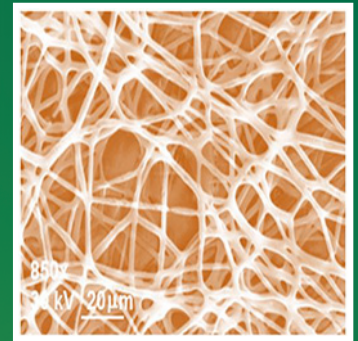


Advancing USF Innovation



***Life Science
Technologies***

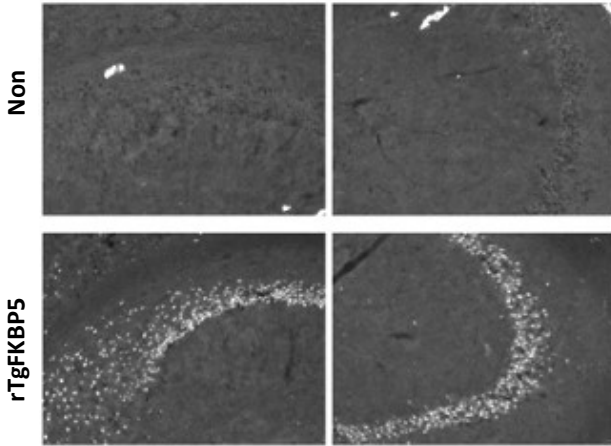


The University of South Florida (USF) Technology Transfer Office (TTO) was ranked in the Top 20 of American Universities for technology transfer by the prestigious Milken Institute. TTO endeavors to educate and promote innovation, the result of which is products, jobs and technologies utilized in the public interest. TTO's work allows for a sustained focus on transferring cutting-edge research and innovation to the commercial marketplace, generating revenue and diversifying the economy. USF is the nation's seventh leading public university in generating new United States utility patents and ranks 16th among universities worldwide in this key measure of innovation, according to the National Academy of Inventors (NAI) and the Intellectual Property Owners Association (IPO). With 96 new utility patents issued in CY 2018, USF continues to stand with some of the world's most prestigious institutions in the highly competitive arena. USF has ranked in the top 10 among public universities for U.S. patents granted for the past eight years.

The TTO negotiated 98 license and option agreements in FY 2019, and these agreements represent companies that have contracted with USF to further develop research into commercial products and to help bring USF's innovation into the marketplace.

USF facilitated the formation of seven new startup companies in FY 2019, and has facilitated the formation of 47 startup companies in the last five years. USF also had 173 disclosures in FY 2019.

Page	Area of Interest
3	Animal Models
5	Laboratory Methods
12	Laboratory Devices
15	Laboratory Materials



The successful detection of FKBP51 overexpression by staining and Western blot.

Conditional FKBP51 Over-Expression Transgenic Mouse

- Human FKBP51 is overexpressed in mice to exhibit depressive behavior
- Provides a new screening tool for therapeutic agents
- Can be used to screen for additional psychiatric disorders, including post-traumatic stress disorder and bipolar disorder
- **Live Specimens Available**

USF Tech ID# 13A006
Patent Pending

Technology Description:

Researchers at USF have developed a transgenic mouse model that causes the mouse to express depressive behavior. This was accomplished by the addition of a nucleotide sequence encoding human FKBP51 which was integrated into the mouse genome. This model is capable of over-expressing human FKBP51 in the forebrain, which causes the transgenic animal to exhibit depressive behavior.

The mouse model provides a method for studying the effect of a possible therapeutic agent on one or more phenotypes of the depressive-like behavior by comparing the effect to an untreated control animal. This technique offers the potential to improve drug development efforts in the pharmaceutical industry for psychiatric disorders.



Ube3a Rat Model for Angelman Syndrome

- A rat model that lacks the entire Ube3a gene, which is known to cause Angelman Syndrome
- All isoforms and alternative promoters of the Ube3a gene are also removed
- The model may be used for research as well pre-clinical testing of potential therapeutics
- **Live Specimens Available**

USF Tech ID# 16A060
Patent Pending

Technology Description:

Nearly all cases of Angelman Syndrome result from the disruption of a single gene: UBE3A. USF scientists have developed a rat model of Angelman Syndrome that closely mimics the complete deletion of the UBE3A gene containing region of chromosome 15 found in approximately 70% of Angelman cases. The rat model is completely UBE3A deficient with a genome lacking the entire UBE3A gene (including all isoforms and alternative promoters). This rat model may be used for basic research in regards to the disease as well as applied research for pre-clinical testing of potential therapeutics.



Transgenic Foxc2-tdTomato Overexpressing Mice

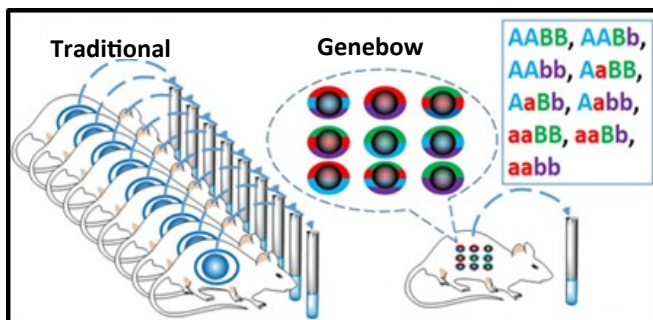
- Mouse model to overexpress the Foxc2-td gene via Cre recombinase
- Potential application to resolve genetic defects in lymphatic valve development
- **Live Specimens Available**

USF Tech ID# 17A097
Patent Pending

Technology Description:

USF researchers have designed a mouse model which has a transgenic construct inserted into the genome to overexpress the gene Foxc2. The construct is designed so that a strong ubiquitous promoter drives the cDNA for Foxc2 and is connected by a P2A linker.

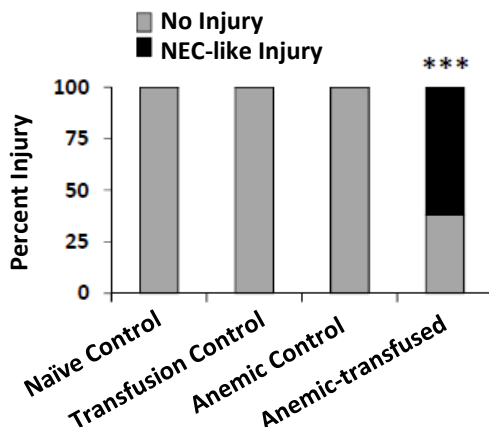
Currently, no widely available mouse models exist to overexpress the gene Foxc2 in a Cre-dependent manner. Foxc2 is a necessary transcription factor for the embryonic development of lymphatic valves as well as for lifelong maintenance of the valve structures. This mouse model may help researchers gain insight into genetic defects of the lymphatic valves.



