

The University of Wisconsin-Milwaukee is one of the nation's top research universities as recognized by the Carnegie Classification of Institutions of Higher Education. In FY 2021, the university had \$44.7 million in awards. More than half of that amount – \$26.2 million – came from federal agencies. Here is a look at the 10 largest federal grants that were active last year.

### **Gravitational wave data analysis**

**Patrick Brady & Warren Anderson, physics**

**\$7.2 million over five years, National Science Foundation**

The Advanced Laser Interferometer Gravitational-wave Observatory (aLIGO) is an international partnership that first detected gravitational waves in 2015 and is now using them to learn more about the universe. This grant supports aLIGO's massive computational data analysis infrastructure.

### **Imaging biology with X-ray lasers**

**Abbas Ourmazd, Marius Schmidt and Peter Schwander, physics**

**\$4.2 million over eight years, National Science Foundation and SUNY-Buffalo**

With an eye toward finding new medical treatments, UWM scientists are using ultrashort pulses from X-ray free electron lasers to compile atomic-level movies that show proteins and viruses in action for the first time.

### **A better way to weigh**

**Michele Polfuss, nursing**

**\$3.6 million over five years, National Institutes of Health**

Children with spina bifida, a developmental disability, have higher rates of obesity than typically developing peers. Yet aspects of the disease make it difficult to obtain body measurements. This project aims to develop an accurate method of measuring body composition in a clinical setting.

### **Children, trauma and PTSD risk**

**Christine Larson, psychology**

**\$3.5 million over five years, National Institutes of Health**

This study will assess neurological and social factors among children who have experienced violence, using brain imaging and machine learning techniques. The goal is to identify predictors of post-traumatic stress disorder risk, enabling early interventions.

### **Getting more seniors to exercise**

**Scott Strath, kinesiology**

**\$2.9 million over five years, National Institutes of Health**

In this study, people with movement limitations wear sensors as they go about their usual routines, allowing researchers to develop precise models to predict and encourage physical activity. This information doesn't currently exist.

### **Alcohol's role in intimate partner violence among sexual minorities**

**Ryan Shorey, psychology**

**\$2.7 million over five years, National Institutes of Health**

The researchers are conducting the most comprehensive look at the associations between alcohol use and intimate partner violence among people who identify as lesbian, gay or bisexual – a population overlooked in this research. The goal is to improve prevention efforts.

### **The link between air pollution, autism and ADHD**

**Amy Kalkbrenner, public health**

**\$2.4 million over five years, National Institutes of Health**

The project aims to uncover whether exposure to pollutants during certain periods of pregnancy is more harmful to the developing brain than exposure in early childhood. It also looks at whether some genes can be protective or increase susceptibility to harm from pollution.

### **An app for independent living**

**Roger O. Smith, health sciences**

**\$1.5 million over three years, U.S. Department of Health and Human Services**

This project will expand the capabilities of a mobile app the researcher created to assess barriers in the home for people with disabilities. In addition to identifying needed modifications, it also will propose solutions for homeowners, their care partners, and contractors.

### **Technology that lends a hand**

**Mohammad Habib Rahman, engineering**

**\$1.5 million over three years, U.S. Department of Health and Human Services**

In this multidisciplinary project, researchers are developing a versatile robotic arm with “grippers” that can be mounted to wheelchairs to help the elderly or disabled maintain independent living and reduce the cost of caregiving.

### **Plants and animals as a climate gauge**

**Mark D. Schwartz, geography**

**\$523,202 over three years, National Science Foundation**

One of the tools used to demonstrate how much our climate is changing is phenology, the study of changes in plants and animals tied to shifts in the seasons. To improve phenological forecasting, this project will document how multiple plants respond to seasonal weather.