MIZZOU INNOVATES FOR THE FUTURE

University of Missouri faculty and staff generate early-stage innovations that are further developed in commercial settings for the benefit of society. See which innovators had patents, commercial agreements, startup companies and first product sales in 2021.

Gregory L. Alexander, **Professor Emeritus of Nursing**
Technology licensed by a commercial partner

- Software that uses a team-based approach to reduce hospital readmissions and improve health outcomes.

Hadi Ali-Akbarpour, **Assistant Research Professor of Electrical Engineering and Computer Science**
Startup company created with MU-licensed technologies

- Imaging company Flux Tensor Corp. licensed software that reconstructs 3D geometric models using 2D images captured from multiple camera views, stitches 2D images to create wide area views and tracks moving objects in real-world environments.

Mahmoud Almasri, **Associate Professor of Electrical Engineering and Computer Science**
Energy-harvesting device (Patent No. 11,005,352)

- This device uses cantilever beams to transform low-frequency mechanical vibrations into high-frequency vibrations that are efficiently converted into electrical power.

Microbolometer for better thermal camera performance (Patent No. 11,118,981)

- This improved sensitivity infrared thermal sensor is used in commercial and military imaging, such as surveillance (night vision goggles), threat detection, target recognition, medical diagnostics, firefighting and security.

Fabrication method for optical fiber sensors (Patent No. 10,989,867)

- This versatile, low-cost method for large-scale production of small, fiber-based sensors uses microsphere lithography to create customizable sensors that identify target materials.

Chris Barnett, Director, Center for Applied Research and Engagement Systems (CARES)

Technology licensed by a commercial partner

- Software that integrates data, mapping and visualization to help organizations and policymakers make decisions about access, equity and allocation of resources.

Eduardo Beche, Research Scientist, Plant Science and Technology

Soybean varieties licensed by commercial partners

- SA17-2742, SA17-8882, SA17-20063, SA18-268PR and SA20-1953.

Andrew Biggs, Assistant Director of Crops, Central Missouri Research, Extension and Education Center

- Soybean variety SA13-1385 licensed by a commercial partner.

Amy Williams Braddock, Associate Professor of Clinical Family and Community Medicine

Technology licensed by a commercial partner

- Decision trees incorporated in software to aid clinicians accessing medical care information in real time.

Kelli Canada, Associate Professor and Associate Director for Research, Social Work

Technology licensed by a commercial partner

- Software that uses a team-based approach to reduce hospital readmissions and improve health outcomes.

Pengyin Chen, David Haggard Endowed Professor in Soybean Breeding

Soybean varieties licensed by commercial partners

- S11-20242, S13-2734, S13-10590, S13-10592, S15-17812, S16-5540GT, S16-7922, S16-11644, S16-11651, S16-14730, S16-15170 and S16-16641GT.

Shi-Jie Chen, Curators' Distinguished Professor of Physics and Biochemistry

Technologies licensed by commercial partners

- Software package that predicts 2D structures and folding dynamics in RNA and has drug discovery applications.
- Software package that predicts 3D structures in RNA and has drug discovery applications.

Gary Francis Clark, Associate Research Professor of Obstetrics, Gynecology and Women's Health
Cancer immune-based therapy (Patent No. 10,898,563)
- This cancer vaccine uses the patient's cancer cells to generate a targeted immune response against the tumor.

Michael Wayne Clubb, Senior Research Specialist, Plant Science and Technology
Soybean varieties licensed by commercial partners
- S13-2734, S13-10590, S13-10592, S15-17812, S16-16641GT, S16-5540GT, S16-7922, S16-11644, S16-14730, S16-15170 and S16-11651.

Joan R. Coates, Professor of Veterinary Medicine Neurology and Neurosurgery
Technology licensed by a commercial partner
- Small animal kennel that promotes natural eating and drinking behaviors during real-time medical imaging of swallowing function to diagnose dysphagia.

Jared S. Coberly, Adjunct Assistant Professor of Clinical Pathology
Technology licensed by a commercial partner
- A web-based treatment algorithm linked to a patient's electronic medical record to improve clinical decision support.

Christine Cole, Senior Research Associate, Plant Science and Technology
- Soybean variety SA20-1953 licensed by a commercial partner.