Sensitively Studying Gene-Gene Interactions Over a Wide Genetic Background

- Uses the CRISPR method to generate novel mouse models
- Allows first-generation mice to be used, which greatly expedites modeling of gene-gene interaction over a wide genetic background
- Eliminates genetic, epigenetic and environmental variations
- **Product in Development**

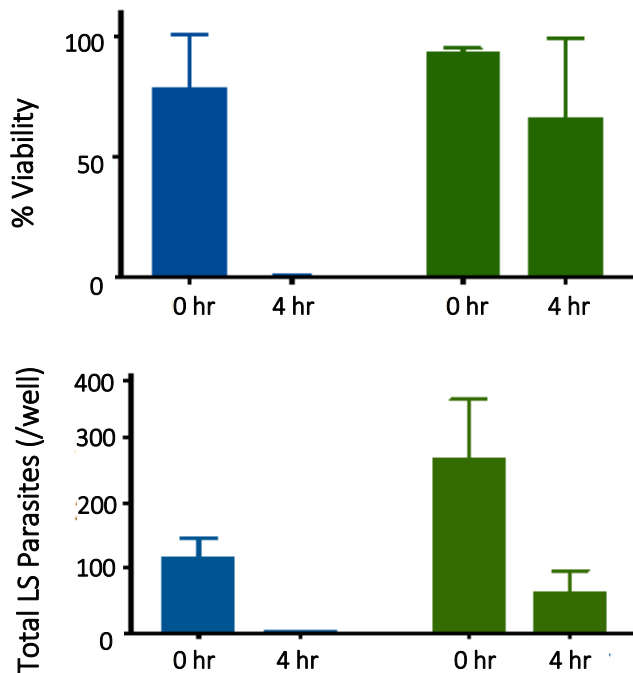
USF Tech ID# 14B153
US Patent# 9,974,290



Preclinical Model of Neonatal Necrotizing Enterocolitis

- An animal model to investigate red blood cell transfusions and NEC-like bowel injuries in mouse pups with severe anemia
- Is consistent with the typical course of transfusion-associated NEC in human infants
- Supports the idea that the incidence of NEC in premature infants peaks at a postmenstrual age

USF Tech ID# 17A053
Patent Pending



The above graphs show that Plasmodium sporozoites retain viability in insect based media but not in human based media after four hours.

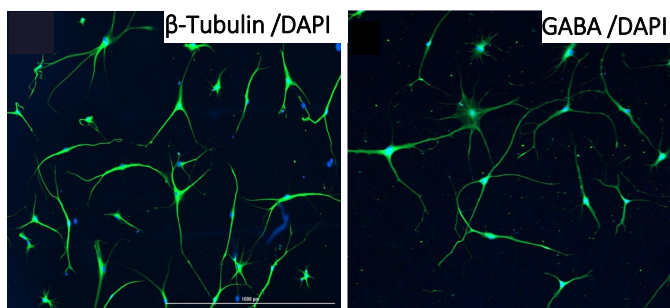
Sporozoite Cryopreservation Compositions and Methods

- Retains significantly high viability of cryopreserved infective malaria cells
- Applicable towards a whole-parasite vaccine
- Plays a key role in liver stage research
- Is effective for plasmodium research

USF Tech ID# 18A008
Patent Pending

Technology Description:

Researchers at the University of South Florida have developed a novel method to allow harvested sporozoites to be cryopreserved and thawed effectively. This method will allow the sporozoites to retain a significantly high viability and infectivity at 70% or greater, which is a substantial improvement when compared to the current standard. Retaining such a high viability and sporozoite functionality overcomes the limitations presented previously in Plasmodium sporozoite and liver stage research. Sporozoites and other parasitic cells prepared aseptically in this manner are suitable for clinical use as a whole-parasite vaccine and pre-clinical discovery research studies.



After 8-10 days, when cells started showing neuron-like morphology, they were fixed with 4% PFA and first stained with the primary antibody, neuron-specific β -Tubulin (A) and vesicular GABA transporter (B). The secondary antibody used was Alexa-488 for immunofluorescence. The nuclei were counterstained with DAPI.

Direct Conversion of Human Skin Fibroblast into Neurons Using a Faster and Cheaper Alternative

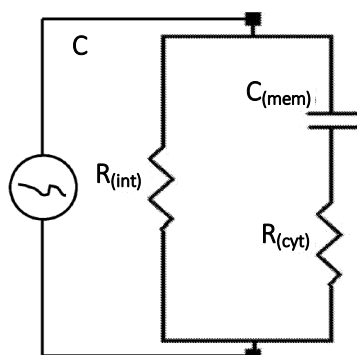
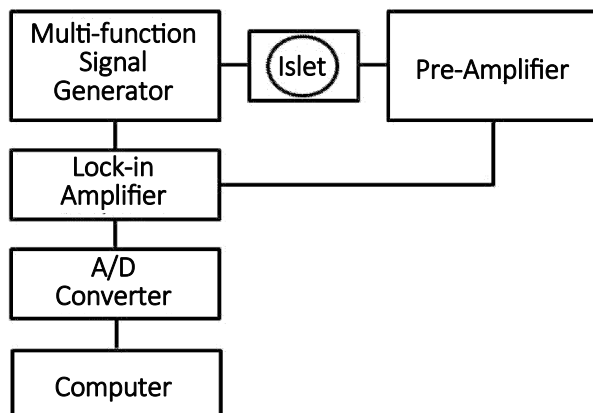
- A modified protocol to convert human skin fibroblasts into neurons using a readily available medium
- Neurons are directly converted without transition into iPSCs and without the use of neurotrophic factors
- Lower cost and faster conversion method

USF Tech ID# 15A014
US Patent# 9,481,864

Technology Description:

Researchers at the University of South Florida have developed a novel method to obtain neurons from human skin fibroblasts in half the time previously reported. This method uses readily available medium to convert the cells without the complicated and lengthy generation of induced pluripotent stem cells (iPSCs). This method lowers costs and increases time efficiency.

This newly discovered method will be a crucial component in the advancements of ex-vivo assays. It will also expedite personalized medicine approaches for the treatment of Alzheimer's disease and other neurodegenerative diseases.



Methods and Systems of Detecting Exocytosis of a Target Molecule from a Population of Cells

- A method used to monitor insulin exocytosis at the whole islet level in response to an insulin secretagogue
- High throughput screening
- A less expensive, simple and more sensitive method

USF Tech ID# 15A096

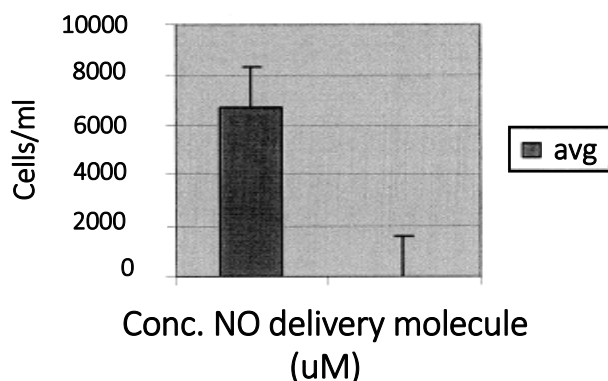
US Patent# 9,739,734

Technology Description:

USF researchers have developed a simple yet sensitive method for high throughput analysis of single pancreatic islet viability and potency using impedance analysis. Impedance analysis of electrical circuits enables separation of resistance and capacitances and characterization of the actual values in the circuit. This method has been successfully utilized to monitor insulin exocytosis at the whole islet level in response to an insulin secretagogue.

This approach could not only be used as an industry standard for assessing and sorting human islets prior to transplantation, but will also advance islet transplantation procedures and explorations for treatments of diabetes by monitoring functional release of insulin from single islets.

K Brevis PCD Experiment 1



The results of a Karenia brevis culture with 100 mM of nitric oxide.

