



## CATALYZING RESEARCH

Consider some of the emerging challenges we face in today's society: firearm violence, climate change, water quality. These are all complex issues, and we cannot address them strictly through the single lens of engineering, medicine or the humanities. Integration helps us foster new research and develop creative solutions to address the world's most pressing challenges.

### FIREARM INJURY PREVENTION



Firearm violence is a serious public health problem that causes about 100 deaths per day across the United States. The university launched an initiative that encourages and coordinates research across disciplines to develop new knowledge and data on firearm violence. By creating stronger infrastructure for research, educational activities and community outreach related to firearm injury prevention, U-M is better equipped to address the complexity of this public health problem by integrating the perspectives of multiple disciplines to find solutions.



As global carbon dioxide emissions continue to accelerate, a diverse set of solutions is critical to reduce, reverse and remove those emissions and prevent further atmospheric warming. The university's Global CO<sub>2</sub> initiative aims to reduce the equivalent of 10 percent of current atmospheric carbon dioxide emissions each year by 2030. That equates to roughly 4 gigatons, which could potentially be converted into concrete and other construction materials, fuels and carbon fiber for use in lightweight vehicles and fabrics.

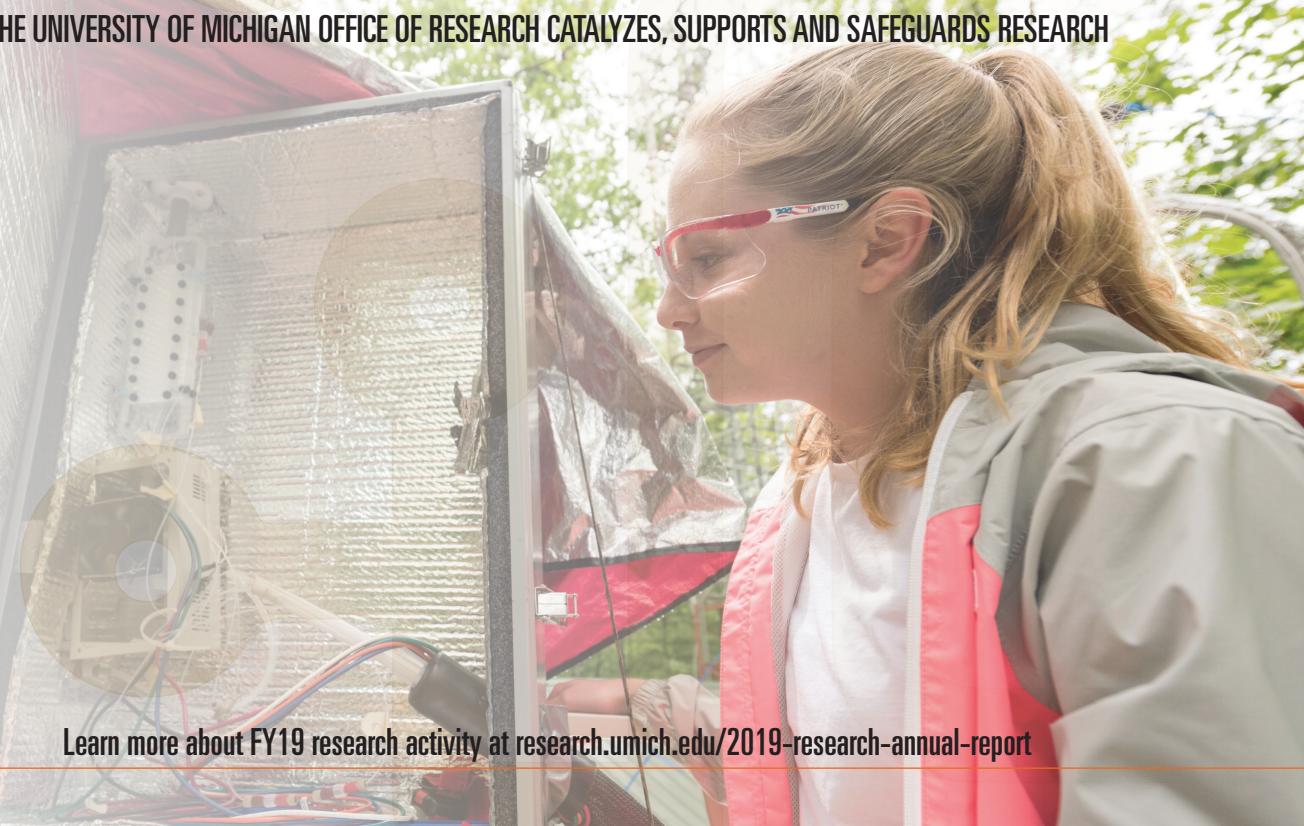


The Great Lakes comprise more than 20 percent of the world's supply of surface freshwater. And about 40 million people get their drinking water from the Great Lakes. U-M researchers in disciplines ranging from science and engineering to public policy and sustainability are partnering with communities and government agencies to address the root causes of, and potential solutions for, the most important issues impacting the Great Lakes, including harmful algal blooms, invasive species and rapid water level changes.



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THE UNIVERSITY OF MICHIGAN OFFICE OF RESEARCH CATALYZES, SUPPORTS AND SAFEGUARDS RESEARCH



Learn more about FY19 research activity at [research.umich.edu/2019-research-annual-report](https://research.umich.edu/2019-research-annual-report)



MICHIGAN RESEARCH



# RESEARCH TO SERVE THE WORLD

FY 2019 ANNUAL REPORT

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# SERVING THE WORLD THROUGH RESEARCH

How do you measure the impact of university research?