James L. Cook, Director of Thompson Laboratory for Regenerative Orthopaedics; William C. and Kathryn E. Allen Distinguished Chair in Orthopaedic Surgery
Tissue preservation system (Patent No. 10,881,098)
- Bone and cartilage from organ donors can be preserved for longer at room temperature, allowing more time to match donors to recipients.

Allografting device and techniques (Patent No. 10,905,437)
- This tissue-cutting guide offers surgeons a superior way to remove damaged tissue from a patient's knee joint and form a recipient site for transplanting of a donor graft.

Melissa Crisel, Senior Research Associate, Plant Science and Technology
Soybean varieties licensed by commercial partners
- S11-20242, S13-2734, S13-10590, S13-10592, S15-17812, S16-5540GT, S16-7922, S16-11644, S16-11651, S16-14730 and S16-16641GT.

Nikole Cronk, Associate Teaching Professor of Clinical Psychology
Technology licensed by a commercial partner
- Decision trees incorporated in software to aid clinicians accessing medical care information in real time.

Joshua Dakota, Research Specialist, Plant Science and Technology
Soybean varieties licensed by commercial partners
- SA13-1310, SA13-1363, SA13-2699, SA14-9653, SA17-2742, SA17-8882, SA17-20063, SA18-268PR and SA20-1953.

Michael J. Davis, Curators' Distinguished Professor of Medical Pharmacology and Physiology; Margaret Proctor Mulligan Professor in Medical Research
Topical and transdermal treatment for lymphedema (Patent No. 10,918,629)
- This compound activates the pumping function of the lymphatic vessels, reducing lymphatic fluids.

Kristen Deane, Associate Professor of Clinical Family and Community Medicine
Technology licensed by a commercial partner
- Decision trees incorporated in software to aid clinicians accessing medical care information in real time.

Bishnu P. Dhital, Research Specialist, Plant Science and Technology
Soybean varieties licensed by a commercial partner
- SA17-20063, SA18-268PR and SA20-1953.

Dongsheng Duan, Curators' Distinguished Professor of Molecular Microbiology and Immunology; Margaret Proctor Mulligan Professor in Medical Research
Gene therapy for muscular dystrophies (Patent No. 11,202,840)
- These engineered mini- and micro-dystrophin genes can restore function to skeletal and cardiac muscles in patients with muscular dystrophies.

Technologies licensed and optioned by commercial partners
- Improved gene therapy constructs to enable treatment of diseases associated with longer genes.
- Improved constructs to reduce adverse immune responses in gene therapy.

Filiz Bunyak Ersoy, Assistant Research Professor of Electrical Engineering and Computer Science
Software system to assess speech and swallowing (Patent No. 10,959,661)
- Clinicians can use this software to measure the level of dysfunction objectively and quantitatively in patients with speech and swallowing disorders, enabling earlier diagnosis, disease progression tracking and comparison to control groups.

Technologies licensed by a commercial partner

- A moving-object detection system that can tell the difference between an object of interest and its shadow.
- A moving-object recognition system that tracks objects with high accuracy and predicts future motion.

Zaichun (Frank) Feng, Professor of Mechanical and Aerospace Engineering

Thermoelectric dehumidifier (Patent No. 11,209,176)

- This dehumidifier is more efficient and quieter than compressor-based systems and currently available thermoelectric cooler-based dehumidifiers.

Christopher Fulcher, Assistant Research Professor of Public Affairs

Technology licensed by a commercial partner

- Software that integrates data, mapping and visualization to help organizations and policymakers make decisions about access, equity and allocation of resources.

Kevin Frazer, Associate Professor of Clinical Family and Community Medicine

Technology licensed by a commercial partner

- Decision trees incorporated in software to aid clinicians accessing medical care information in real time.

Fabio Gallazzi, Associate Research Professor of Chemistry

Technology licensed by a commercial partner

- A biological treatment for HIV that prevents the virus from replicating.

Kent S. Gates, Associate Chair and Professor of Chemistry

More accurate way to capture individual genetic markers (Patent No. 11,034,996)

- This method enables improved detection of small differences in a person's genes, which helps predict the risk of developing diseases and response to drugs.

