2014

Entrepreneurial Recognition Breakfast

Inaugural Event

University of Missouri

ENTREPRENEUR

en·tre·pre·neur

"Someone who organizes and operates a business or businesses, taking on greater than normal financial risks in order to do so."

- The Oxford English Dictionary

A lot comes to mind when one thinks of an entrepreneur:

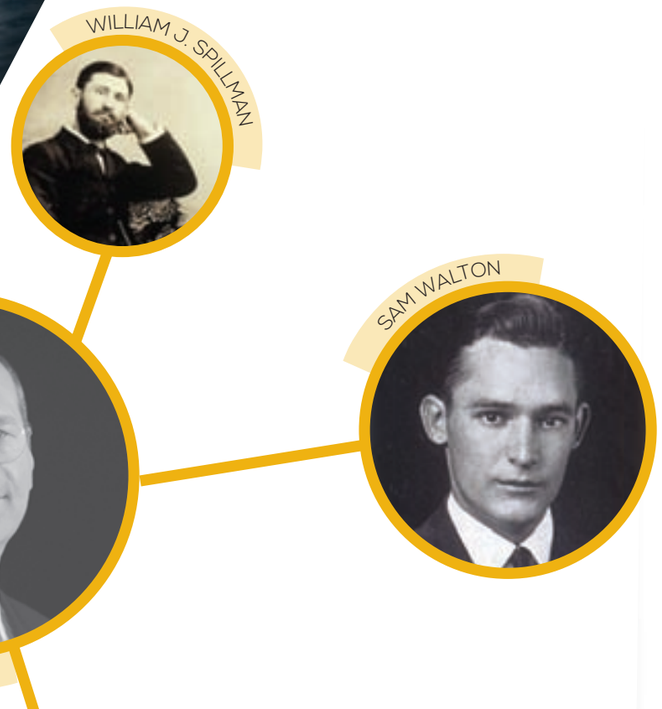
Innovator. Inventor. Pioneer. Improver. Achiever. Today, we honor members of the Mizzou community who truly embody these traits, celebrating their individual and group achievements, as well as the far-reaching, valuable benefits they have brought to the university as a whole.

Through their novel inventions and groundbreaking research, our entrepreneurs consistently show that excellence at Mizzou truly knows no bounds — and that new paths to innovation and achievement are being paved every day. We're immensely proud of our entrepreneurs for the role they play in our local, national, and global community. Whether they're developing cutting-edge technologies, feeding people all over the globe, or otherwise improving the world we live in, the accomplishments of MU entrepreneurs and inventors are treasured for far more than their educational value alone, and we're honored to recognize them this morning.

2014 | AGENDA

7:00	Registration and Seating
7:15	Breakfast Served
7:30	Chancellor R. Bowen Loftin - Innovation & Economic Prosperity University
7:45	Dr. Henry C. "Hank" Foley - FY2013 Issued Patents and Faculty Inventors & UM System Student Entrepreneurial Recognition
8:10	Steve Wyatt, J.D. - Entrepreneurial Recognition & Ecosystem
8:50	Chancellor R. Bowen Loftin - The Mizzou Advantage Entrepreneurial Awards & Closing Remarks

MIZZOU HERITAGE



From science to business and every discipline in between, the University of Missouri has long been a beacon for invention, discovery, enterprise and achievement.

Historically, our community has fostered the development of big-impact innovators who push the boundaries of what we're capable of: from Sam Walton, founder of Wal-Mart, now the largest employer in the U.S; to William F. Baker, structural engineer behind the Burj Kahlifa, the world's tallest manmade structure; and William Jasper Spillman, the founder of agricultural economics.

Today, that same entrepreneurial spirit is found in the ongoing accomplishments within our community. It's the combination of these inspirational success stories and the countless other everyday achievements from our students, faculty, staff and alumni that ultimately help foster a culture of excellence and entrepreneurship — paving the way for continued innovation and endless future opportunities.

