



ACCELERATING MIZZOU INNOVATION AND CREATIVITY

University of Missouri researchers generate innovations that are further developed in commercial settings for the benefit of society. See who had patents, commercial agreements, startup companies and first product sales in 2022.

A

Yan Adu-Gyamfi, Assistant Professor of Civil and Environmental Engineering

- *Technology licensed by a commercial partner:* Machine vision software that assesses pavement damage and provides training data
- *Startup company created with MU-licensed technologies:* Tiger Eye Engineering uses advanced machine learning, data analytics and data visualization to evaluate and monitor pavement conditions.

Mahmoud Almasri, Associate Professor of Electrical Engineering and Computer Science

- *Patent No. 11,422,134: High-sensitivity impedance sensor*
This biosensor array enables rapid detection and quantification of bacteria and other analytes at low concentrations to detect toxins, prevent food-borne diseases and more.

Nathan Andrzejewski, Senior, Journalism

- *Technology licensed by a commercial partner:* Promotional video about patient care at MU

Matthew Ashby, Senior Research Specialist, Plant Science and Technology

- *Soybean varieties licensed by commercial partners:* SA19-10016, SA19-10777, SA19-28698, SA19-8221, SA19-9788, SA19-9915, SA18-10815, SA18-11346, SA18-12086, SA18-14143, SA19-10248, SA19-10772, SA19-12580, SA18-12111, SA18-14099, SA18-14232, SA18-15071, SA18-6603, SA18-7258, SA18-7406, SA18-7490, SA18-9109, SA18-11280, SA19-24408HOLL, SA19-12541, SA19-311H-HOLL and SA19-28597

B

Yan Barnett, Senior Research Consultant, MU Extension

- *Technology licensed by a commercial partner:* Mobile app for grass height measurements in a pasture environment

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

- *Soybean variety licensed by a commercial partner:* SA13-1385

John Douglas Brockman, Associate Professor of Chemistry

- *Patent No. 11,515,161: Low-defect nuclear transmutation doping in nitride-based semiconductor materials*

This nuclear radiation-induced isotope changes in gallium nitride to produce large-bandgap semiconductors for LEDs, lasers and radar.

Filiz Bunyak, Assistant Professor of Electrical Engineering and Computer Science

- *Technology optioned by a commercial partner: Software for assessing oral motor skills in humans*

Donald H. Burke-Agüero, Professor of Molecular Microbiology, Immunology and Biochemistry

- *Patent No. 11,286,489: POSH inhibitor complex biomolecules and amphiphile micelles*

This therapeutic and delivery system targets a cell-signaling pathway to treat leukemia, breast cancer and other conditions.

William G. Buttlar, Glen Barton Chair in Flexible Pavement Technology; Professor of Civil and Environmental Engineering

- *Technology licensed by a commercial partner: Machine vision software that assesses pavement damage and provides training data*
- *Startup company created with MU-licensed technologies: Tiger Eye Engineering uses advanced machine learning, data analytics and data visualization to evaluate and monitor pavement conditions.*

C

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

- *Technology licensed by a commercial partner: Software for predicting on- and off-target CRISPR efficiencies using a physics-based approach*

Michael Wayne Clubb, Research Specialist Lead, Plant Science and Technology

- *Soybean varieties licensed or optioned by commercial partners: S12-4718, S13-10590, S13-10592, S13-1955, S15-10434, S15-17812HOL, S16-5503GT, S16-5540GT, S16-7922, S16-8290, S16-9090, S16-14730, S16-14801, S16-15170, S17-1980, S17-2193, S17-2243, S17-17168, S18PR-190HOLL and S19-19741GT-HOLL*
- *First sales of products that use MU technology: Soybean varieties S16-5540GT, S16-11644C, S16-7922, S16-15170C, S16-11651C and S15-17812*

Joan R. Coates, Professor of Veterinary Medicine Neurology and Neurosurgery

- *Technology licensed by a commercial partner: DNA test for canine degenerative myelopathy*
- *First sales of a product that uses MU technology: FluoroKennel, a videofluoroscopic imaging system for companion animals to diagnose and track swallowing disorders*
- *First sales of a product that uses MU technology: Animaline, a canine degenerative myelopathy diagnostic test for dogs that detects changes in the animal's superoxide dismutase 1 gene*

James L. Cook, William C. and Kathryn E. Allen Distinguished Chair in Orthopaedic Surgery

- *Patent No. 11,241,353: Knee flexion device*
A quantitative patient-controlled physical therapy device that can be used to treat pre- or post-surgery knee stiffness.
- *Patent No. 11,503,823: Tissue preservation system*
This system more than doubles the storage time and increases the viability of orthopaedic grafts and tissues used in transplants.

