U.S. PATENTS ISSUED IN 2021 FOR MIZZOU INVENTIONS

Patents protect intellectual property, such as inventions that result from University of Missouri faculty and staff research. Mizzou's intellectual property is the raw material that sparks commercial ventures. The Office of Technology Advancement manages this asset, which is transferred to industry through the negotiation and execution of license agreements. Patents are an important incentive for a commercial partner to invest in developing a new product or service. Learn more about patents.

Contents:

Animal & Plant Biotechnology

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.

- MU inventors: Randall S. Prather, Kevin D. Wells and Kristin M. Whitworth

Increasing plant oil content for food and energy
(Patent No. 10,883,113)
This trait increases the overall seed oil content in crops.

- MU inventors: Matthew Salie and Jay J. Thelen

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.

- MU inventors: R. Michael Roberts and Bhanu Prakash Telugu

Computer Software

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.

- ✱ MU inventors: Michael Phinney and Chi-Ren Shyu

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.

- ✱ MU inventors: Teresa E. Lever, Filiz Bunyak Ersoy, Mili Kuruvilla-Dugdale and Yunxin Zhao

Devices & Tools

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 a donor graft.

- ✱ MU inventors: Ferris M. Pfeiffer, James L. Cook and James P. Stannard

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.

- ✱ MU inventors: Mahmoud Almasri and Nuh Sadi Yuksek

Devices & Tools
continued

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.

- ✱ MU inventors: Baek Hyun Kim and Jae W. Kwon

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.

- ✱ MU inventors: Hongbin (Bill) Ma, Willard Hanson and Zaichun Feng

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.

- ✱ MU inventors: James L. Cook and Aaron M. Stoker

Diagnostics & Detection

Composite nanomaterials and synthesis methods
(Patent No. 10,914,734)
These targeted gold nanoparticles deliver cancer therapeutics more precisely.

- ✱ MU inventors: Raghuraman Kannan, Ajit Prakash Zambre and Anandhi Upendran

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.

- ✱ MU inventors: Charles Jeffrey Smith and Rajendra Prasad Bandari

Diagnostics & Detection
continued

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.

- MU inventors: Kent S. Gates, Li-Qun (Andrew) Gu, Maryam Imani Nejad, Xinyue Zhang and Ruicheng Shi

Engineering Solutions

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.

- MU inventors: Mahmoud Almasri, Chuang Qu, Jiayu Liu and Ibrahem Jasim

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.

- MU inventor: Hongbin (Bill) Ma

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.

- MU inventors: David Heise, Marjorie Skubic and Licet Rosales Paniagua

Engineering Solutions
continued

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.

- ✱ MU inventors: Marjorie Skubic, James Keller, Marilyn Rantz, Mihail Popescu, Shuang Wang, Isaac J. Sledge, Rainer Dane A. Guevara and Elena V. Wright

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.

- ✱ MU inventor: Mahmoud Almasri

Therapeutics & Treatments

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.

- ✱ MU inventor: Gary Francis Clark

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.

- ✱ MU inventors: Shuping Zhang and Ming Yang

Therapeutics & Treatments
continued

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.

- ✱ MU inventors: Dongsheng Duan, Yi Lai, Junling Zhao and Yongping Yue

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.

- ✱ MU inventors: Chris L. Lorson and Erkan Osman

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.

- ✱ MU inventors: Sheila A. Grant, David Alan Grant and Daniel Nathan Grant

Topical and transdermal treatment for lymphedema
(Patent No. 10,918,629)
This compound activates the pumping function of the lymphatic vessels, reducing lymphatic fluids.

- ✱ MU inventor: Michael J. Davis