ISSUED PATENTS

FY2013

In FY2013, 23 patents were issued to members of MU faculty who invented novel devices, discovered innovative methods, or otherwise proved something entirely unique through their research. Advancing the scope of human intelligence across various disciplines, the achievements of these innovators and entrepreneurs are truly at the forefront of human enterprise. But today, we not only honor the following faculty members for their contribution to their field and our global community; we also honor them for their exceptional employment of the scientific method to answer the unanswered, to know the unknown.

ISSUED PATENTS
FY2013

Homogeneous Mesoporous Nanoenergetic Metal Oxide Composites and Fabrication Thereof

Shubhra Gangopadhyay – Department of Electrical & Computer Engineering
Rajesh V. Shende – Department of Electrical & Computer Engineering
Steven Apperson – Department of Electrical & Computer Engineering
Keshab Gangopadhyay – Department of Electrical & Computer Engineering
Daniel Tappmeyer – Department of Electrical & Computer Engineering
Rajagopalan Thiruvengadathan – Department of Electrical & Computer Engineering
Andrey Bezmelnitsin – Department of Electrical & Computer Engineering
Bhushan Mehendale – Department of Electrical & Computer Engineering
Syed Barizuddin – Department of Electrical & Computer Engineering

This invention involves a new way to combine iron oxide and copper oxide. The resulting metal oxide forms a major component of electric fuel on the nanoscale. Metal nanoparticles such as these have significant application in the defense industry.

Composition Comprising Omeprazole, Lansoprazole and at Least One Buffering Agent

Jeffrey O. Phillips – School of Medicine, Department of Surgery

This invention involves novel roles of antacids and the role of chemical composition on their effects. This research adds to our understanding of biochemistry as well as pharmacology and may have pharmaceutical applications.

Self-Assembling Cell Aggregates and Methods of Making Engineered Tissue Using the Same

Gabor Forgacs – Department of Physics & Astronomy
Karoly Jakab – Department of Physics & Astronomy
Adrean Neagu – Department of Physics & Astronomy
Vladimir Mironov – Department of Physics & Astronomy

Tissue engineering offers promising solutions to problems caused by the growing demand for organ and tissue replacement therapies. Chief among these problems is a chronically low supply of transplantable organs. This team invented novel methods of cellular engineering that may improve the availability of tissues and organs for transplant patients.

Methods and Articles for Gold Nanoparticle Production

Cathy Cutler – MU Research Reactor
Kattesh V. Katti – School of Medicine, Department of Radiology
Raghuraman Kannan – School of Medicine, Department of Radiology
Kavita K. Katti – School of Medicine, Department of Radiology
Henry White – Department of Physics & Astronomy

This team invented novel methods for producing gold nanoparticles, which have a multitude of valuable applications in the fields of nanotechnology, biomedicine, medical imaging and others. Other example gold nanoparticle applications include smart windows, rewritable electronic paper, electronic panel displays, and memory components.

Stabilized, Biocompatible Gold Nanoparticles and Enviro-friendly Method for Making Same

Kattesh V. Katti – School of Medicine, Department of Radiology
Raghuraman Kannan – School of Medicine, Department of Radiology
Satish Kumar Nune – School of Medicine, Department of Radiology
Kavita K. Katti – School of Medicine, Department of Radiology

This team's invention provides biocompatible gold nanoparticles that are stabilized through environmentally friendly methods. Potential applications of the invention include medical diagnostics, medical therapies, sensors, and electronic materials. Gold nanoparticles are also used as coatings on biological and non-biological surfaces.

Visualizing Geographical-Area Change Detected from High Resolution, Remotely Sensed Imagery

Matt Klaric – Department of Computer Science
Curtis H. Davis – Department of Electrical & Computer Engineering
Grant Scott – Department of Computer Science
Chi-Ren Shyu – Department of Computer Science
Brian Claywell – Department of Electrical & Computer Engineering

This team invented a novel method, system and medium in order to present aspects of change associated with geographic area that have been captured by high-resolution, remotely sensed imagery. The invention involves accessing measurements from previously stored, remote datasets, and it has applications in satellite technology and geographic positioning systems.