Cory Crecelius, Physical Therapist, Mizzou BioJoint Center

- *Patent No. 11,241,353: Knee flexion device*
A quantitative patient-controlled physical therapy device that can be used to treat pre- or post-surgery knee stiffness.

Melissa Crisel, Senior Research Associate, Plant Science and Technology

- *Soybean varieties licensed or optioned by commercial partners:* S08-14788, S09-13185, S09-13608, S12-4718, S13-10590, S13-10592, S13-3851, S14-15138GT, S13-1955, S15-10434, S15-17812HOL, S16-5540GT, S16-7922, S16-14730, S16-14801, S16-5503GT, S16-8290, S16-9090, S17-2193, S17-2243, S17-17168, S17-1980, S18PR-190HOLL and S19-19741GT-HOLL
- *Startup company created with MU-licensed technologies:* T-Agros is an agricultural company focused on soybeans.
- *First sales of products that use MU technology:* Soybean varieties S16-5540GT, S16-11644C, S16-7922, S16-15170C, S16-11651C, S08-14788 and S15-17812

D

Charlie Dake, Senior, Business

- *Technology licensed by a commercial partner:* Promotional video about patient care at MU

Mark Daniels, Associate Professor of Molecular Microbiology, Immunology and Surgery

- *Patent No. 11,286,489: POSH inhibitor complex biomolecules and amphiphile micelles*
This therapeutic and delivery system targets a cell-signaling pathway to treat leukemia, breast cancer and other conditions.

Bishnu P. Dhital, Research Specialist, Plant Science and Technology

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Dongsheng Duan, Curators' Distinguished Professor of Molecular Microbiology and Immunology; Margaret Proctor Mulligan Professor in Medical Research

- *Technology licensed by a commercial partner:* Software for predicting on- and off-target CRISPR efficiencies using a physics-based approach
- *Patent No. 11,287,623: Optical polarization tractography systems*
High-resolution 3D imaging visualizes early tissue fiber abnormalities at the cellular level to diagnose signs of heart attack and other pathologies.

E

Dan England, Senior Research Specialist, Plant Science and Technology

- *Technology licensed by a commercial partner:* Mobile app for grass height measurements in pasture environments.

G

John Michel Gahl, Professor of Electrical Engineering and Computer Science

- *Patent No. 11,515,161: Low-defect nuclear transmutation doping in nitride-based semiconductor materials*
This nuclear radiation-induced isotope changes in gallium nitride to produce large-bandgap semiconductors for LEDs, lasers and radar.

Diana Gil Pagés, Associate Professor of Molecular Microbiology, Immunology, Surgery and Bioengineering

- *Patent No. 11,426,462: Monovalent anti-CD3 adjuvants*
This antibody fragment can be used to amplify a patient's immune response to cancer and pathogens.

Kevin Gillis, Professor and Chair of Chemical and Biomedical Engineering

- *Technology licensed by a commercial partner:* Fluorescent sensors to detect neurotransmitters in cells

Timothy E. Glass, Associate Dean for Research, College of Arts and Science; Professor of Chemistry

- *Technology licensed by a commercial partner:* Fluorescent sensors to detect neurotransmitters in cells

Nathan Gregg, Senior, Journalism

- *Technology licensed by a commercial partner*: Promotional video about patient care at MU

Trent M. Guess, Associate Professor of Physical Therapy; Director, Mizzou Motion Analysis Center

- *Patent No. 11,241,353: Knee flexion device*
A quantitative patient-controlled physical therapy device that can be used to treat pre- or post-surgery knee stiffness.

H

Stacey Hamilton, Instructor, Animal Sciences Research Center

- *Technology licensed by a commercial partner*: Mobile app for grass height measurements in pasture environments.

