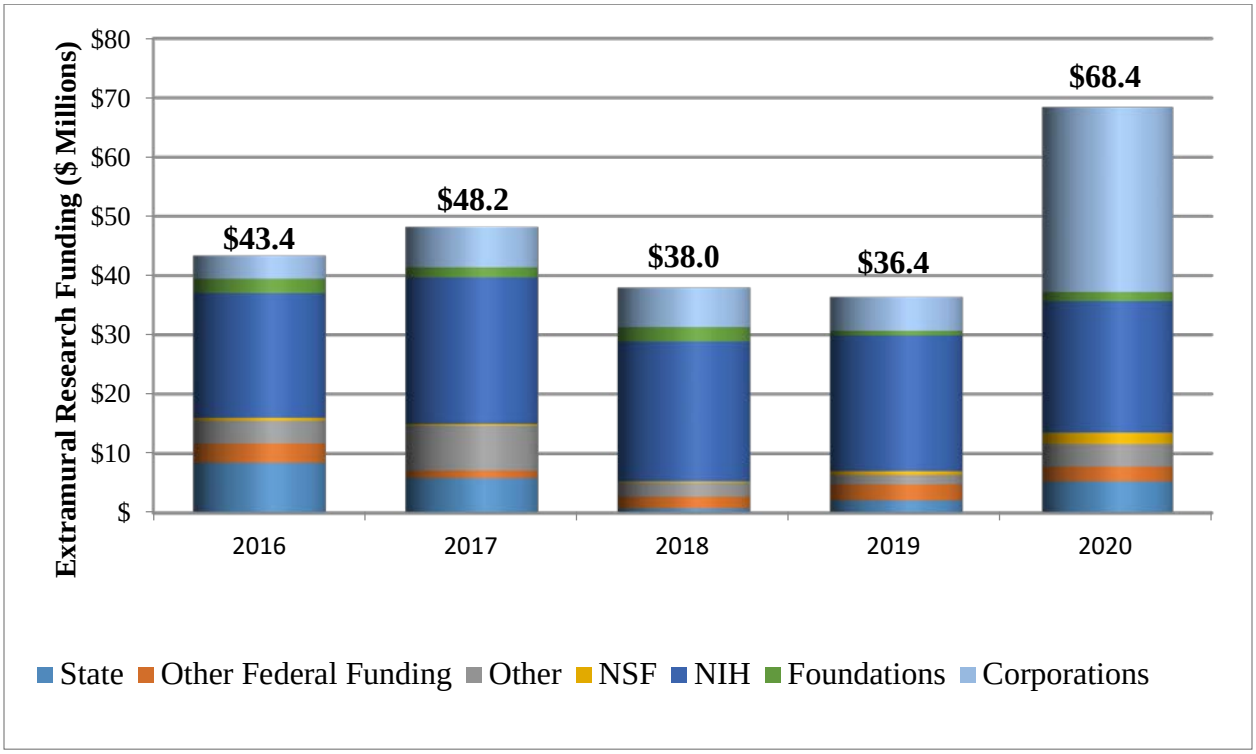
SUBMITTED BY: **STEPHEN M. LANIER, PH.D.**
VICE PRESIDENT FOR RESEARCH
DIVISION OF RESEARCH REPORT

EXTERNAL RESEARCH FUNDING
Q1 – FY 2020



Sponsor Type	2016	2017	2018	2019	2020
Corporations	$3,888,528	$6,820,345	$6,649,281	$5,701,772	$31,184,919
Foundations	$2,451,187	$1,711,166	$2,444,374	$791,395	$1,543,894
NIH	$21,031,422	$24,719,227	$23,575,414	$22,879,294	$22,180,696
NSF	$496,454	$298,758	$227,404	$645,607	$1,928,561
Other	$3,774,318	$7,528,615	$2,322,718	$1,566,065	$3,795,484
Other Federal Funding	$3,287,179	$1,282,798	$1,967,279	$2,702,928	$2,498,917
State	$8,443,934	$5,857,185	$782,173	$2,108,425	$5,299,106
Grand Total	**$43,373,022**	**$48,218,094**	**$37,968,643**	**$36,395,486**	**$68,431,578**

Award Data for FY 2015 and beyond reflects a change in the methodology used to capture clinical trial awards/contracts.

Award Data for FY 2016 and beyond includes clinical trial awards/contracts involving WSU Karmanos Cancer Institute and the School of Medicine that were not previously processed through the WSU Office of Sponsored Programs.

