



## Discovering Solutions to Our Greatest Challenges

MnDRIVE is a landmark partnership between the University of Minnesota and the State of Minnesota that aligns areas of research strength with the state's key and emerging industries to address grand challenges. In 2013, the state authorized an \$18M recurring annual investment in four research areas, with a fifth area recently funded for an additional \$4M per year:

- **Robotics, Sensors, and Advanced Manufacturing** – Leveraging strengths in STEM fields to develop innovations and industries that propel the state's economy forward and fulfill workforce needs.
- **Global Food Ventures** – Partnering research, agriculture, and industry to develop sustainable solutions for securing the global food supply.
- **Advancing Industry, Conserving our Environment** – Research-based solutions to environmental challenges in support of sustainable economic growth.
- **Discoveries and Treatments for Brain Conditions** – Partnering with industry to develop new treatments for brain conditions that improve human health and quality of life.
- **Minnesota Cancer Clinical Trials Network** – Improving cancer outcomes for all Minnesotans through greater access to cancer clinical trials in prevention and treatment.

Since its inception, MnDRIVE research across the five research areas has involved more than 1,070 researchers in more than 100 departments and dozens of colleges across three campuses (Twin Cities, Duluth, and Morris).

### Highlights

- Since July 2013, MnDRIVE research has resulted in 767 hires, of which 146 of these were a direct result of the activities of our 31 new MnDRIVE faculty members.
- During calendar year 2017 alone, researchers involved in MnDRIVE work disclosed more than 70 inventions for patents or licensing and received more than \$44M in funding – 10% of which came from business and industry, including Pepsico, Xcel Energy, Medtronic, and Zoetis, Inc.
- The newly-funded MnDRIVE Minnesota Cancer Clinical Trials Network has identified 17 sites that will begin offering intervention cancer clinical trials affecting 47 counties across the state.

### Notable Successes

- **Robotics** – Drs. Nikolaos Papanikolopoulos and David Mulla led a project that licensed new UAV monitoring technologies to a local company, Sentera, with the potential to enhance the precision of nitrogen application to agricultural fields.
- **Global Food** – Dr. Abdennour Abbas' lab has created an accurate, cost effective test to detect pathogens that cause food-borne illnesses, resulting in six US patents and the potential to improve food safety in Minnesota.
- **Environment** – With local industry, new MnDRIVE faculty members Dr. Cara Santelli and Dr. Satoshi Ishii are designing bioreactors to remove manganese and sulfate from water.
- **Brain Conditions** – With a patent pending, Drs. Brian Trieu and Patrick Rothwell have developed a synergistic approach to target autism spectral disorder that combines pharmacotherapy with deep-brain stimulation.
- **Cancer Clinical Trials** – Trials beginning this year include studies on how twice-daily dosage of gingerol affects the microbiome of patients who are at a higher risk for colon cancer.

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