Christy Hutton, Assistant Teaching Professor and Director of Clinical Training, Educational, School and Counseling Psychology

- *Technology licensed by commercial partners*: Mental health first responder presentation

J

Yuexu Jiang, Postdoctoral Fellow, Computer Science

- *Technology licensed by a commercial partner*: Software to predict protein localization

Lei Jin, Postdoctoral Fellow, Physics

- *Technology licensed by a commercial partner*: Software for predicting on- and off-target CRISPR efficiencies using a physics-based approach

Gary S. Johnson, Associate Professor of Veterinary Pathobiology

- *Technology licensed by a commercial partner*: DNA test for canine degenerative myelopathy
- *First sales of a product that uses MU technology*: Animaline, a canine degenerative myelopathy diagnostic test for dogs that detects changes in the animal's superoxide dismutase 1 (SOD1) gene

K

Robert L. Kallenbach, Associate Dean of College of Agriculture, Food and Natural Resources Extension

- *Technology licensed by a commercial partner*: Mobile app for grass height measurements in pasture environments

Raghuraman Kannan, Michael J. and Sharon R. Bukstein Chair in Cancer Research; Professor of Radiology and Biological Engineering

- *Patent No. 11,447,550: Peptides for molecular detection of the protein PD-L1*
These peptide binders with improved sensitivity predict if a tumor will respond to a specific cancer therapy regimen.

Kiruba Krishnaswamy, Assistant Professor of Biological Engineering

- *Technology optioned by a commercial partner*: Upcycling of acid whey to create whitening agents that replace titanium dioxide

Mili Kuruvilla-Dugdale, Associate Professor of Speech, Language and Hearing Sciences

- *Technology optioned by a commercial partner*: Software for assessing oral motor skills in humans

L

Teresa E. Lever, Associate Professor of Otolaryngology

- *Technology optioned by a commercial partner*: Software for assessing oral motor skills in humans
- *First sales of a product that uses MU technology*: FluoroKennel, a videofluoroscopic imaging system for companion animals to diagnose and track swallowing disorders

Ryan Lock, Extension Specialist, Plant Science and Technology

- *Technology licensed by a commercial partner*: Mobile app for grass height measurements in pasture environments

Chris Lorson, Associate Vice Chancellor for Research; Curators' Distinguished Professor; Associate Dean for Research and Graduate Studies, College of Veterinary Medicine

- *First sales of a product that uses MU technology*: A monoclonal antibody that detects the human survival motor neuron protein responsible for spinal muscular atrophy

John A. Lory, Extension Associate Professor, Plant Science and Technology

- *Technology licensed by a commercial partner*: Mobile app for grass height in pasture environments

M

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

- *Patent No. 11,459,737: Low-cost water production system*
This highly efficient dehumidifier reduces electricity consumption and produces less noise than current models.

Lixin Ma, Associate Professor of Radiology

- *Patent No. 11,314,096: Airy beam optical coherence tomography system*
A noninvasive optical imaging technology with increased resolution at greater depth captures soft tissues to diagnose and manage eye diseases, such as retinopathy and glaucoma.

Hamed Majidifard, Postdoctoral Fellow, Civil and Environmental Engineering

- *Technology licensed by a commercial partner*: Machine vision software that assesses pavement damage and provides training data
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Clinton Meinhardt, Senior Research Specialist, Plant Science and Technology

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- *First sales of a product that uses MU technology*: Soybean variety SA17-8882

James Meng, Expert Programmer Analyst, MU Extension Technology and Computer Services

- *Technology licensed by a commercial partner*: Mobile app for grass height measurements in pasture environments

Wesley Moore, Senior Research Specialist, Plant Science and Technology

- *Soybean varieties licensed by commercial partners*: SA17-8882HOLL, SA18-350PR-HOLL, SA18-12111, SA18-14099, SA18-14232, SA18-15071, SA18-6603, SA18-7258, SA18-7406, SA18-7490, SA18-9109, SA18-11280, SA19-311H-HOLL, SA19-24408HOLL, SA19-12541 and SA19-28597
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N

Alice Nguyen, Research Specialist, Plant Science and Technology

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

- *Soybean varieties licensed and optioned by commercial partners*: S09-13608, S09-13185, S12-4718, S16-8290 and S17-17168

Xiaofan Niu, Associate Director Program/Projects, Health Management and Informatics

- *Soybean variety licensed by a commercial partner*: SA13-1385

P

David Porciani, Assistant Research Professor, Molecular Microbiology and Immunology

- *Patent No. 11,286,489: POSH inhibitor complex biomolecules and amphiphile micelles*
This therapeutic and delivery system targets a cell-signaling pathway to treat leukemia, breast cancer and other conditions.