Harmful Algal Bloom Mitigation by Induction of Programmed Cell Death

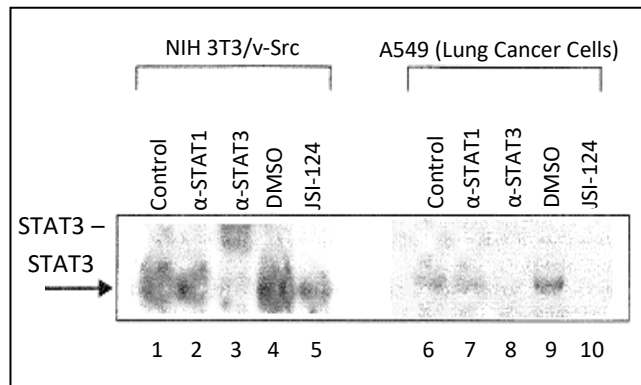
- A method for controlling algal blooms via induced apoptosis
- Suitable for any type of aquatic medium (marine, freshwater, brackish & artificial)
- May be used as a preventative measure for harmful algal blooms

USF Tech ID# 09A050

US Patent# 8,476,196

Technology Description:

University of South Florida inventors have developed compositions and methods for controlling harmful algal blooms. These compositions induce apoptosis in the harmful algae blooms, ultimately terminating them. The invention comprises of nitric oxide donating compounds, other algaecidal agents, and PCD inducers which can be an agent or treatment that induces the apoptosis pathway in the algae. This invention is applicable as a preventative measure or treatment option. It can be used for any type of aquatic medium (marine, freshwater or brackish) and it is also applicable to an artificial environment such as an aquaculture system, aquarium, field sample, filter media, pool etc.



Inhibition of STAT3 DNA-Binding Activity and STAT3-Mediated Transcription by JSI-124

Molecule that Inhibits STAT3 Activation: Development of a Phospho STAT3 Cytoblot High Throughput Assay

- A method for the treatment of tumors and cancerous tissues
- Prevents tumorigenesis and malignant transformation through the modulation of STAT3 intracellular signaling
- Anti-tumor activity demonstrated *in-vitro* and *in-vivo*

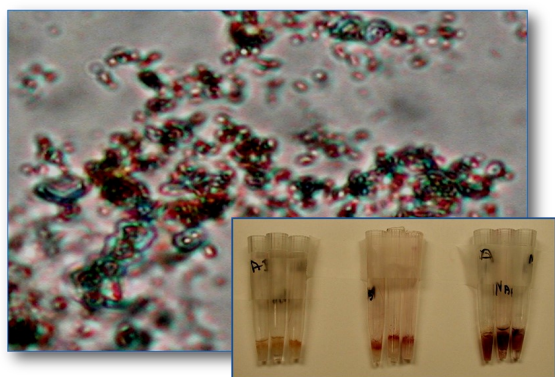
USF Tech ID# 01A026

US Patent# 7,998,947 & 8,691,799

Technology Description:

Researchers at the University of South Florida have developed a method for the prevention of tumor formation and malignant transformation through the modulation of signal transducer and activator of transcription 3 (STAT3) and Janus kinase (JAK) intracellular signaling.

USF inventors have discovered a novel method using the pharmaceutical cucurbitacin I, or JSI-124, to suppress the JAK/STAT3 tumor survival pathway, therefore exhibiting potent antitumor activity. Further, research has showed that growth of cancer cells in a patient can be inhibited by local and systemic administration of JSI-124 compounds. Cucurbitacin I can modulate JAK/STAT3 activity both *in vitro* and *in vivo*. This method can treat multiple cancer types including pancreatic cancer, prostate cancer, lung cancer and breast cancer and can be administered intravenously, intramuscularly, orally, and intranasally.



Column based collection, enrichment, and detection of microsporidia from 100µL of blood

Novel Methods for the Staining of Fungi and Protozoa: Development of Staining Kit

- Methods are applicable to fungal and protozoan detection in both environmental and biological samples
- Techniques are rapid, specific and sensitive methods
- Applicable as a routine detection test

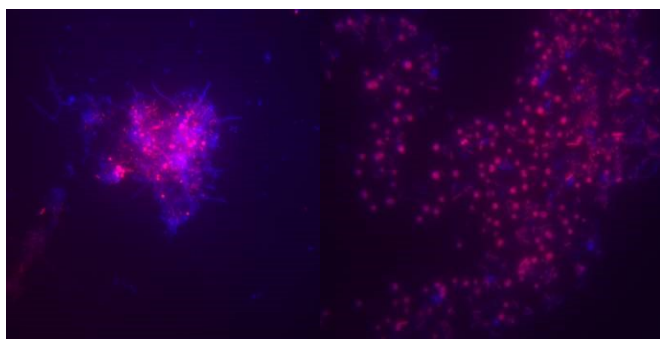
USF Tech ID# 02A034

US Patent# 7,745,168; 7,157,242 & 8,609,365

Technology Description:

Researchers at the University of South Florida have developed improved methods for the detection and diagnosis of various fungi and protozoa.

Our researchers have developed a set of methods that are applicable to fungal and protozoan detection in both environmental and biological samples. The first protocol involves a staining procedure that is sensitive to fungi and protozoa due to the presence of chitin in the composition of these organisms. The second method entails affinity column chromatography using chitin binding beads or fibers for the isolation and detection of fungi or protozoa. Both techniques are rapid, specific, and sensitive methods that could be used as routine tests for the detection of chitin-containing microorganisms in media and tissue.



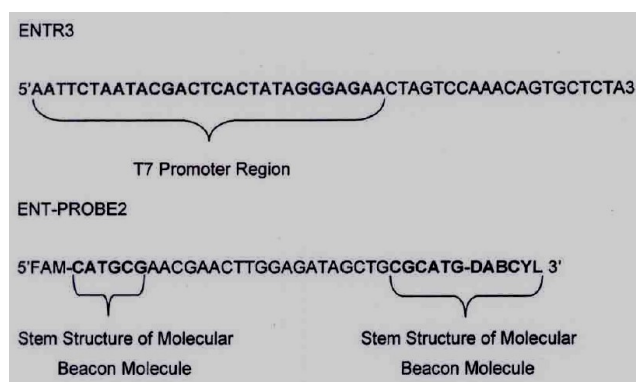
FISH analysis of activated sludge targeting two different bacteria.

Method for Controlling Microbial Cells for Separation

- May improve the performance of bioreactors by removing contaminants or enriching microbes
- Unlike antibody based separation, this technology has an unlimited shelf life and is reusable
- May be used with a variety of environmental samples

USF Tech ID# 06A014

US Patent# 8,795,498

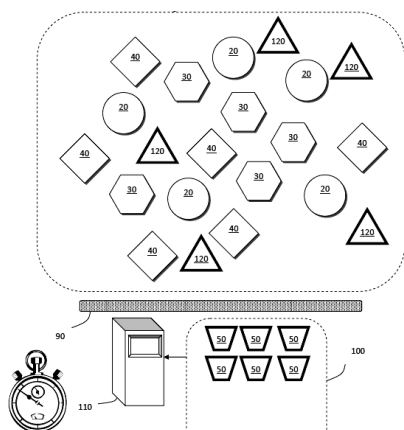


Molecular Detection and Quantification of Enterococci

- A method for rapid detection and quantification of fecal bacteria responsible for human recreational water illnesses (RWIs)
- Uses acid sequence based amplification (NASBA) to amplify ribonucleic acid (RNA)
- Rapid detection with high sensitivity and precision
- Reduction in false negatives

USF Tech ID# 06A039

US Patent# 7,947,441

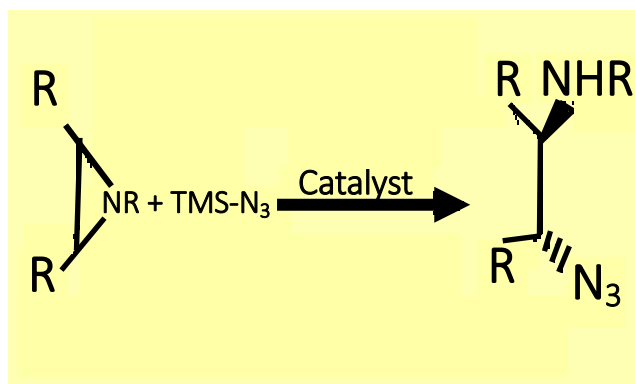


Barrier-Permeable Proxy Reporter Analysis

- Utilizes molecular tags that target a desired molecule, cell or particle and can then report the presence of the target without interferences from the environmental media
- Gives the detector the ability to remain in its preferred configuration
- Keeps the environmental media isolated