I often field this question from both internal and external partners, and as a public university, we often turn to our annual research expenditures. The University of Michigan has consistently ranked first in research volume among the nation's public universities, and during FY2019, we reported a record \$1.62 billion in research expenditures. Numbers like this are important in order to comprehend the vast amount of research led by U-M, but even more important is our collective focus on how that funding benefits society as a whole. With support from internal and external partners, our researchers help spur advancements in a variety of areas ranging from drug discovery and aging to sustainability and the arts. And it remains incredibly important that society realizes the benefits of our research and

scholarship. That means translating ideas, discoveries and technologies from the lab to the marketplace. During FY2019, our faculty and staff excelled in translating U-M research and scholarship, resulting in a record 502 inventions. U-M will continue to serve the world through research. And based on the support and expertise of individuals worldwide, the university is well prepared to meet the challenges we face in a world of rapid change, and to continue our contributions to the public good.

Sincerely,

Rebecca Cunningham  
Interim Vice President for Research

**No.1**

IN RESEARCH VOLUME AMONG U.S. PUBLIC UNIVERSITIES  
NATIONAL SCIENCE FOUNDATION

## RESEARCH IN ACTION



### Autonomous Technologies

With a \$47.8 million contract from the U.S. Army, the Automotive Research Center at U-M has shifted its focus to autonomous technologies for military ground vehicles. The center, launched in 1994, has served as a source of technology, modeling and simulation for the Army's fleet of vehicles. Autonomy has the potential to make a radical impact by significantly reducing the number of soldiers in harm's way and changing the military paradigm.

### Traumatic Brain Injuries

An estimated 2.5 million Americans sustain a traumatic brain injury, or TBI, each year, according to the Centers for Disease Control and Prevention. Severe TBI contributes to 30 percent of all injury-related deaths, and many who survive are left permanently disabled. With \$32 million in support from the National Institutes of Health, Michigan Medicine plays a leading role in an emergency department clinical trial that aims to improve outcomes for severe TBI patients.

### Demography of Aging

An estimated 5.5 million Americans, most of them 65 years or older, have dementia caused by Alzheimer's disease. With a \$10 million grant from the National Institutes of Health, U-M researchers at the Institute for Social Research's Survey Research Center aim to enhance our understanding of informal caregiving to older adults with Alzheimer's disease and related dementia through new national longitudinal data that builds upon other leading studies.