Technologies licensed by a commercial partner

- Nucleic acid platforms that use nanopores to detect genetic diseases.

David Alan Grant, Executive Director, BARDA DRIVe Midwest Bioaccelerator

Injectable bionanomaterial to treat osteoarthritis (Patent No. 11,160,906)

- This composite material reduces cartilage degeneration after joint or spinal cord injury to prevent or treat osteoarthritis.

Sheila Grant, Associate Vice Chancellor, MU Research and Strategic Initiatives; Professor of Biological and Biomedical Engineering
Injectable bionanomaterial to treat osteoarthritis (Patent No. 11,160,906)
- This composite material reduces cartilage degeneration after joint or spinal cord injury to prevent or treat osteoarthritis.

Li-Qun (Andrew) Gu, Professor of Biological and Biomedical Engineering
More accurate way to capture individual genetic markers (Patent No. 11,034,996)
- This method enables improved detection of small differences in a person's genes, which helps predict the risk of developing diseases and response to drugs.

Technologies licensed by a commercial partner
- Nucleic acid platforms that use nanopores to detect genetic diseases.

Xu Guo, Doctoral Student, Chemistry
Technology licensed by a commercial partner
- Nucleic acid platform that uses nanopores to detect genetic diseases.

Xu Han, Assistant Research Professor in Medicine
Technology licensed by a commercial partner
- Improved cryopreservation device that preserves biological materials without cryopreservatives.

Christy Hutton, Director, MU Wellness Resource Center
Technology licensed by commercial partners
- A presentation that teaches educators how to recognize signs of mental distress in students.

Shibu Jose, Associate Dean of Research and Professor, College of Agriculture, Food and Natural Resources
Technologies optioned by a commercial partner
- A multi-enzyme system for production of specialty chemicals, biofuels and blood type conversion.
- A computer-implemented 3D printing method for making enzyme-immobilized platforms for blood type conversion.

Raghuraman Kannan, Michael J. and Sharon R. Bukstein Chair in Cancer Research; Professor of Radiology and Biological Engineering
Composite nanomaterials and synthesis methods (Patent No. 10,914,734)
- These targeted gold nanoparticles deliver cancer therapeutics more precisely.

Kattesh V. Katti, Curators' Distinguished Professor of Radiology and Physics; Margaret Proctor Mulligan Professor in Medical Research
Technologies licensed and optioned by commercial partners

- Silver nanoparticle-based antivirals, antifungals and antibacterials produced using green methods.
- Gold nanoparticle-based anti-cancer therapeutics produced using green methods.
- Multi-enzyme system for production of specialty chemicals, biofuels and blood type conversion.

Kavita K. Katti, Senior Research Chemist, Radiology
Technologies licensed by a commercial partner

- Silver nanoparticle-based antivirals, antifungals and antibacterials produced using green methods.
- Gold nanoparticle-based anti-cancer therapeutics produced using green methods.

James M. Keller, Curators' Distinguished Professor Emeritus of Electrical Engineering and Computer Science
Integrated sensor network to monitor activity patterns (Patent No. 11,147,451)

- A network of different types of sensors noninvasively detects an older adult's activity level at home and informs clinicians and families when pattern changes indicate physical or cognitive health issues.

Sharon Kist, Clinical Nursing Instructor
Startup company created with an MU-licensed technology

- NewPath Health Solutions LLC, which had its first sales in 2021, offers services to improve eldercare facilities. The company licensed software that uses a team-based approach to reduce hospital readmissions and improve health outcomes.

Allison Kolker, Assistant Professor of Clinical Family and Community Medicine
Technology licensed by a commercial partner

- Decision trees incorporated in software to aid clinicians accessing medical care information in real time.

Mili Kuruvilla-Dugdale, Associate Professor of Speech, Language and Hearing Sciences
Software system to assess speech and swallowing (Patent No. 10,959,661)

- Clinicians can use this software to measure the level of dysfunction objectively and quantitatively in patients with speech and swallowing disorders, enabling earlier diagnosis, disease progression tracking and comparison to control groups.

Jae Wan Kwon, Professor of Electrical Engineering and Computer Science
Radiolytic electrochemical generator (Patent No. 10,938,045)

- Similar to how a battery converts chemical energy to electrical energy, this new device converts radiation energy to electrical energy.