USF Tech ID# 06A054

US Patent# 7,879,622

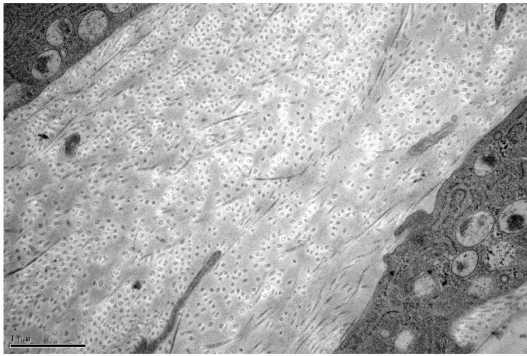


Enantioselective Bronsted Acid-Catalyzed Ring-Opening of Aziridines

- Excellent enantioselectivity
- Can be completed in an environmentally benign set of conditions
- Potential application in preparation of pharmaceuticals

USF Tech ID# 07A029

US Patent# 7,799,934



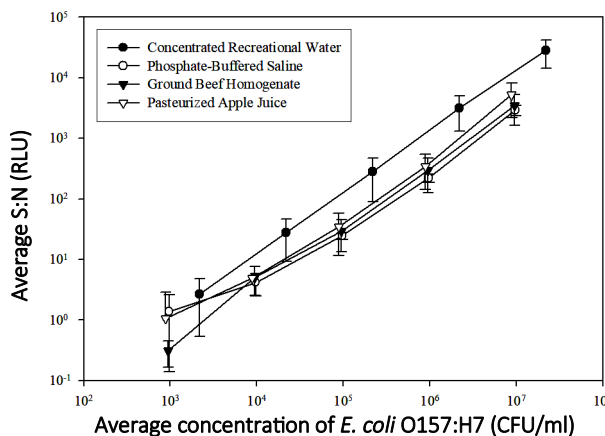
Transmission electron micrograph of keratocytes grown in an authentic scaffold.

Enhanced Formation of Extracellular Matrix by Overlaying Cultured Cells with a Volume Exclusion Agent

- Increases the formation of collagen fibrils and extracellular matrix
- Allows for higher tensile strength and better structural integrity of the cells in culture
- Yields a more normal cell topography in the bioengineered tissue

USF Tech ID# 08A052

US Patent# 8,623,646

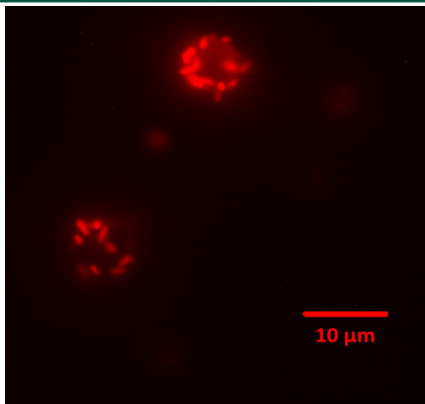


ATP Bioluminescence Immunoassay

- Can determine viability of specific bacterial contaminants in food products, beverages, and public water sources
- A reliable procedure that can be completed in one hour
- Minimal or no sample pre-treatment involved
- Plate or dipstick formats

USF Tech ID# 09A010

US Patent# 8,518,658 & 9,116,151



Fluorescent Image of *E. coli* O157:H7 Treated with CAT-FISH.

Capture Antibody Targeted Fluorescent In-Situ Hybridization (CAT-FISH)

- Accommodates various fluorescence requirements
- Allows multiple combinations of probes and antibodies
- Is an inexpensive kit that utilizes inexpensive and commercially available reagents

USF Tech ID# 10B092

US Patent# 9,714,943

miRNA Name (Family)	miRNA Sequence (Family)	Homology Scores
hsa-miR-376b MIMAT0002172	ATCATAGAGGAAAATCCATGTT	7000
hsa-miR-376a MIMAT0000729	ATCATAGAGGAAAATCCACGT	3268
mmu-miR-376a MIMAT0000740	ATCGTAGAGGAAAATCCACGT	1460
mmu-miR-376b MIMAT0001092	ATCATAGAGGAACATCCACTT	924
hsa-miR-376c MIMAT0000720	AACATAGAGGAAAATCCACGT	696
mmu-miR-376c MIMAT0003183	AACATAGAGGAAAATTCACGT	684
hsa-miR-517a MIMAT0002852	ATCGTGATCCCTTTAGAGTGT	7000
hsa-miR-517b MIMAT0002857	TCGTGCATCCCTTTAGAGTGT	5324
hsa-miR-520g MIMAT0002858	ACAAAGTGCTTCCCTTTAGAGTGT	1472
hsa-miR-521 MIMAT0002854	AACGCATCTCCCTTTAGAGTGT	1464
hsa-miR-522 MIMAT0002868	AAAATGGTCCCTTTAGAGTGT	1460
hsa-miR-517c MIMAT0002866	ATCGTGATCCCTTTAGAGTGT	1176
hsa-miR-519d MIMAT0002853	CAAAGTGCTCCCTTTAGAGTG	1160
hsa-miR-520h MIMAT0002867	ACAAAGTGCTTCCCTTTAGAGT	908
hsa-miR-519a MIMAT0002869	AAAGTGATCTCTTTAGAGTGT	744
hsa-miR-518c MIMAT0002848	CAAAGCGCTTCTTTAGAGTGT	664
hsa-miR-525-3p MIMAT0002839	GAAGGCGCTTCCCTTTAGAGCG	660
hsa-miR-519e MIMAT0002829	AAAGTGCTCTCTTTAGAGTGT	536
hsa-miR-518b MIMAT0002844	CAAAGCGCTCCCTTTAGAGGT	492
hsa-miR-519b-3p MIMAT0002837	AAAGTGATCTCTTTAGAGTGT	420

QmiR, A Computer Program for Designing PCR Primers for UQmiR miRNA RT-qPCR Assay

- Primers can be designed for specific miRNAs and for miRNA amplification
- Can handle thousands of miRNA sequences at once
- Ensures specificity when using miRNAs in a research setting

USF Tech ID# 11A031

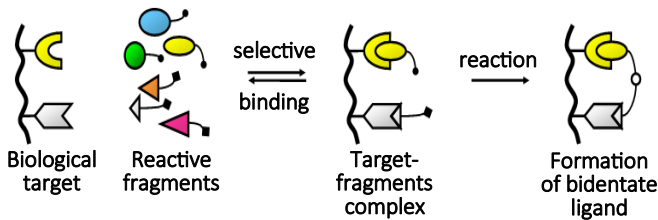
Patent Pending



Blue Collagenase Assay

- Measures both soluble and insoluble cell or tissue-associated collagenase activity
- Stains lyophilized collagen in its native state without solubilization by acid and/or gelling by heat
- Allows for qualitative observation of collagenase activity and quantitative activity via a spectrophotometer
- Can also be used to analyze metallo-proteinases in humans and other animals

USF Tech ID# 13A062
Patent Pending

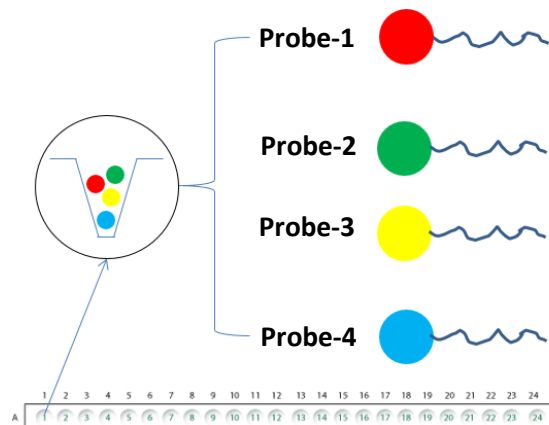


A schematic representation of Kinetic Target-Guided Synthesis.

