

MSU: Helping Ensure the Economy is Thriving and People Are Working

MSU, the Michigan Molecular Institute, and Neogen Corporation.

- University plant science researchers will explore **incorporation of MSU-developed gene technology in Michigan crops** — such as potatoes, melons, cucumbers, strawberries, and turfgrass — to protect them from drought and cold damage.
- MSU's interdisciplinary environmental researchers will work with representatives of Michigan's \$12.9

billion environmental industry to help **increase the state's 4.3 percent share of the national environmental services market.**

- MSU will seek corporate partners to **commercialize recent health sciences inventions**, including a novel potential treatment for hypertension, new anti-cancer therapeutics and chemotherapy adjuvants, and a patented bubonic plague vaccine for use in homeland security.

Spotlight on Success

“KTM Industries, Inc., founded in 1997, is based upon starch foam technology developed at Michigan State University. In the past seven years, KTM has applied this technology, along with subsequent research at MSU, to launch products sold into the industrial market under the *Green Cell* brand and into the consumer market under the *Magic Noodles* brand. The company currently employs 15 people in the greater Lansing area, and has generated revenues of almost \$4 million. While it is evident that KTM would not have started without MSU's technology, it is important to note that KTM's future leadership in its target markets is strongly based upon the continuing development of technology at MSU. For this reason, we view MSU as a vital strategic partner.”

—Tim Colonnese, President and CEO,
KTM Industries, Inc.

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Transforming Lives.

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Outcomes for Michigan's Future

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In Brief:

- In FY04, MSU's Federal contract and grant payroll was \$60 million — the **equivalent of more than 1,000 quality jobs** directly supported by funds brought into Michigan by **MSU research excellence**. These funds derive from the NSF, NIH, USDA, EPA, NASA, and the Departments of Education, Energy, and Defense.
- MSU's total extramurally supported research and development expenditure in FY04 was \$247 million. When the economic multiplier effect of these expenditures is considered, **the MSU research enterprise contributed more than \$1 billion to Michigan's economy.**
- According to a study of 126 medical schools by Tripp Umbach Healthcare Consulting, Inc., there was a **\$978 million impact on Michigan's economy by MSU medical schools and affiliated teaching hospitals** in FY03.
- Research creativity is a springboard for new company creation. In FY04, **MSU faculty entrepreneurs created nine new Michigan start-up ventures.**
- Creating a foundation for Michigan innovation, MSU researchers received **45 new U.S. patents** in FY04.

Situation:

In the introduction to its report, the Governor's Commission on Higher Education and Economic Growth (the "Cherry Commission") observed, "Michigan began the twentieth century as a hotbed of innovation and entrepreneurship that led to the state's domination of the industrial economy.... Today, the foundations of Michigan's economy have changed to adapt to a worldwide knowledge revolution. To thrive economically, Michigan must now adapt and innovate to contend with global — not just national — competitors."

Under its recommendation entitled "Create an Emerging Economy Initiative," the Cherry

Commission stated, "The state and federal government, universities, and private industry must boldly invest in Michigan's Technology Tri-Corridor to support the research, development, and commercialization of emerging technologies. This investment should promote Center of Excellence partnerships in the Tri-Corridor; organize and fund public/private partnerships among higher education institutions, private partners, and venture capital funds in emerging economic sectors; and focus peer-reviewed and applied research on projects with commercial potential."

MSU provides important leadership in these endeavors, which Michigan's economy needs now.

MSU Capacity:

- In December 2004, **MSU was named one of the 100 best scientific research universities in the world** in an international peer survey conducted by the *Times* Higher Education Supplement (London).
- On the basis of the impact of their scholarly publications, **19 MSU faculty have been named "Highly Cited Researchers"** by Thomson/ISI.
- Distinguished MSU researchers in plant sciences, microbiology, and chemistry have been recognized by election to membership in the **National Academy of Sciences**. Most recently, the dean of the veterinary college was elected to the **Institute of Medicine**.
- As home of the **Michigan Agricultural Experiment Station** and **MSU Extension**, the university applies research results to promote agriculture and natural resources and to address problems of social significance in every county in the state. The **MSU Product Center** for Agriculture and Natural Resources helps budding entrepreneurs and established companies through an **Innovation Counselors Network**, the provision of client services, and a **Strategic Marketing Institute**.

