robotic surgery is often best for a patient's recovery and health, but many surgeons hesitate to do so because the robotic partial nephrectomy procedure is so complex. The team, which includes biomedical and mechanical engineers and a urologic surgeon, has received a four-year, $1.4 million NIH grant to develop enhanced software for a "surgical GPS" system to provide intraoperative guidance to surgeons. With a three-dimensional map of subsurface tumors, delicate blood vessels, and other structures, surgeons can cut in exactly the right place before they make incisions. This innovation has the potential to dramatically enhance long-term outcomes and quality of life for patients by preserving kidney function and saving lives by more accurately removing masses and reducing positive tumor margin rates.

$2.5M grant to study link between math and reading comprehension

A Vanderbilt University research project working to identify the role language comprehension plays in math problem-solving and reading comprehension will continue its work thanks to a four-year, $2.5 million grant by NIH's Eunice Kennedy Shriver National Institute of Child Health and Human Development. The research, which is being conducted at Vanderbilt's Peabody College of education and human development, represents one of four Learning Disabilities Innovation Hubs established by NIH in 2012 to address the causes, symptoms, and treatments of learning disabilities affecting reading, writing, and mathematics. The team is working to identify what connects math problem-solving to reading comprehension, with a focus on the needs of non-native English speakers through structuring an innovative approach that embeds language comprehension into math problem-solving and reading comprehension instruction. The study looks to see if improvement in language comprehension explains improvement in both areas of academic performance. If so, embedded language comprehension instruction in one area may prove successful for producing effects on both outcomes.

Assessing efficacy of novel epilepsy drugs through tissue-chip research

An interdisciplinary team of Vanderbilt University researchers has received a two-year, $2-million federal grant to develop an "organ-on-chip" model for two genetic forms of epilepsy. These disorders affect both brain and heart and improved modeling could lead to new drug treatments. The project is one of 13 "tissue chip" awards announced by the National Center for Advancing Translational Sciences, part of NIH. The goal is for these tissue chips to provide more accurate platforms to understand diseases, and to be more predictive of the human response to drugs than current research models, thereby improving the success rate of candidate drugs in human clinical trials.



NeuroVascular Unit and its perfusion controller, left, and the cardiac I-Wire system, right. (Photo: Vanderbilt University)

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