



## **MONTANA BOARD OF RESEARCH AND COMMERCIALIZATION TECHNOLOGY**

### **Introduction**

Since it began operations in 2000, the Montana Board of Research and Commercialization Technology (MBRCT) has played an important role in the development and support of technology-based Montana companies. This support has assisted Montana companies to complete research projects, resulting in the commercialization of products and services.

MBRCT has also supported many university-based projects. These efforts generally fall into two broad categories: 1) projects that increase the research infrastructure in the Montana University System by supporting basic research and facilitating the hire of researchers who have the ability to attract dollars and additional research expertise to their respective institutions, and 2) projects that involve the collaboration with Montana technology companies, resulting in the transfer of intellectual property that can be commercialized.

### **Objective**

The Board's objective is to award funds to research and commercialization projects with significant potential to improve the state's economy by:

- Supporting projects that have the involvement of private companies
- Supporting projects that enhance the state's research infrastructure
- Supporting projects that show a clear path to commercialization in Montana
- Providing oversight management of awarded grants

### **Funding Criteria**

- Has potential to diversify or add value to a traditional basic industry of the state's economy
- Shows promise for enhancing technology-based sectors or commercial development of discoveries
- Employs or takes advantage of existing research and commercialization strengths
- Has a realistic and achievable project design
- Employs an innovative technology
- Is located in the state
- Has a qualified research team
- Has scientific merit based on peer review
- Includes research opportunities for students
- At least 25% of total project costs are from non-state sources

## Impact of MBRCT Funds

### Report prepared by the Bureau of Business and Economic Research

In March of 2014, a report titled *The Economic Impact of the Montana Board of Research and Commercialization Technology* was released. The report was produced by the Bureau of Business and Economic Research at the University of Montana in Missoula. The report is a study of the effects on the Montana economy of the operations of the MBRCT. The results of the report are impressive. Below are sections taken from the report:

- an average of 459 jobs (per year) have been created over this 14-year period which owe their existence to the operations of MBRCT, and average earnings for these new jobs have been \$51,943 per year;
- more than \$315 million in additional income was received by Montana households, measured in inflation-corrected dollars, over this 14-year period due to MBRCT, or an average of \$22.5 million per year;
- after-tax household income of Montanans was higher by almost \$229 million over the 14-year period because of the operations of MBRCT;
- Montana-based businesses and other organizations realized \$718 million in increased gross sales, or more than \$51 million per year on average, as a result of MBRCT activities,
- and the State of Montana's tax and non-tax revenues, not including property taxes, were \$66.1 million higher in total in the 2001-2014 period due to MBRCT's impact on the economic base, with additional MBRCT-induced revenues averaging \$4.7 million during each year.

“This study finds that the operations of MBRCT have produced a larger, more prosperous and more populous state economy since 2000 than would have existed in its absence.”

“...since the sizable benefits of the scientific and technical advances for the economy these MBRCT-supported projects are not taken into account here, the economic impact estimates we present undoubtedly understate the actual contribution of MBRCT operations.”

“We find that the impact of the program's operations have been substantial, especially when compared to the relatively modest size of tax-supported MBRCT grants.”

“Our basic finding is that the agency's operations have had an outsized impact on the state economy... the economy in the years 2001-2014 has been larger, more prosperous, and more populous due to the activities of MBRCT.”

“By almost any measure, the program’s impacts have been substantial and it clearly has been a good investment in the state economy.”

### **Additional Positive Results**

- Since the inception of the program, 225 projects have been funded with a total of \$41.9 million in grants.
- \$352 million in follow-on funding has been funneled into Montana from such sources as federal agencies, educational institutions, private businesses, non-profit associations and other state governments. This has resulted in \$8.40 in follow-on funding for every dollar granted by the program.
- The program has averaged \$1.11 in matching funds for every grant dollar awarded. Matching funds total \$46.7 million.
- 56 projects have been commercialized, ranging from new wheat varieties to sensors and lasers to biofilm reactors.
- 162 of the projects have student participation, providing financial support and training in science and technology academic fields and some of these students have been hired by companies funded by the program.
- 27 start-up companies or expansions have resulted from program research projects.
- 230 scientific publications and professional presentations have resulted from program research projects.
- 152 patents have been applied for and/or received.
- 22 licensing agreements have been completed or are under negotiation.
- 89 Montana companies are program collaborators. These companies are grant recipients, have sold products resulting from program research projects or have otherwise been directly involved in program projects.