Fragment Evolution via Kinetic Target-Guided Synthesis for the Identification of Potent Bcl-2 Modulators

- Rapid identification of modulators of protein-protein interactions
- Applicable to any undruggable targets such as protein-protein interaction targets or protein-DNA/RNA interactions
- Applicable to the pharmaceutical, biotechnology, and drug design industries

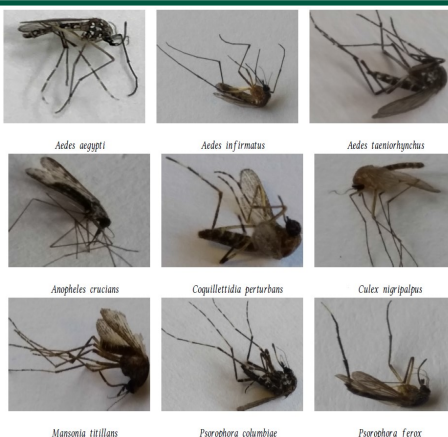
USF Tech ID# 13B140
Patent Pending



Universal qPCR Duplex Detection of mRNAs and miRNAs

- A multiplexed RNA Quantitative PCR Assay
- Simultaneous detection of one or more microRNA species and/or one or more messenger RNA species from one or more samples
- Four PCR reactions can be performed in one well
- Reduction in cost, time and experimental errors

USF Tech ID# 13B164
US Patent# 10,030,263



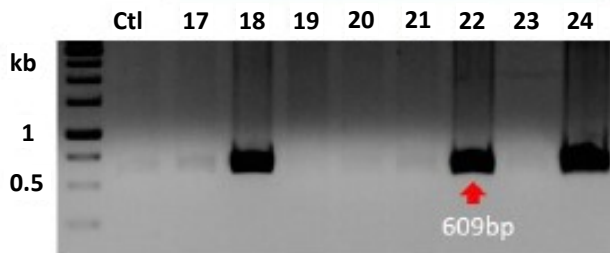
A Representative Sample of Some Classified Mosquito Species

An Automatic System of Tagging and Uploading of Mosquito Species from Smartphone Images

- A cloud-based system
- Real-time identification and reporting
- Minimal to zero human intervention required
- Time and cost savings
- Improved accuracy

USF Tech ID# 18B171
Patent Pending

CRISPR Injected

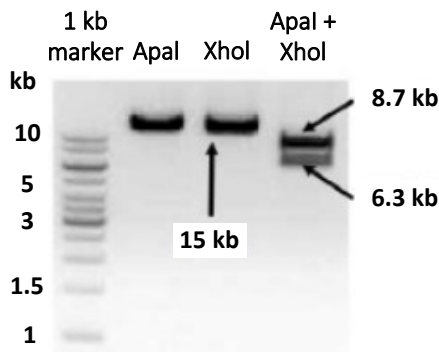


Nested PCR detection of zygotes correctly injected with CRISPR reagents.

Efficient CRISPR Knock-in

- High knock-in efficiency of HDR without NHEJ inhibitors
- Ability to knock-in large fragments with the absence of undesirable bi-allelic knock-ins
- High survival rate of zygotes
- Low toxicity and cost

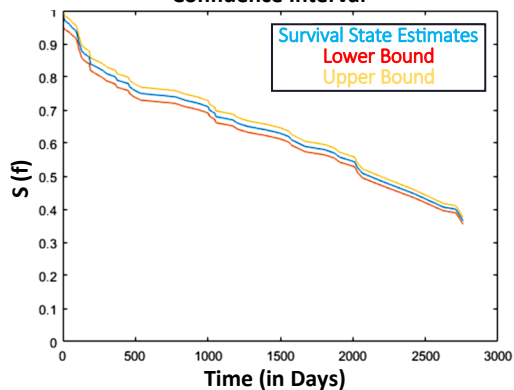
USF Tech ID# 15B127
Patent Pending

**Site-Directed Mutagenesis without Polymerase Chain Reaction**

- Small DNA fragments can be cloned seamlessly into a vector without using the PCR technique
- Allows for simple and seamless mutagenesis with high efficiency
- Could be combined with the CRISPR/Cas9 technique

USF Tech ID# 16A036
Patent Pending

Survival Function Estimates of Right Censored Data with 95% Confidence Interval

**A System and Method for Nonlinear Time-to-Event Statistical Data Analysis**

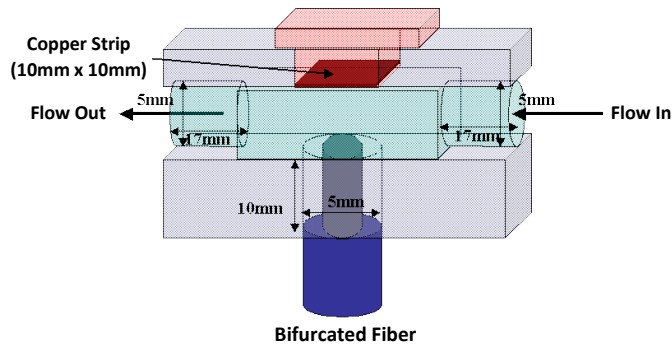
- An innovative nonlinear hybrid dynamic model for survival data analysis
- Determines both the size and location of changes in hazard rate with certain degree of confidence
- Applicable to a multitude of fields

USF Tech ID# 17B124
Patent Pending

**Conversion of Octolig® to a Lithium-Ion Control Agent**

- Significant lithium ion removal of greater than 99% using column chromatography, Octolig®, and Tetrahydrofuran (THF)
- Possible lithium extraction from various materials
- Effective in multiple research methods

USF Tech ID# 17B178
Patent Pending

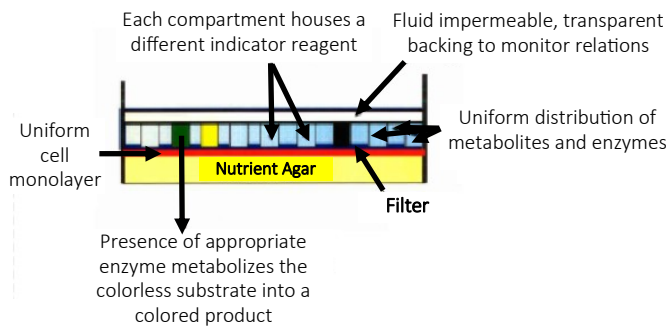


Sensor Apparatus for In Situ Analysis of Chemical and Biological Species

- A submersible, self propelled apparatus
- Provides an improved method to analyze a component contained in a liquid or fluid medium in situ or in an on-site situation
- Capable of measuring large volumes of fluids without a pumping system and utilizes a highly-sensitive contaminant assay system