Detecting Geographical-Area Change Using High Resolution Remotely Sensed Imagery

Curtis H. Davis – Department of Electrical & Computer Engineering
Brian Claywell – Department of Electrical & Computer Engineering
James Keller – Department of Electrical & Computer Engineering
Matt Klaric – Department of Computer Science
Grant Scott – Department of Computer Science
Chi-Ren Shyu – Department of Computer Science

This team invented novel variants of method, system, and medium in order to more accurately detect changes in geographic area. The invention involves accessing measurements from previously stored, remote datasets, and it has applications in satellite technology and geographic positioning systems.

A Device for Transfecting Cells Using Shock Waves Generated by the Ignition of Nanoelectric Materials

Shubra Gangopadhyay – Department of Electrical & Computer Engineering
Steven J. Apperson – Department of Electrical & Computer Engineering
Luis Polo-Parada – Dalton Cardiovascular Research Center
Keshab Gangopadhyay – Department of Electrical & Computer Engineering
Andrey Bezmelnitsin – Department of Electrical & Computer Engineering

This invention deals with making a miniature device to generate shock waves. The device uses the combustion of a nanoenergetic material to direct the shock waves into various biological cells and tissues. This device may find application in drug delivery and gene therapy.

Nanocomposite Dielectric Coatings

Shubhra Gangopadhyay – Department of Electrical & Computer Engineering
Maruf Hossain – Department of Electrical & Computer Engineering
Keshab Gangopadhyay – Department of Electrical & Computer Engineering

Thin coatings or films are used for a variety of application. High strength, scratch-resistant coatings are especially desirable in any application where the surface condition is critical to the performance of a device, such as optical components, surgical instruments, and small-scale electrical components. This invention involves novel processes for coating substrates with a nanocomposite material in order to achieve improved optical, mechanical and electrical properties.

Hybrid-AAV Vectors to Deliver Large Gene Expression Cassette

Dongsheng Duan – School of Medicine, Department of Molecular Microbiology & Immunity
Arkasubhra Ghosh – School of Medicine, Department of Molecular Microbiology & Immunity
Yongping Yue – School of Medicine, Department of Molecular Microbiology & Immunity

This invention is a hybrid adeno-associated virus (AAV) system to efficiently deliver a full-length dystrophin coding sequence. This strategy allows efficient expression of the full-length dystrophin protein from AAV vectors. Ultimately this invention will lead to a breakthrough in AAV-mediated gene therapy. The strategies described in this invention can also be applied to deliver other large genes for diagnostic and/or therapeutic purposes.

System and Method for Linking a Web-Based Resource with an Electronic Medical Record

Karl M. Kochendorfer – Department of Family & Community Medicine
Jared S. Coberly – Department of Family & Community Medicine

This invention is a data processing system and method that, in some cases, includes an EMR system and a web server. In some instances, the EMR system includes a plurality of electronic medical records for a plurality of patients. This invention has applications in family and community medical communication.

Methods of Producing Lower Alcohols from Glycerol

Galen Suppes – Department of Chemical Engineering

Glycerol is a sugar alcohol compound that has wide application in food and pharmaceutical production, as well as in other fields. This team invented a process for more valuable processing of fats and oils in order to slow down the production of glycerol and glycerol derivatives, increasing the compound's overall efficiency.

Processes for the Preparation of Calixarene Derivatives

Jerry L. Atwood – Department of Chemistry

This invention relates to a process for the preparation of calixarene derivatives, in particular phosphonated calixarenes. The present invention also relates to nano-structures of phosphonated calixarenes. This invention has applications in a multitude of disciplines involving chemistry.

Mass Sensing Device for Liquid Environment

Jae W. Kwon – Department of Electrical & Computer Engineering

This invention is a specially designed resonator to sense mass requiring high sensitivity in liquid environments. This is done without sensitivity loss from viscoelastic liquid environments, leading to potential applications in medical diagnostics and biosensing.

Compounds for Treatment of Copper Overload

Kavita K. Katti – School of Medicine, Department of Radiology
Raghuraman Kannan – School of Medicine, Department of Radiology
Stan Casteel – Department of Veterinary Medicine and Surgery
Kattesh V. Katti – School of Medicine, Division of Radiology and Hypertension

Copper overload is observed in various human conditions including cholestatic disorders, chronic ingestion of copper contaminated water, and in Wilson's disease. Similar conditions exist in veterinary medicine, including the susceptibility of sheep and various breeds of dogs to copper accumulation. This invention provides compounds, pharmaceutical compositions, and methods that can be used to treat pathologies that result due to copper overload or to the presence of reactive oxygen species.