RESEARCH EXPENDITURES AND RANKING
NATIONAL SCIENCE FOUNDATION
AMONG 400 PUBLIC UNIVERSITIES

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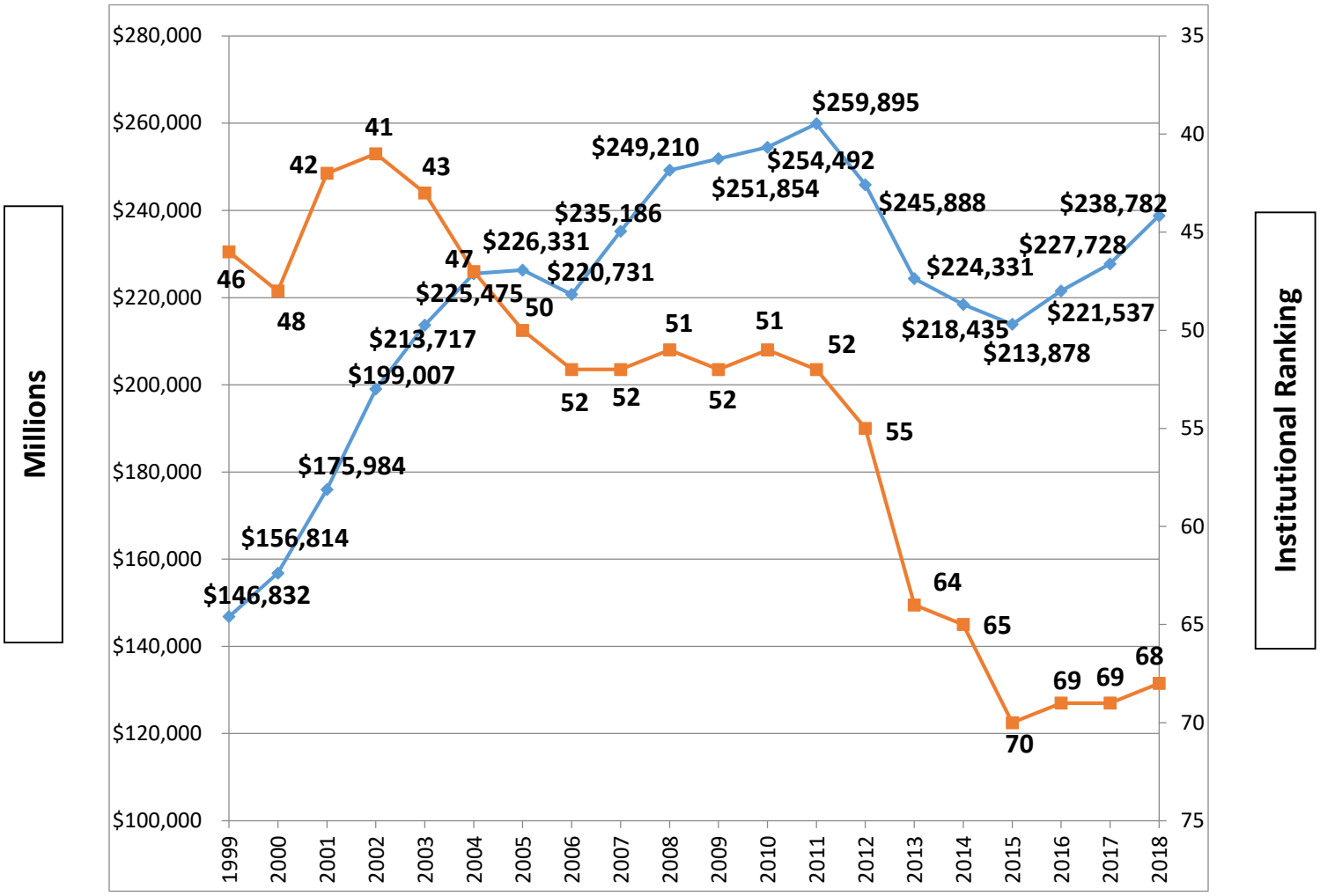
FY1999 - FY2018



FY 2020 Q1 RESEARCH PRESS RELEASE HIGHLIGHTS

$1.7 M grant to Wayne State College of Engineering aims to improve oral delivery of insulin - Diabetes is a chronic disease that occurs when the pancreas does not produce enough insulin — a hormone that regulates blood sugar— or the body cannot effectively use the insulin it produces. According to the Diabetes Research Institute Foundation, the disease is increasing at an alarming rate in the United States, with an estimated 30.3 million people currently with diabetes.

Oral insulin is potentially prescribed to patients diagnosed with diabetes to improve their quality of life. However, current oral protein formulations of insulin face multiple obstacles during their gastrointestinal transport and absorption, resulting in lower therapeutic benefits. This includes difficulty penetrating the intestinal mucus layer and the epithelial cell layer to reach the blood. While scientists have made improvements in mucus-penetrating and absorption-enhancing technologies, current oral doses of protein drugs to treat diabetes remains low in absorption and bioavailability, and can increase the risk of leaky gut, autoimmune disease, bacterial infections and inflammatory bowel diseases.