- MSU assistance to economic development and job creation involves **cooperation with the state's private sector**. For example, with grant support from the Michigan Technology Tri-Corridor, MSU has joined with Dow Chemical, Dow Corning, North Coast Technology Investors LP, MBI International, and the Small Business Association of Michigan in a novel alliance to promote high technology business development in Lansing and Midland.
- The university also pursues job creation and economic development in **cooperation with other state universities and government agencies**. For example, to assist members of the public in new business planning, MSU joins MEDC, the University of Michigan, and Wayne State University as co-sponsors of the Great Lakes Entrepreneurs Quest, a statewide business-planning competition for entrepreneurs.
- During FY04, **MSU faculty disclosed 152 new inventions** to the university. On the basis of prior faculty invention disclosures, **MSU filed 65 new U.S. patent applications** in FY04.

Successes:

- Federal research funding attracted to Michigan by MSU has grown from \$108 million in FY00 to \$156 million in FY04: an average **annual growth rate of 9.6 percent in Federal support**.
- MSU faculty played central roles in the **launch of nine start-up companies** during FY04:
 - AFID Therapeutics, Inc. (chiral intermediates for pharmaceuticals)
 - Biophotonic Solutions, Inc. (femtosecond laser pulse shaping)
 - Biopolymer Innovations LLC (ocular topical drug delivery)
 - C-Cure LLC (therapeutic athletic footwear)
 - Diversified Natural Products, Inc. (specialty food and chemical products)
 - GEMA LLC (optimization of human *in vitro* fertilization procedures)
 - Geopathway LLC (geographic information resources)
 - GeneCTAr.com LLC (genetic counseling)
 - Mid-Michigan Research LLC (engineering research and design)
- **Michigan companies obtained or maintained competitive advantage through new licenses** to the following MSU discoveries and inventions during FY04:
 - Anemometer technology for fluid-flow engineering
 - Anti-cancer nutraceutical
 - Anti-inflammatory nutraceutical
 - Anti-oxidants from plants
 - Blueberry varieties: "Aurora," "Draper," and "Liberty"
 - Caprolactone polymerization
 - Chiral intermediates for pharmaceuticals
 - Over-the-counter nail fungus treatment
 - Phytochemicals from various plants
 - Potato variety: "Michigan Purple"
 - Red dry bean variety: "Merlot"
 - Ultrafast laser pulse shaping for health and security applications.

Outcomes for Michigan's Future:

- Responding to state needs and consistent with the recommendations of the Governor's Commission on Higher Education and Economic Growth, Michigan State University is pursuing a number of initiatives that hold potential for truly significant impact on the state economy and public employment.
- In collaboration with state government and a broad alliance of cooperating entities, MSU seeks to secure the U.S. Department of Energy's new **Rare Isotope Accelerator ("RIA")** for the State of Michigan. Success in the national RIA site selection competition is a major institutional priority.
 - As an inaugural priority, President Lou Anna Kimsey Simon has called for the faculty to **increase MSU funding from the National Institutes of Health to \$100 million per year** over the next decade. This goal would entail **annual growth of 11.6 percent in health-related research**.
 - **MSU will seek to undergird the state's economy with research-based enhancements in the efficacy of K-12 instruction** by building on the success of its NSF-sponsored Connected Mathematics Project middle school curriculum and of outcomes analyses such as those obtained in the Third International Mathematics and Science Study (TIMSS) by College of Education investigators.
 - Through its researchers in engineering and physical sciences, MSU will work with state government and other universities to ensure that Michigan plays a central role in the country's new **National Nanotechnology Initiative (NNI)**.
 - For NNI and similar research purposes, MSU will promote **new public/private partnerships**, such as the Center for Nanostructured Biomimetic Interfaces (CNBI), a Technology Tri-Corridor funded, novel-sensors project involving researchers from