Systems and Methods for Co-Doping Wide Band Gap Materials

Mark A. Prelas – Department of Nuclear Science and Engineering
Tushar K. Ghosh – Department of Nuclear Engineering
Robert V. Tompson – College of Engineering
Dabir Viswanath – College of Engineering
Sudarshan K. Loyalka – College of Engineering

A novel method of thin film doping, this invention was developed specifically for wide band-gap materials in order to dope AlN films. AlN has the widest bandgap of the III-V nitrides and therefore can produce the highest energy photons specifically in the VUV. Potential applications include high temperature electronics and photovoltaic cells for nuclear energy conversion.

Immunoassay for Venom Detection Including Noninvasive Sample Collection

Jonathan A. Green – Department of Animal Sciences

Envenomations by the brown recluse spider are a significant source of morbidity in endemic regions of the United States, and misdiagnoses are common. This extremely sensitive test can detect venom antigens down to about 20 picograms even after the sample has been shipped and stored for periods of up to three weeks during the summer.

Thin Disk Laser Operation with Unique Thermal Management

Hongbin Bill Ma – Department of Mechanical & Aerospace Engineering
Douglas E. Smith – Department of Mechanical & Aerospace Engineering
Vitaly Gruzdev – Department of Mechanical & Aerospace Engineering

A thermal management apparatus and method for a thin disk laser system enabling the laser system to have near isothermal temperatures across and throughout a thin disk comprising a mechanically controlled oscillating heat pipe that promotes near isothermal conditions in lasing of the thin disk, a thin disk lasing crystal or ceramic bonded to the mechanically controlled oscillating heat pipe, and a supporting structure including a surface bonded to the thin disk that matches the CTE (coefficient of thermal expansion) of both materials.

Categorically Ranking Animals for Feed Efficiency

Monty S. Kerley – Departments of Animal Sciences and Biochemistry
William Kolath – Department of Animal Sciences
Joseph Golden – Department of Animal Sciences

This team invented a simple blood test that ranks an animal within the population as high, mid, or low in feed efficiency. This invention provides a tool to identify animals that are genetically superior in feed efficiency and spur developments that later increase the feed efficiency.

Photo-Acoustic Detection Device and Method

John Andrew Viator – Department of Biological Engineering
Paul S. Dale – School of Medicine, Department of Surgery
Ryan M. Weight – Department of Biological Engineering
Peter Sutovsky – Departments of Animal Sciences and Biochemistry

This invention is a photoacoustic technology that detects and isolates melanoma cells by stainlessly circulating in the blood in an overall more effective and efficient manner. This has wide potential applications in oncology, such as for rapid diagnosis of melanoma as well as for monitoring melanoma patients.

Compositions and Methods for Early Pregnancy Diagnosis

Jonathan A. Green – Department of Animal Sciences
R. Michael Roberts – Departments of Animal Sciences and Biochemistry

This invention provides novel compositions and methods for early pregnancy diagnosis in cattle, which has a wide range of significant applications for the animal sciences.

Soy-Based Polyols

Galen Suppes – Department of Chemical Engineering
Zuleica Lozada – Department of Chemical Engineering
Arnold A. Lubguban – Department of Chemical Engineering

The invention provides novel processes for preparing soy-based oligomeric polyols (sugar alcohols) or substituted oligomeric polyols, as well as urethane bioelasteromers comprising the oligomeric polyols or substituted oligomeric polyols. This invention has wide applications in food science.

Plant Artificial Chromosome Platforms Via Telomere Truncation

Weichang Yu – Division of Biological Sciences
James A. Birchler – Division of Biological Sciences
Juan Vega – Division of Biological Sciences

Maintenance and inheritance of chromosomes in an organism typically requires three essential elements: origins of replication, a centromere and telomeres, as previously identified with yeast artificial chromosomes. This invention is a technology that will allow continued addition of transgenes as the need arises using engineered plant minichromosomes. This invention bears potential applications for genetically engineered crops.