USF Tech ID# 02B081

US Patent# 8,557,183 & 8,603,395

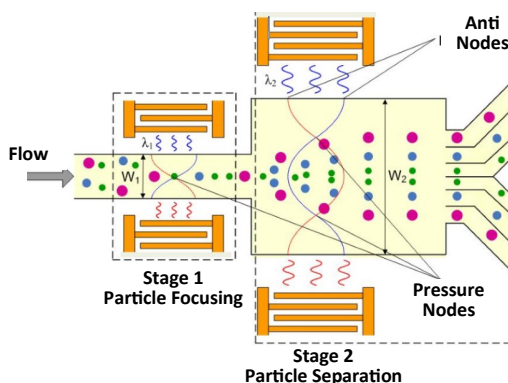


Magnetic Metabolite Transfer Disks and Diagnostic Transfer Disks

- Used for the transfer and identification of microbial species and their metabolites
- Could be adapted as a bandage or wound dressing
- Has the potential to be automated for industrial use

USF Tech ID# 07B144

US Patent# 8,697,437



A Schematic of the working mechanism for the two-stage particle separator using SAW

Two Stage Acoustic Microfluidic Microparticle and Cell Separation System

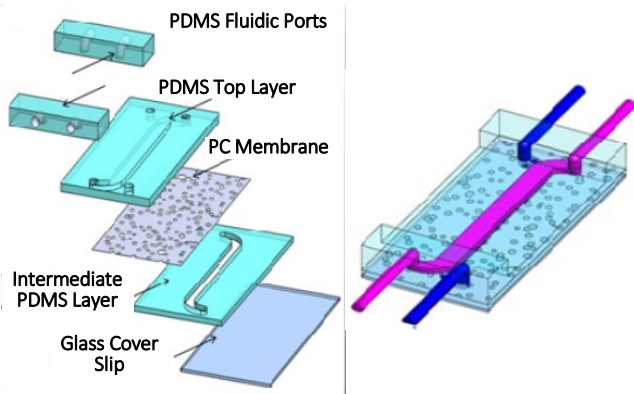
- Continuous microparticle and cell separation using surface acoustic waves
- Biological samples are handled gently with no physical contact between the ultrasonic transducer and the medium
- The use of the sheath flow for positioning is not required

USF Tech ID# 10B132

US Patent# 9,821,310

Technology Description:

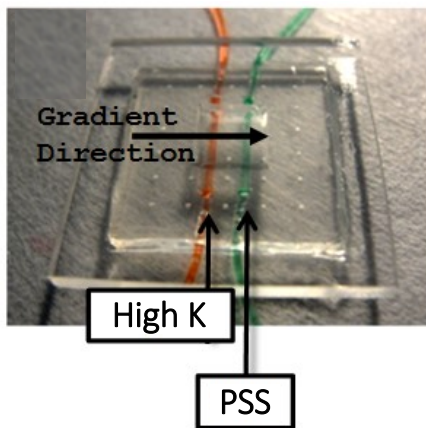
Our researchers have developed a novel surface acoustic wave (SAW) based two-stage microfluidic platform for continuous particle focusing and separation. The driving force is acoustic radiation generated by surface acoustic waves in a microfluidic device over a piezoelectric substrate. The prominent features of this two-stage sorter are that particle focusing and separation are accomplished simultaneously and the sorter doesn't require the use of the sheath flow for positioning or aligning of particles, thereby decreasing the complexity. In this design, no physical contact is needed between the ultrasonic transducer and the medium. Ultrasonic treatment has not been shown to damage cells or biological material.



Membrane-Integrated Microfluidic Device for High-Resolution Live Cell Imaging Fabricated via a Novel Substrate Transfer Technique

- Allows for high resolution images on either side of the membrane in a tissue mimetic environment
- Continuous perfusion of necessary nutrients and gasses
- Can be adapted to any membrane-based cell culture which requires high resolution imaging screening methods, including drug discovery methods

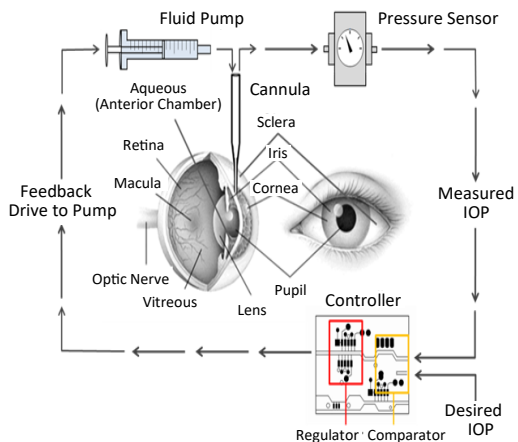
USF Tech ID# 12A045
Patent Pending



Microfluidic Device for Generating Neural Cells to Simulate Post-Stroke Conditions

- Generates normoxic, anoxic, and hypoxic environments *in vitro* to replicate the *in vivo* conditions that occur during an ischemic stroke
- Allows for precise control over input parameters (drug candidates, cytokines, ect.)

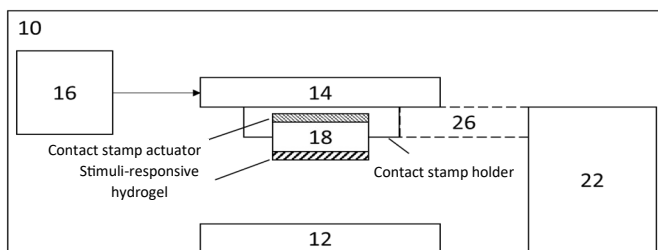
USF Tech ID# 12A047
US Patent# 8,912,006 & 9,632,076



Auto-Regulation System for Intraocular Pressure

- A wireless device for continuous pressure monitoring
- Eliminates manual sampling of pressure
- Allows complete control of the specific input parameters
- Reduced time and increased sample rate

USF Tech ID# 12A082
US Patent# 9,022,968 & 9,314,375

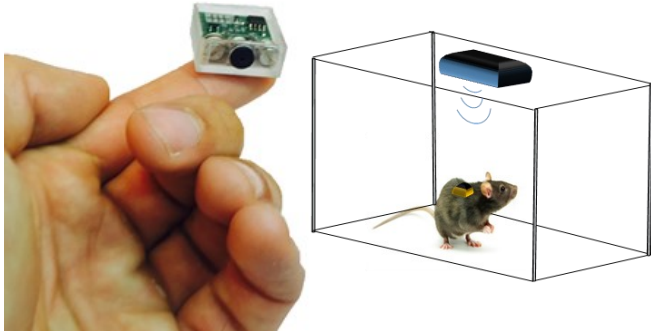


A diagram of the high-throughput bioprinting platform.