Figure 1. U-M Research Expenditures

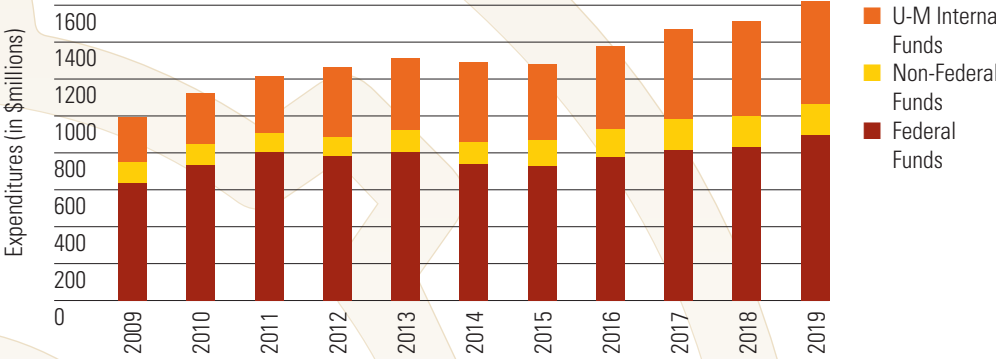


Figure 2. U-M Federal Funding by Agency

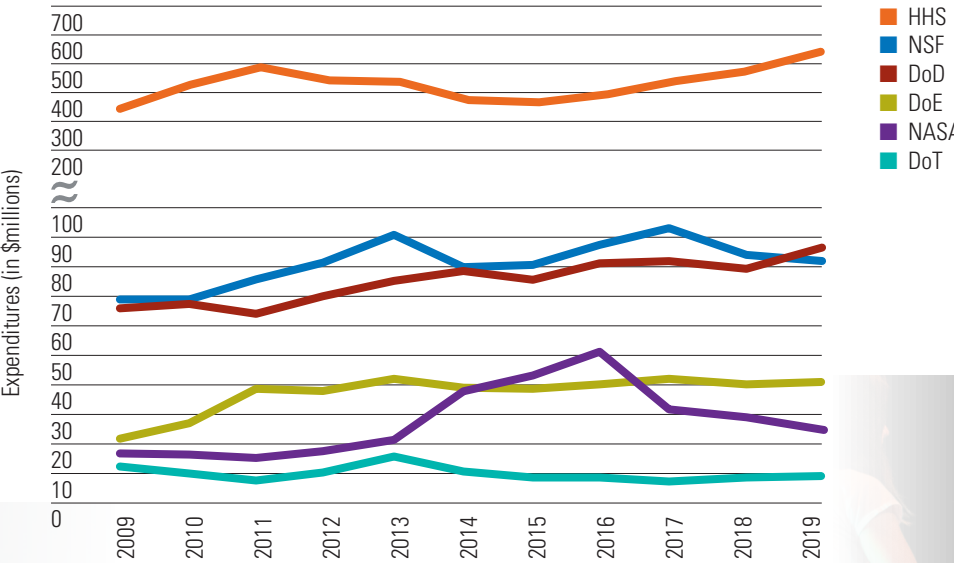


Figure 3. Research Expenditures by Unit

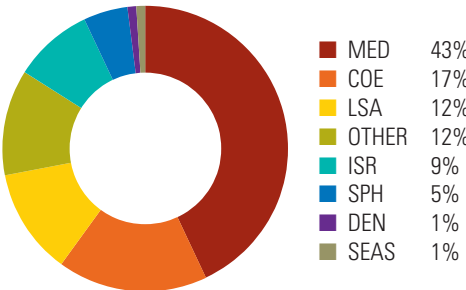


Table 1. Technology Transfer Results

	FY18	FY19
New Startups	21	22*
New Inventions	484	502*
U.S. Patents Issued	169	171
License & Option Agreements	218	232*

\*Denotes U-M Record



**~16,000**

U-M EMPLOYEES SUPPORTED  
BY RESEARCH FUNDING

**502**

NEW INVENTIONS

**\$118M**

IN INDUSTRY-SPONSORED  
RESEARCH EXPENDITURES

**22**

NEW STARTUPS

**\$888M**

IN FEDERALLY-SPONSORED  
RESEARCH EXPENDITURES

**\$1.62B**

IN RESEARCH EXPENDITURES

On the Cover: David Sherman, a U-M medicinal chemist and avid scuba diver, travels the world in search of marine microorganisms to help pioneer new antibiotics, anticancer drugs and other medicines. Photo: U-M Life Sciences Institute

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