TECHNOLOGY LICENSES GENERATING ROYALTY

FY2013

Mizzou faculty members in partnership with leading companies have been generating royalty revenue as a result of their inventions. These faculty members have not only advanced their feilds of study through patent-licensed innovations, they've also contributed to the success of countless others who have implemented their discoveries in their own work. Having lasted the test of time, the following technologies continue to be implemented into goods and services the world over — spreading innovation and economic prosperity across the globe.

LICENSES GENERATING ROYALTY
FY2013

Combination Vaccine for Endotoxin-Associated Diseases

Harold F. Garner – School of Medicine, Department of Veterinary Medicine and Surgery
Ronald F. Sprouse – Department of Pathology and Anatomical Sciences

This invention comprises a novel combination vaccine, with methods of preparation and treatment for protection against gram-negative bacterial diseases.

Method of Controlling Salmonella in Shell Eggs

J. M. Vandepopuliere – Department of Animal Science (Emeritus)

The presence of salmonella within shell eggs is a major concern for both consumers and producers of eggs. This invention relates to the production of a safer shell egg through thermal treatment.

Mouse Hybridoma Cell Line Secreting Monoclonal Autoantibody Binding Histones

Kim Wise – School of Medicine, Department of Molecular Microbiology & Immunology

Histones are the chief organizing proteins of DNA in the nucleus of all eukaryotic cells. This invention is a mouse monoclonal antibody from an autoimmune mouse model that detects all five classes of histones.

Method and System for Repairing a Tear in the Meniscus

Michael G. Maurizi – School of Medicine, Department of Surgery

Injury to the knee involving a tear in the meniscus is a common occurrence, often in the context of athletic events, and is prevalent in the younger population. The meniscus is recognized as being vital to the biomechanical stability and protection of the knee joint. This invention relates generally to methods and systems for repairing tears in cartilage and more particularly to a method and system for repairing a tear in the meniscus in the knee joint.

Simplified Omeprazole Solution

Jeffrey O. Phillips – School of Medicine, Department of Surgery

This invention relates to a pharmaceutical preparation containing a substituted benzimidazole. More particularly, the present invention relates to a substituted benzimidazole solution/suspension suitable for oral administration.

Wireless, Sensor-Based Lameness Evaluation System

Kevin G Keegan – Department of Mechanical and Aersospace Engineering
Perngjin Frank Pai – Department of Mechanical and Aerospace Engineering

This invention detects and analyzes patterns of vertical head and pelvic motion of a four-legged animal in correlation with at least one limb movement. The system includes a plurality of motion sensors attached to the head, pelvis (or along the center of the back), and at least one limb of the animal. A processing system, it receives the motion data and processes the motion data to detect and quantify forelimb and/or hindlimb lameness in the animal.

Detecting Geographical-Area Change Using High Resolution Remotely Sensed Imagery

Curtis H. Davis – Department of Electrical & Computer Engineering
Chi-Ren Shyu – Department of Computer Science
Grant J. Scott – Department of Computer Science
Matt Klaric – Department of Computer Science
Brian Claywell – Department of Electrical & Computer Engineering
James M. Keller – Department of Electrical & Computer Engineering

This invention involves a novel method, system, and medium in order to detect change in a geographic area.

Device to Assist Delivery of Fetal Head at Cesarean Section

Breton Foster Barrier – School of Medicine, Department of Obstetrics, Gynecology and Women's Health
Gary Francis Clark – School of Medicine, Department of Obstetrics, Gynecology and Women's Health

In some instances, complications may occur when a fetal presenting part (head or breech) is 'well applied' within the mother's pelvis during a cesarean delivery. This device assists in the delivery of the 'well applied' fetal head at cesarean section.

An Early Test for Pregnancy in Dairy Cattle

Jonathan A. Green – Department of Animal Sciences
Matthew C. Lucy – Department of Animal Sciences
R. Michael Roberts – Departments of Animal Sciences and Biochemistry
Sancai Xie – Department of Animal Sciences
Bhanu Prakash Telugu – Department of Animal Sciences

Pregnancy diagnosis is a critical aspect of sound reproductive management in the cattle (e.g. dairy and beef) industry. This invention relates to methods and compositions for detecting early stage pregnancy related to proteolytic activity.