Therefore, there is an urgent need for a safe and efficient oral delivery technology that will enhance protein transport, and to increase oral insulin with high bioavailability. With the help of a $1.7 million grant from the National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health, a team of researchers led by Zhiqiang Cao, Ph.D., associate professor of chemical engineering and materials science and graduate program director in Wayne State's College of Engineering, will explore ways to address these issues.

Wayne State receives NSF grant to enhance cybersecurity of chemical process control systems – Smart manufacturing processes are becoming more automated with the help of algorithms that aim to boost profits, reduce resource use and decrease human error. In industries using chemical reactions, separation and transport, these smart manufacturing processes are expected to enhance production efficiency. In health care, water treatment and irrigation systems, smart manufacturing is also making an impact; however, they face the challenge of cyberattacks on control systems that perform communication and computation to enable automation of these systems.

With the help of a three-year, $500,000 grant from the National Science Foundation, a research team from Wayne State University will comprehensively evaluate the characteristics of cyberattacks for processes involving chemical processes of different types, and will develop fundamental advances in control theory and algorithms for enhancing cybersecurity of control systems for these processes through control designs integrated with other frameworks such as detection algorithms.

Led by Helen Durand, Ph.D., assistant professor of chemical engineering and materials science in Wayne State's College of Engineering, the team of researchers will work to design stronger safeguards against automation systems attacks that can impact critical factors such as safety, profitability or production volume.

Wayne State and Henry Ford Health System to lead $4 million Detroit-based NIH HEAL Initiative to increase long-term recovery from opioid addiction – The National Institutes of Health launched the "Helping to End Addiction Long-term Initiative" (NIH HEAL Initiative) in April 2018 to improve prevention and treatment strategies for opioid misuse and addiction and to enhance pain management. This initiative aims to improve treatments for chronic pain, curb the rates of opioid use disorder and overdose, and achieve long-term recovery from opioid addiction.

A team of researchers led by Wayne State University received one of 375 grant awards across 41 states made by the National Institutes of Health in fiscal year 2019 to apply scientific solutions to reverse the national opioid crisis. This $4 million award, "Dual-orexin antagonism as a mechanism for improving sleep and drug abstinence in opioid use disorder," will bring together a research team from Wayne State University and Henry Ford Health System to investigate a rigorous treatment method that may offer a new therapeutic approach to reduce opioid addiction relapse.

According to Mark Greenwald, Ph.D., principal investigator on Wayne State's grant and professor and associate chair of research and director of the Substance Abuse Research Division in the Wayne State School of Medicine's Department of Psychiatry and Behavioral Neurosciences, insomnia is common in opioid addictions and is a major predictor of potential relapse. Current medications to treat insomnia have limited results on relapse and may produce unwanted side effects.

Wayne State, Karmanos receive $3.1 million NIH grant to improve quality of life for African American cancer survivors – African Americans have the lowest survival rate of any racial or ethnic group in the United States for most cancers – a problem that is significant in southeast Michigan. These differences are often due to socioeconomic disparities that result in unequal access to medical care, health insurance, healthy food and more. African Americans who survive cancer also have the shortest survival of any racial/ethnic group in the United States for most cancers, according to the American Cancer Society.

A team of researchers from Wayne State University and the Barbara Ann Karmanos Cancer Institute are investigating the combined role that community, interpersonal and individual influences have on the health-related quality of life for African American cancer survivors, and how those influences create racial health disparities between African Americans and white survivors. The team includes Felicity W.K. Harper, Ph.D., associate professor of oncology in the Wayne State School of Medicine and the Karmanos Cancer Institute; Malcolm P. Cutchin, Ph.D., professor in the Institute of Gerontology and the Department of Health Care Sciences in Wayne State's Eugene Applebaum College of Pharmacy and Health Sciences; and Hayley Thompson, Ph.D., professor of oncology in the School of Medicine and associate center director for community outreach and engagement at Karmanos.

The study, "ARISE: African American Resilience in Surviving Cancer," is a five-year, $3.1 million project funded by the National Cancer Institute of the National Institutes of Health that aims to identify targets of change and inform the development of interventions to address causes of poorer health-related quality of life experienced by African American cancer survivors. The study aims to recruit 600 African American cancer survivors living in metropolitan Detroit. The team will work to create a theoretically and community-grounded model of variability in health-related quality of life in African American survivors. They will evaluate the success of the collaboration with a systematic evaluation of community

stakeholders' perceptions of — and attitudes toward — the collaboration experience. They will also collaborate with community stakeholders to disseminate study findings to scientific and lay audiences, translate study findings, and inform future interventions.