Technology licensed by a commercial partner

- Self-charging nuclear battery.

Teresa E. Lever, Associate Professor of Otolaryngology
Software system to assess speech and swallowing (Patent No. 10,959,661)

- Clinicians can use this software to measure the level of dysfunction objectively and quantitatively in patients with speech and swallowing disorders, enabling earlier diagnosis, disease progression tracking and comparison to control groups.

Startup company created with an MU-licensed technology

- Lever Scientific LLC offers medical and veterinary diagnostic services focused on swallowing and neurological disorders in humans and animals. The company licensed a small animal kennel that promotes natural eating and drinking behaviors during real-time medical imaging of swallowing function to diagnose dysphagia.

Jun Li, Postdoctoral Fellow, Physics
Technology licensed by a commercial partner

- Software package that predicts 3D structures in RNA and has drug discovery applications.

Chung-Ho Lin, Research Associate Professor of Forestry
Technologies optioned by a commercial partner

- A multi-enzyme system for production of specialty chemicals, biofuels and blood type conversion.
- A computer-implemented 3D printing method for making enzyme-immobilized platforms for blood type conversion.

Chris L. Lorson, Associate Vice Chancellor for Research; Curators' Distinguished Professor of Molecular Microbiology, Immunology and Veterinary Pathobiology
Gene therapy for spinal muscular atrophy (Patent No. 11,136,580)

- This treatment enables the production of the survival motor neuron protein, which is deficient in infants with spinal muscular atrophy, an often fatal neuromuscular disease.

Hongbin (Bill) Ma, Chair and Glen A. Barton Professor of Mechanical and Aerospace Engineering

Heat-exchanging thermal liquid container (Patent No. 11,142,675)

- This container quickly cools coffee and other hot beverages to a drinkable temperature and maintains that temperature for an extended period.

Thermoelectric dehumidifier (Patent No. 11,209,176)

- This dehumidifier is more efficient and quieter than compressor-based systems and currently available thermoelectric cooler-based dehumidifiers.

Technologies licensed by a commercial partner

- Thermally driven heat pump that provides efficient refrigeration and hot water in one system.
- Efficient heat-exchange systems for cooling electronics.
- A mug that quickly cools hot beverages to the ideal drinking temperature.
- Drinking container that cools and maintains a beverage at a drinkable temperature.
- Improved lids for closing drinkware and containing heat.

Hsin-Yeh Hsieh, Research Assistant Professor of Natural Resources

Technologies optioned by a commercial partner

- A multi-enzyme system for production of specialty chemicals, biofuels and blood type conversion.
- A computer-implemented 3D printing method for making enzyme-immobilized platforms for blood type conversion.

Leonard H. Manson, Director of Lab Operations, MU Research Reactor

Technology licensed by a commercial partner

- A process for producing a high-purity radiopharmaceutical.

Clinton Meinhardt, Senior Research Specialist, Plant Science and Technology

Soybean varieties licensed by commercial partners

- SA13-1310, SA13-1363, SA13-2699, SA14-9653, SA17-2742, SA17-8882, SA17-20063, SA18-268PR and SA20-1953.

Wesley Moore, Senior Research Specialist, Plant Science and Technology

Soybean varieties licensed by commercial partners

- SA17-2742, SA17-8882, SA17-20063, SA18-268PR and SA20-1953.

Laura Morris, Associate Professor of Clinical Family and Community Medicine

Technology licensed by a commercial partner

- Decision trees incorporated in software to aid clinicians accessing medical care information in real time.

Jessica Mueller, Senior Program/Project Support Coordinator, Nursing
Startup company created with an MU-licensed technology

- NewPath Health Solutions LLC, which had its first sales in 2021, offers services to improve eldercare facilities. The company licensed software that uses a team-based approach to reduce hospital readmissions and improve health outcomes.

Cuong X. Nguyen, Postdoctoral Research Associate, Plant Science and Technology
Technologies optioned by a commercial partner

- Method for increasing amino acid and protein contents in plants.
- Gene that increases seed weight in soybeans, resulting in greater yield.

Henry Thien Nguyen, Curators' Distinguished Professor of Plant Science and Technology

- Soybean variety S11-20242 licensed by a commercial partner.