### **Commercialization Successes**

- Commercialization of Enhanced Plant Protein for Aquaculture Diets: Production Scale Up and Trout Growth Studies
- Commercialization Introduction of Barley Protein Concentrate in Aquaculture Markets
- An Integrated Platform for Cell-Based Drug Discovery
- Package and Commercialize the First of a New Generation of Live Cell Assays for Drug Discovery
- KarboLyn A Unique Homopolysaccharide Compound for Glycogen Repletion in Athletes
- MEMS-Based Micro Zoom Lens for Cell Phone Cameras
- Biological Treatment of Animal Wastes by Endophytic Fungi and “Mycofumigation”
- Commercialization of BmJ as a Broad Spectrum Microbial Plant Disease Control Agent
- Research and Commercialization of the SepticNet Nutrient Removal Technology
- Sonographic Analysis for Rapid Detection of Varroa Mites and Other Pathologies without Opening the Beehive
- Accelerated Development of Two-Gene Imidazolene-Tolerant Wheat Varieties in

## Montana

- Non-Structural Adhesives Requiring No Volatile Organic Compounds
- Value-Added Crop Development for Irrigated and Dryland Production in Eastern Montana
- Durum with Low-Cadmium Uptake for Production in Montana
- High Value Crop Research and Demonstration Project to Promote Irrigation Development in Eastern Montana
- High Performance Biobased Motor Oils from Vegetable Oil Estolides
- Accelerated Development of Solid-Stemmed Wheat Varieties
- Absolute Calibration of a CW-FM LADAR Length Metrology System
- Intelligent Proppant (iProppant)
- Innovative Fiber Optic Power Meter
- Collaborative Research Applications of Innovative Protein Fluorescence Lifetime Spectrometer
- Research Support for Standardizing a Comprehensive Biofilm Efficacy Test
- Hyperspectral Sensor for Large-Area Monitoring of Carbon-Dioxide Reservoirs and Pipelines
- Development of a Nerve Stimulation System for Clinical Use in Regional Anesthesia and Pain Management
- Development of Seed Treatment Procedure for *Carex*, *Scirpus* and *Eleocharis* Species
- Autonomous Flow-Through Instrument for CO<sub>2</sub> and pH
- Acoustic Sensor System for Protection of Borders and Perimeters of High Value Assets
- Unmanned Aerial Vehicle Deployment of Hyperspectral Imaging Spectrometers for Noxious Weed Mapping and Carbon Sequestration Site Monitoring
- Developing a High-Power, Fiber-Coupled, Electro-Optic Amplitude Modulator
- OsteoSelect Demineralized Bone Matrix Putty for Orthopedic Bone Grafting Applications
- Innovative Fluorescence Spectrometers for Life Science Research
- Immobilized Metal Polyamine Composites (IMPACS) for Removal and Recovery of Negatively Charged Species from Contaminated Waters and Mine Leaches
- S2 Material Based Frequency Stable Laser (S2-FSL) Technology Development for Coherent Optical Communications
- Second Stage Field Clinical Trials & Bringing to Market of a Natural OTC (“Kre-Celazine”) to Treat Chronic Inflammation
- Commercialization of Miniature Lasers: Evolving from Research and Development to Production
- Improving Productivity and Value of Wheat for Montana
- Development of Disposable and Reusable Acoustic Bioreactors
- Camelina Sativa: A Low-Input Oil Crop for Omega-3 Culinary Oil and Animal Feeds
- Innovative Native Seed Harvester
- Research and Development of a Hydraulic Fluid from Montana Grown Oil Seed Crops
- Biomimetic Floating Islands that Maximize Plant and Microbial Synergistic

Relationships to Revitalize Degraded Fisheries, Wildlife Habitats, and Human Water Resources

- Lasers Stabilized to Spectral Holes in Rare Earth Doped Crystals
- Research Support for the Manufacturing and Marketing of the Drip Flow Biofilm Reactor
- Deployment of A Real-Time Coal Content/Ore Grade Sensor
- Development of an Oxygen-Consuming Biological Barrier to Prevent Oxidation of Pyritic Mine Tailings
- Advanced Material for Metal Processing, Recovery and Remediation
- Development of New Products for the Field Detection of Bioterrorism Pathogens
- Research, Education and Technology Transfer in the Plant Sciences
- Specialty Mushroom Farming in Montana
- A Programmable Frequency Chirped External Cavity Diode Laser Based on KTP Waveguides
- A Real-Time Coal Content/Ore Grade Sensor
- CDC Biofilm Reactor
- Discovering Important Genes and Deploying New Feed Barley Varieties
- Indian Rice Grass: A Value Added Perennial Crop for Montana Growers
- Autonomous Carbon Dioxide Sensor
- Value-Added and High-Value Crop Development in Eastern Montana

### **Program Contact**

Dave Desch, Executive Director

Montana Board of Research & Commercialization Technology

Business