Michigan Health Endowment Fund awards $1 million to WSU school health programs – The Michigan Health Endowment Fund awarded $1 million to a pair of Wayne State University Center for Health and Community Impact (CHCI) programs that aim to boost the health and nutrition of school-aged children.

"Building Healthy Communities: Engaging Elementary Schools Through Partnership" and "Dearborn School Health through Integrated Nutrition & Exercise Strategies (D-SHINES)," both of which operate out of CHCI, each received $500,000 for their school-based programs that promote physical activity and healthy eating among students. The grants were part of the Health Fund's 2019 Nutrition and Healthy Lifestyle initiative.

Fatberg display opens at Michigan Science Center – The Michigan Science Center, with support from the Healthy Urban Waters program at Wayne State University and the Macomb County Public Works Office, unveiled a new educational display featuring pieces of the Macomb County fatberg, which was removed from a Macomb County sewer line in 2018. The display is part of a project funded by the National Science Foundation to Wayne State University.

The fatberg was a 19-ton collection of fats, oils, grease and other materials that formed in a sewer pipe in Clinton Township. Prior to its disposal, it was 100 feet long, 11 feet wide and 6 feet tall. It included a large number of baby wipes and other materials that should not be flushed down toilets. Actual pieces of the Macomb County fatberg are included in the display.

The fatberg was removed by the Macomb County Public Works Office, who used the fatberg as an opportunity to educate the public about the problems – and expenses – that can be created by pouring grease down the drain or flushing down wipes and other materials. Researchers at Wayne State conducted a study of the fatberg and are sharing their findings with other sewer system operators. The Michigan Science Center display aims to teach visitors how our community infrastructure can be negatively impacted by these items and provide them with actions they can adopt to mitigate future occurrences of these man-made fatbergs.

The fatberg educational centerpiece was unveiled at the Michigan Science Center on Thursday, Dec. 5. Speakers included Christian Greer, president & CEO of the Michigan Science Center; Candice Miller, Macomb County Public Works Commissioner; and Carol Miller, Ph.D., professor of civil and environmental engineering and director of the Healthy Urban Water program at Wayne State University.

The award number for this NSF-funded project, RAPID: Response to Massive Sewer Blockage for Immediate Flood Mitigation and Future Remedies, is 1903329. The principal investigator on the project is Dr. Carol Miller and the co-principal investigator is Tracie Baker, DVM, Ph.D., professor in the Institute of Environmental Health Sciences at Wayne State.

Health Fund boosts WSU health initiative with $500,000 grant - The Michigan Health Endowment Fund awarded $500,000 to a major new health initiative at Wayne State University that has the potential to reshape how we think about health interventions in southeast Michigan.

Population Health Outcomes aNd Information EXchange (PHOENIX) is a new technology platform hosted by Wayne State University that will collect real-time health data (demographics, vital signs, medical history, diagnostic codes, emergency department visits, etc.) down to the neighborhood level, layering it with social determinants like household income, crime statistics, and access to grocery stores to determine what community factors may be contributing to health challenges.

This new platform will allow researchers, health and human service providers, and nonprofit agencies to tailor health services, design research studies, and evaluate public health programs using the most updated and accurate information. It will also enable service providers to track what areas are most in need of health intervention efforts, as well as the impact of those efforts.

"PHOENIX will change the way we think about population-based health," says Dr. Phillip Levy, a Professor of Emergency Medicine and WSU Assistant Vice President of Translational Research, who is developing the platform. "This will efficiently identify health needs, provide robust and comprehensive data on risk factors and health outcomes, enable rapid evaluation of intervention effectiveness, and create an opportunity for communities, nonprofits, government agencies, and researchers to join forces in pursuit of a better quality of life for all."

The two-year grant will support the creation of the technological infrastructure while concurrently building a coalition of governmental, corporate (both healthcare and non-healthcare related), foundation, community, and academic partners who will work to collaboratively define problems, develop interventions, and resource project initiation. Partners in the project include Michigan Health Information Exchange (MiHIN); Detroit Health Department; Wayne County Health, Veterans & Community Wellness Department; Wayne State Center for Urban Studies; Data-Driven Detroit; Loveland Technologies; and Detroit East Medical Control Authority.

Wayne State University has named health equity in Detroit as one of its top priorities, supporting interdisciplinary research and programming internally and with community partners. PHOENIX promotes the collaboration of local, regional, and state stakeholders through comprehensive information sharing.