Xiaofan Niu, Associate Director Program/Projects, Health Management and Informatics
Soybean varieties licensed by commercial partners

- SA13-1310, SA13-1363, SA13-1385, SA13-2699 and SA14-9653.

Kannappan Palaniappan, Professor of Electrical Engineering and Computer Science
Startup company created with MU-licensed technologies

- Imaging company Flux Tensor Corp. licensed software that reconstructs 3D geometric models using 2D images captured from multiple camera views, stitches 2D images to create wide area views and tracks moving objects in real-world environments.

Xiufang Pan, Research Scientist, Molecular Microbiology and Immunology
Technologies licensed and optioned by commercial partners

- Improved constructs to reduce adverse immune responses in gene therapy.

Nickie J. Peters, Research Specialist, MU Research Reactor
Technology optioned by a commercial partner

- New control rods for nuclear reactors that last longer and are more cost-effective.

Robert Pierce, Associate Professor of Clinical Family and Community Medicine
Technology licensed by a commercial partner

- Decision trees incorporated in software to aid clinicians accessing medical care information in real time.

Lori Popejoy, Associate Dean for Innovation and Partnerships; Associate Professor of Nursing

Startup company created with MU-licensed technology

- NewPath Health Solutions LLC, which had its first sales in 2021, offers services to improve eldercare facilities. The company licensed software that uses a team-based approach to reduce hospital readmissions and improve health outcomes.

Mihail Popescu, Professor of Health Management and Informatics

Integrated sensor network to monitor activity patterns (Patent No. 11,147,451)

- A network of different types of sensors noninvasively detects an older adult's activity level at home and informs clinicians and families when pattern changes indicate physical or cognitive health issues.

Randall S. Prather, Curators' Distinguished Professor of Animal Sciences

Genetically modified swine resistant to the porcine reproductive and respiratory syndrome virus, or PRRS (Patent No. 11,019,809 and Patent No. 11,160,260)

- This trait makes pigs resistant to the PRRS virus, which causes widespread death in herds.

Technology licensed by a commercial partner

- A biological culture media additive for livestock artificial insemination and cloning that yields larger litter sizes.

Elizabeth Prenger, Senior Research Specialist, Natural Resources

Soybean varieties licensed by commercial partners

- SA17-2742, SA17-8882, SA18-268PR, SA20-1953 and SA17-20063.

Thomas P. Quinn, Professor of Biochemistry

Technology licensed by a commercial partner

- A biological treatment for HIV that prevents the virus from replicating.

Marilyn Rantz, Curators' Distinguished Professor Emerita of Nursing

Integrated sensor network to monitor activity patterns (Patent No. 11,147,451)

- A network of different types of sensors noninvasively detects an older adult's activity level at home and informs clinicians and families when pattern changes indicate physical or cognitive health issues.

Startup company created with MU-licensed technology

- NewPath Health Solutions LLC, which had its first sales in 2021, offers services to improve eldercare facilities. The company licensed software that uses a team-based approach to reduce hospital readmissions and improve health outcomes.

R. Michael Roberts, Chancellor's Professor Emeritus of Animal Sciences and Biochemistry

Scalable meat production using animal cell cultures (Patent No. 10,920,196)

- This technology enables the production of meat by growing animal-based muscle cells in a laboratory setting.

Technology licensed by a commercial partner

- A biological culture media additive for livestock artificial insemination and cloning that yields larger litter sizes.

Andrew Scaboo, Assistant Professor of Plant Science and Technology

Soybean varieties licensed by commercial partners

- SA13-1310, SA13-1363, SA13-1385, SA13-2699, SA14-9653, SA17-2742, SA17-8882, SA17-20063, SA18-268PR and SA20-1953.

James Grover Shannon, Professor Emeritus of Plant Science and Technology

Soybean varieties licensed by commercial partners

- S11-20242, S13-2734, S13-10590, S13-10592, S15-17812, S16-5540GT, S16-7922, S16-11644, S16-11651, S16-14730, S16-15170 and S16-16641GT.