High-Throughput Platform for Bioprinting Tissue Modules

- Versatile platform for complex tissue formation
- Maintains cell morphology in tissue modules during assembly of 3D structures
- Integrates into existing 3D printing systems

USF Tech ID# 14B171
Patent Pending

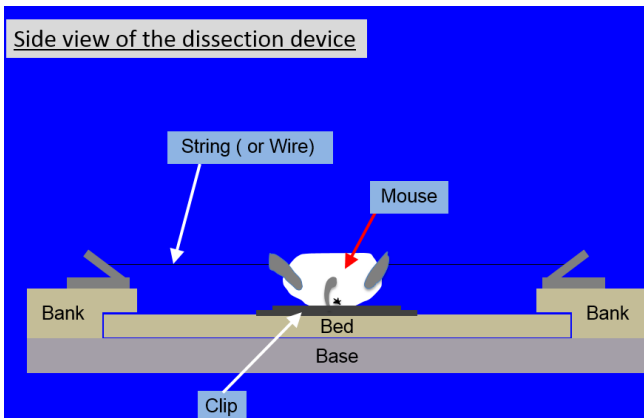


Continuous Wireless Powering of Moving Biological Sensors

- Can deliver a constant power supply
- Eliminates power related drifts and their corresponding recalibration procedures
- Increased data resolution and decreased size

USF Tech ID# 15A052
US Patent# 10,027,179

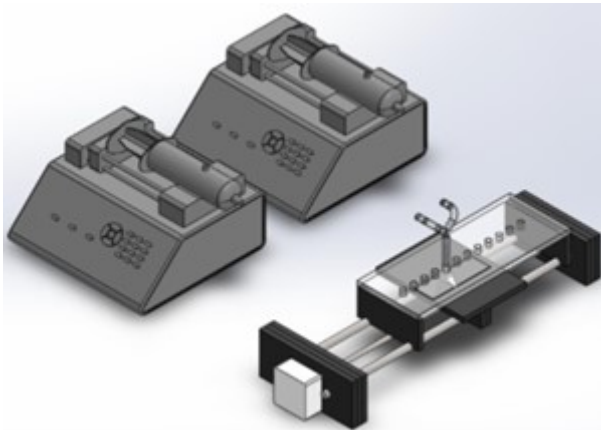
Side view of the dissection device



A Mouse Dissection Device Expediting Sample Collection

- The simplified multilayer structure accommodates a wide range of animal sizes
- Durable structure and easy clean-up design
- Allows for expedited sample collection from small animals

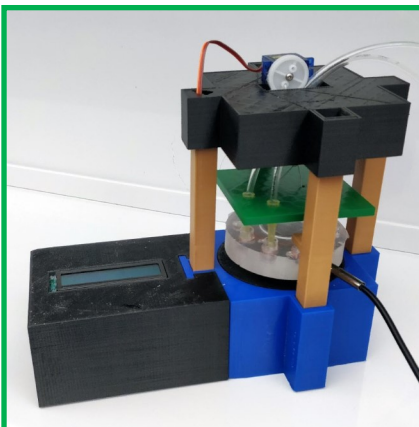
USF Tech ID# 15B170
US Patent# 9,622,842



Polymer Gradient Creation System

- Allows the creation of complex gradients of multiple polymer or liquid components
- Components such as nanoparticles or cells can also be imbedded into the polymer matrix
- Allows for high accuracy and control

USF Tech ID# 17A019
Patent Pending

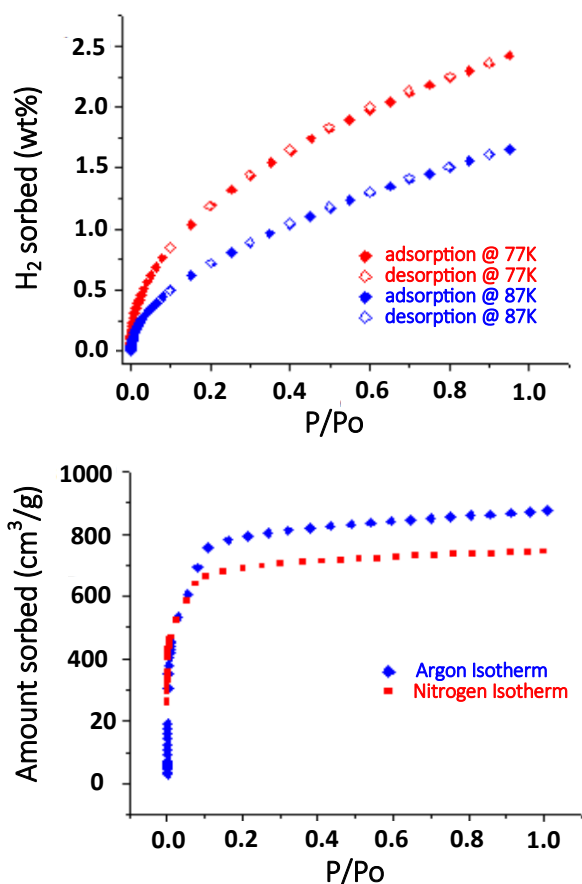


Complete View of
the PDMS
Incubator Design

Mobile Phone Based ELISA with Incubator and Automatic Fluid Dispensing

- User friendly
- Simple imaging is possible with the transparent incubator
- Non-flammable organic composite
- **Prototype available**

USF Tech ID# 18B163
Patent Pending



Supramolecular Assemblies and Building Blocks

- Simple and highly modifiable materials
- Greater potential for the prediction, design, and synthesis of the network topology of a framework based on a singular network topology
- Potential application in areas focused on carbon dioxide capture, methane storage, gas separations and drug delivery

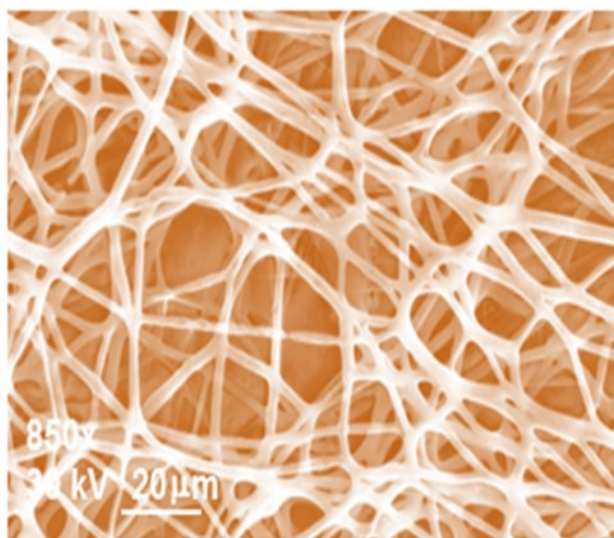
USF Tech ID# 07B130

US Patent# 8,034,952

Technology Description:

Researchers at USF have invented a novel approach to unequivocally design functional porous materials based on hierarchical bottom-up assembly utilizing targeted supermolecular building blocks (SBBs). These building blocks provide a greater potential for the prediction, design, and synthesis of the resultant network topology of the constructed metal-organic, or covalent-organic frameworks.

This invention also provides corresponding designed ligands that can be used as monomers in the preparation of SBBs and the triangular molecular building blocks (MBBs). The dual composition of these materials and their extra-large cavities offer great potential for their use in areas such as separation, controlled release and/or sequestration of gases, chemosensors and drug delivery.



Electrospun fibrils

Polypeptide Electrospun Nanofibrils of Defined Composition

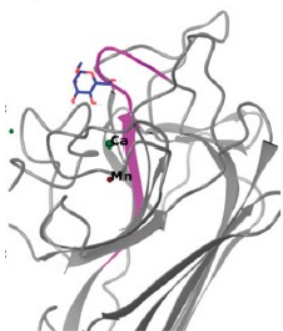
- Homogeneous nanofibers made of pure synthetic polypeptides
- Have increased stability through crosslinking
- Are biodegradable by enzymes over time
- Possible applications include surgical sutures, wound dressings, tissue engineering scaffolds, medical textile materials and drug delivery depots

USF Tech ID# 09B135

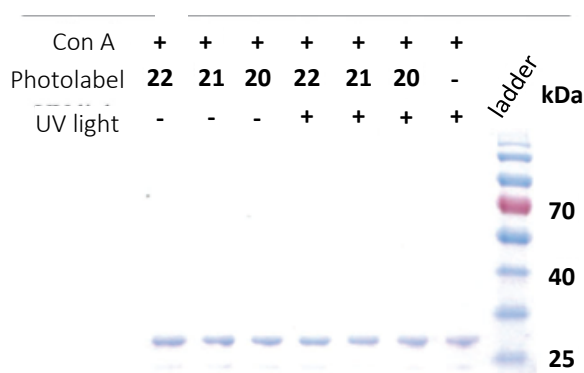
US Patent# 9,428,849

Technology Description:

University of South Florida researchers have developed homogeneous nanofibers made of pure synthetic polypeptides. These materials have physical, chemical and biological properties that make them advantageous for replacing traditional materials in medicine and tissue engineering. Biocompatible and bio-absorbable materials are needed to help minimize the foreign-body response that often occurs during surgical procedures. These biomaterials are also biodegradable by enzymes over time.