SNP Selection for a 384 SNP Assay for Marbling, Ribeye Muscle Area, Yearling Weight and Heifer Pregnancy Rate in Angus Cattle

Jeremy Francis Taylor – Department of Animal Sciences
Robert D. Schnabel – Department of Animal Sciences

This invention provides methods for identifying a genetic polymorphism associated with increasing weaning weight in progeny of female beef cattle comprising the polymorphism.

Transgenic Animal Models of Disease

Randall Prather – Department of Animal Sciences

This invention provides transgenic, large non-human animal models of diseases and conditions, as well as methods of using such animal models in the identification and characterization of therapies for the diseases and conditions.

Process for Making Vegetable Protein Foods

Fu-Hung Hsieh – Department of Bioengineering
Harold E. Huff – Department of Bioengineering

Proteins are an essential element in human nutrition. Meat, in the form of animal flesh, and fish are the most common sources of high protein food. This inventive process may be used to provide high quality, fibrous meat analog compositions similar to chicken, fish or other meats of animal origin in appearance and mouthfeel.

Multiple Lumen Catheters for Hemodialysis – New Tip Design of Intravenous Catheter for Hemodialysis

John C. Van Stone – School of Medicine, Division of Nephrology and Hypertension
W. Kirt Nichols – School of Medicine, Division of Vascular Surgery
Zbylut J. Twardowski – School of Medicine, Division of Nephrology and Hypertension

This invention involves clot-resistant, multiple-lumen catheters. These catheters are associated with lower complication rates compared to other catheters for hemodialysis.

Development of Soybean Varieties

Satish (Sam) Anand – Department of Plant Sciences, (Emeritus)
Grover Shannon – Division of Plant Sciences
Dave Sleper – Division of Plant Sciences, (Emeritus)

Soybean cyst nematode was identified on soybeans in the USA in 1954, hindering crop quality and production. These inventions are new soybean varieties with resistance to the disease and other advantageous chemical traits.

THE 2014 UM SYSTEM
STUDENT ENTREPRENEURIAL

This award honors University of Missouri students who have demonstrated innovation, originality and entrepreneurial spirit in the development of processes, products, or technologies of commercial potential and/or of benefit to the University of Missouri system.

Zachary Beattie:

Beattie is the founder of two successful startups: Quirks Consignment Store and Safe Trek Mobile Security. He's had a hand in the early operations of three more. He will be formally recognized at an awards celebration in June.

THE MIZZOU ADVANTAGE
ENTREPRENEURIAL AWARDS

Two inventors have been selected to receive this award because they exemplify The Mizzou Advantage commitment to these goals and to interdisciplinary entrepreneurship.

Dr. Cathy Cutler:

Dr. Cutler has played a crucial role in the university's radiopharmacology success for many years. She is a Research Professor at the MU Research Reactor specializiing in cancer tumors and their treatments. She is actively involved in multiple interdisciplinary grants and projects and was part of a team that received a patent in 2013 relating to methods and articles for gold nanoparticle production.

Dr. Chi-Ren Shyu:

Dr. Shyu is the director of the MU Informatics Institute. His research interests include biomedical informatics, geospatial information retrieval, visual knowledge reasoning and data mining. He is frequently called upon to collaborate on interdisciplinary projects and was part of a team who received two patents relating to detecting and visualizing geographical-area change using high resolution remotely sensed imagery

It's no secret that our entrepreneurs bring innovation, achievement and pride to our Mizzou community. Fostering a culture of inventiveness and entrepreneurship, it's our honor to recognize their achievements today.

THANK YOU

Chancellor R. Bowen Loftin,
the MU Economic Development Office,
the MU Office of Research - Technology Management & Industry Relations,
and The Mizzou Advantage initiative
would like to extend our gratitude for your attendance.

We'd also like to thank our partner and co-sponsor,
Regional Economic Development, Inc. (REDI)
for their continual support of our entrepreneurs.