Chi-Ren Shyu, Paul K. and Dianne Shumaker Professor of Electrical Engineering and Computer Science

An efficient, top-down approach to big data mining (Patent No. 11,055,351)

- This new software structure for complex data, such as electronic medical records, takes up less computer memory and greatly reduces runtime compared to other available mining and analytics tools.

Kamlendra Singh, Associate Research Professor of Veterinary Pathobiology

Technology licensed by a commercial partner

- A biological treatment for HIV that prevents the virus from replicating.

Marjorie Skubic, Curators' Distinguished Professor of Electrical Engineering and Computer Science; Robert H. Buescher Faculty Fellow

Integrated sensor network to monitor activity patterns (Patent No. 11,147,451)

- A network of different types of sensors noninvasively detects an older adult's activity level at home and informs clinicians and families when pattern changes indicate physical or cognitive health issues.

Hydraulic bed sensor system to monitor physiological data (Patent No. 11,013,415)

- This noninvasive bed sensing system detects and monitors a person's physiological movements, such as pulse and respiration rates, to detect early signs of illness and functional decline.

Charles J. Smith, Professor of Radiology
Dual-targeting compound for prostate cancer diagnosis and treatment (Patent No. 11,167,048)

- This compound offers clinicians the ability to detect and treat prostate cancer earlier and more accurately by binding simultaneously to two biomarkers instead of one.

Scotty Lee Smothers, Senior Research Associate of Plant Science and Technology
Soybean varieties licensed by commercial partners

- S11-20242, S13-2734, S13-10590, S13-10592, S15-17812, S16-5540GT, S16-7922, S16-11644, S16-11651, S16-14730, S16-15170 and S16-16641GT.

Lee Spate, Senior Research Specialist, Animal Sciences
Technology licensed by a commercial partner

- A biological culture media additive for livestock artificial insemination and cloning that yields larger litter sizes.

Gary Stacey, Curators' Distinguished Professor of Biochemistry, Plant Science and Technology
Technologies optioned by a commercial partner

- Gene that increases seed weight in soybeans, resulting in greater yield.

Minviluz (Bing) Stacey, Assistant Research Professor of Plant Science and Technology
Technologies optioned by a commercial partner

- Method for increasing amino acid and protein contents in plants.
- Gene that increases seed weight in soybeans, resulting in greater yield.

James P. Stannard, Hansjorg Wyss Distinguished Chair in Orthopaedic Surgery; Medical Director of the Missouri Orthopaedic Institute
Allografting device and techniques (Patent No. 10,905,437)

- This tissue-cutting guide offers surgeons a superior way to remove damaged tissue from a patient's knee joint and form a recipient site for transplanting of a donor graft.

James Stevermer, Professor of Clinical Family and Community Medicine
Technology licensed by a commercial partner

- Decision trees incorporated in software to aid clinicians accessing medical care information in real time.

George C. Stewart, Professor Emeritus of Veterinary Pathobiology
Technologies optioned by a commercial partner
- A multi-enzyme system for production of specialty chemicals, biofuels and blood type conversion.
- A computer-implemented 3D printing method for making enzyme-immobilized platforms for blood type conversion.

Aaron M. Stoker, Associate Director of the Thompson Laboratory for Regenerative Orthopaedics; Research Professor in Orthopaedic Surgery
Tissue preservation system (Patent No. 10,881,098)
- Bone and cartilage from organ donors can be preserved for longer at room temperature, allowing more time to match donors to recipients.

Bhanu Prakash Telugu, Associate Professor of Animal Sciences
Scalable meat production using animal cell cultures (Patent No. 10,920,196)
- This technology enables the production of meat by growing animal-based muscle cells in a laboratory setting.

Jay J. Thelen, Professor of Biochemistry
Increasing plant oil content for food and energy (Patent No. 10,883,113)
- This trait increases the overall seed oil content in crops.

Kai Tian, Postdoctoral Fellow, Surgery
Technology licensed by a commercial partner
- Nucleic acid platform that uses nanopores to detect genetic diseases.

Anandhi Upendran, Director of Biomedical Innovation, School of Medicine
Composite nanomaterials and synthesis methods (Patent No. 10,914,734)
- These targeted gold nanoparticles deliver cancer therapeutics more precisely.