Elizabeth Prenger, Senior Research Specialist, Natural Resources

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- *First sales of a product that uses MU technology: Soybean variety SA17-8882*

R

Kylee Rucinski, Clinical Researcher, Mizzou BioJoint Center and Integrated Joint Health Program

- *Patent No. 11,241,353: Knee flexion device*
A quantitative patient-controlled physical therapy device that can be used to treat pre- or post-surgery knee stiffness.

S

Andrew Scaboo, Assistant Professor of Plant Science and Technology

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- *First sales of a product that uses MU technology: Soybean variety SA17-8882*

Adam G. Schrum, Associate Professor of Bioengineering, Surgery, Molecular Microbiology and Immunology

- *Patent No. 11,426,462: Monovalent anti-CD3 adjuvants*
This antibody fragment can be used to amplify a patient's immune response to cancer and pathogens.

James Grover Shannon, Professor Emeritus of Plant Science and Technology

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Scotty Lee Smothers, Senior Research Associate, Plant Science and Technology

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George C. Stewart, Professor Emeritus of Veterinary Pathobiology

- *Patent No. 11,401,498: Bacillus-based delivery system*
This bacterial platform for enzyme expression delivers enzymes for advances in agriculture, bioremediation, biofuel production and other applications.

Aaron M. Stoker, Associate Director of the Thompson Laboratory for Regenerative Orthopaedics; Research Professor in Orthopaedic Surgery

- *Patent No. 11,503,823: Tissue preservation system*

This system more than doubles the storage time and increases the viability of orthopaedic grafts and tissues used in transplants.

U

Bret Ulery, Associate Professor of Chemical Engineering

- *Patent No. 11,286,489: POSH inhibitor complex biomolecules and amphiphile micelles*

This therapeutic and delivery system targets a cell-signaling pathway to treat leukemia, breast cancer and other conditions.

Mariola Usovsky, Senior Research Associate, Plant Science and Technology

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W

Duolin Wang, Research Scientist, Bioinformatics

- *Technology licensed by a commercial partner: Software to predict protein localization*

Gage West, Medical Research Office

- *Technology licensed by a commercial partner: Promotional video about patient care at MU*

Jonathan Williams, Doctoral Student, Pathobiology

- *Patent No. 11,241,353: Knee flexion device*

A quantitative patient-controlled physical therapy device that can be used to treat pre- or post-surgery knee stiffness.

X

Dong Xu, Curators' Distinguished Professor of Electrical Engineering and Computer Science; Paul K. and Dianne Shumaker Professor

- *Technology licensed by a commercial partner: Software to predict protein localization*

Y

Gang Yao, Professor of Biological and Biomedical Engineering

- *Patent No. 11,287,623: Optical polarization tractography systems*

High-resolution 3D imaging visualizes early tissue fiber abnormalities at the cellular level to diagnose signs of heart attack and other pathologies.

Ping Yu, Professor of Physics and Astronomy

- *Patent No. 11,314,096: Airy beam optical coherence tomography system*

A noninvasive optical imaging technology with increased resolution at greater depth captures soft tissues to diagnose and manage eye diseases, such as retinopathy and glaucoma.

Z

Habib Zaghouni, J. Lavenia Edwards Chair in Pediatrics; Professor of Molecular Microbiology, Immunology and Neurology

- *Patent No. 11,338,036: Type 1 diabetes preventative and treatment*
This combination therapy made with an antibody and stem cell can prevent and treat Type 1 diabetes.
- *Technology licensed by a commercial partner: Type 1 diabetes treatment*
- *Startup company created with MU-licensed technologies: ADSAT Therapeutics is developing a Type 1 diabetes treatment.*

Shuping Zhang, Professor of Veterinary Pathobiology; Director of the Veterinary Medical Diagnostic Laboratory

- *Patent No. 11,422,134: High-sensitivity impedance sensor*
This biosensor array enables rapid detection and quantification of bacteria and other analytes at low concentrations to detect toxins, prevent food-borne diseases and more.

Yunxin Zhao, Professor of Electrical Engineering and Computer Science

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