Mariola Usovsky, Senior Research Associate, Plant Science and Technology
Soybean varieties licensed by commercial partners
- SA17-2742, SA17-8882, SA18-268PR, SA20-1953 and SA17-20063.

Amy Vogelsmeier, Associate Professor of Nursing
Startup company created with an MU-licensed technology
- NewPath Health Solutions LLC, which had its first sales in 2021, offers services to improve eldercare facilities. The company licensed software that uses a team-based approach to reduce hospital readmissions and improve health outcomes.

Kevin D. Wells, Associate Professor of Animal Sciences
Genetically modified swine resistant to the porcine reproductive and respiratory syndrome virus, or PRRS (Patent No. 11,019,809 and Patent No. 11,160,260)

- This trait makes pigs resistant to the PRRS virus, which causes widespread death in herds.

Henry W. White, Professor Emeritus of Physics and Astronomy
Technology licensed by a commercial partner

- Improved cryopreservation device that preserves biological materials without cryopreservatives.

Kristin M. Whitworth, Associate Director of Research Activities, National Swine Reproductive and Research Center
Genetically modified swine resistant to the porcine reproductive and respiratory syndrome virus, or PRRS (Patent No. 11,019,809 and Patent No. 11,160,260)

- This trait makes pigs resistant to the PRRS virus, which causes widespread death in herds.

Stacy L. Wilder, Research Lab Supervisor, MU Research Reactor
Technology licensed by a commercial partner

- A process for producing a high-purity radiopharmaceutical.

Elena V. Wright, Database Developer and Administrator, University of Missouri System
Integrated sensor network to monitor activity patterns (Patent No. 11,147,451)

- A network of different types of sensors noninvasively detects an older adult's activity level at home and informs clinicians and families when pattern changes indicate physical or cognitive health issues.

Yangchuan (Chad) Xing, Cramer W. LaPierre Professor of Chemical Engineering
Startup company created with an MU-licensed technology

- Simple Process Technologies licensed an efficient process for producing raw materials needed for lithium batteries.

Xiaojun Xu, Visiting Scholar, Physics
Technologies licensed by commercial partners

- Software package that predicts 2D structures and folding dynamics in RNA and has drug discovery applications.
- Software package that predicts 3D structures in RNA and has drug discovery applications.

Ming Yang, Postdoctoral Fellow, Surgery
Customizable antimicrobial therapeutics (Patent No. 11,116,817)
- ✱ These broad-spectrum antimicrobials, an alternative to antibiotics, prevent infection, preserve food and create a stronger immune response when added to vaccines.

Yongping Yue, Research Specialist Lead, Molecular Microbiology and Immunology
Gene therapy for muscular dystrophies (Patent No. 11,202,840)
- ✱ These engineered mini- and micro-dystrophin genes can restore function to skeletal and cardiac muscles in patients with muscular dystrophies.

Technologies licensed and optioned by commercial partners
- ✱ Improved gene therapy constructs to enable treatment of diseases associated with longer genes.
- ✱ Improved constructs to reduce adverse immune responses in gene therapy.

Habib Zaghouani, J. Lavenia Edwards Chair in Pediatrics; Professor of Molecular Microbiology and Immunology
Technology licensed by a commercial partner
- ✱ Monoclonal antibody against mouse interleukin 13 receptor alpha 1, used to research its role in Type 1 diabetes.

First sales of a product that uses MU technology
- ✱ Monoclonal antibody against mouse interleukin 13 receptor alpha 1, used to research its role in Type 1 diabetes.

Shuping Zhang, Professor of Veterinary Medicine
Customizable antimicrobial therapeutics (Patent No. 11,116,817)
- ✱ These broad-spectrum antimicrobials, an alternative to antibiotics, prevent infection, preserve food and create a stronger immune response when added to vaccines.

Sicheng Zhang, Doctoral Student, Physics
Technologies licensed by commercial partners
- ✱ Software package that predicts 2D structures and folding dynamics in RNA and has drug discovery applications.

Yunxin Zhao, Professor of Electrical Engineering and Computer Science
Software system to assess speech and swallowing (Patent No. 10,959,661)
- ✱ Clinicians can use this software to measure the level of dysfunction objectively and quantitatively in patients with speech and swallowing disorders, enabling earlier diagnosis, disease progression tracking and comparison to control groups.