A visual depiction of the native ligand mannose bound to Con A.



Coomassie stained gel of photolabeled Con A and controls.

3-Trifluoromethyl-3-Aryldiazirine Photolabels with Enhanced Ambient Light Stability

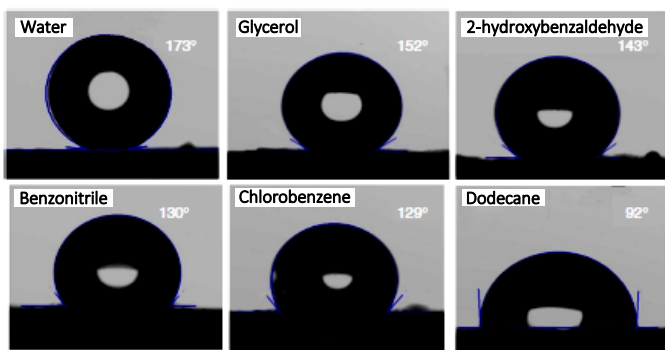
- A successfully synthesized ambient-light stable photolabel
- Enhanced ambient light stability and aqueous solubility
- Enhanced photo-affinity labeling could help to introduce chemical probes into drug discovery, identifying new drug targets and molecular interactions

USF Tech ID# 16A024
US Patent# 10,067,136

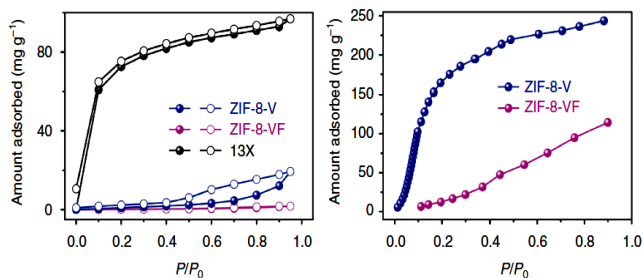
Technology Description:

Researchers at USF have successfully synthesized an ambient-light stable photolabel without compromising the photoactivated insertion reactivity. The photolabels, synthesized with 3-trifluoromethyl-3-aryldiazirine, have allowed reserachers to overcome the many obstacles of traditional photolabel techniques, including cumbersome synthesis, instability to ambient light conditions, and limited aqueous solubility.

This invention will enhance photoaffinity labeling thereby furthering its applications. Such applications may include drug discovery and the identification of new drug targets and molecular interactions.



Target-Specific Amphiphobic Porous Materials



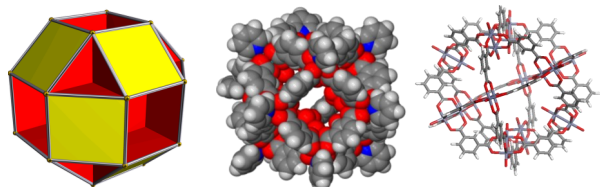
Imparting Amphiphobicity on Single-Crystalline Porous Materials

- The amphiphobic porous materials resist all kinds of liquids but allow the adsorption/permeation of gases
- Exhibits superhydrophobicity, oleophobicity, high crystallinity and intact porosity
- Applications in a variety of fields such as microelectronics, medicine and military

USF Tech ID# 16B177
Patent Pending

Technology Description:

Researchers at the University of South Florida have developed a method to impart superhydrophobicity or amphiphobicity on porous materials while still maintaining gas permeability. This property is a pioneering invention to protect crystalline porous materials under various chemical environments. The treated porous materials resist all kinds of liquids, but allow the adsorption/permeation of gases. These materials may have many important applications in a variety of fields such as microelectronics, medicine and military.



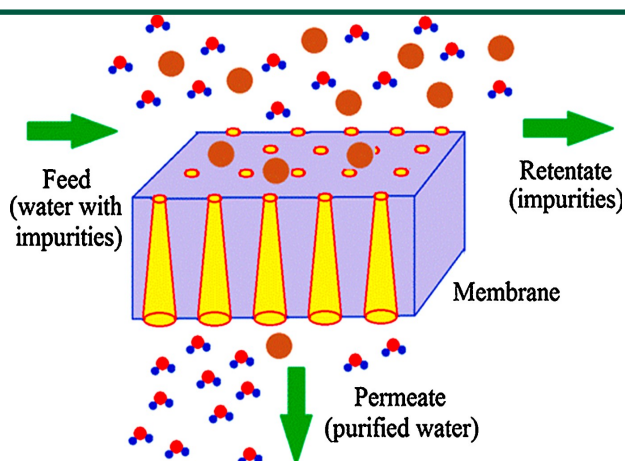
The prototypal nanoscale faceted polyhedron that is based upon a small rhombihexahedron.

Nano-Scale Faceted Polyhedra

- Chemical robustness and diversity allow the technology to be made from magnetically and catalytically active metals
- Contains internal and external cavities suitable for encapsulating organic or other chemical species
- Applications include areas of liquid crystal technology, magnetic devices or applications, and drug delivery as adjuvant or carriers

USF Tech ID# 01A012

US Patent# 6,965,026

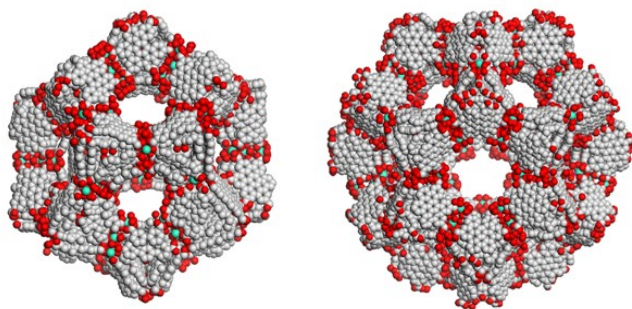


A Dialytic Fuel Cell Using a Chitosan Based Membrane Electrode Assembly

- Multiple applications including reverse osmosis and dialytic power generation
- Nontoxic and renewable
- Readily abundant and natural material

USF Tech ID# 18B189

Patent pending



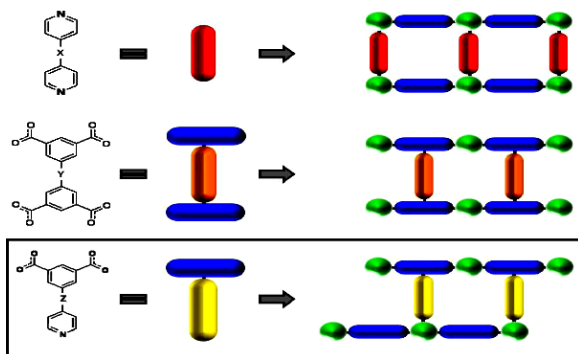
3.9 nm and 4.9 diameter cages in Tb-meso Metal-Organic Framework.

Polyhedral Cage-Containing Mesoporous Metal-Organic Frameworks as Platform for Biocatalysis

- Enhanced activity and greater stability of the immobilized enzyme in comparison to current technologies
- High surface area, structural versatility and solvent adaptability
- Various biocatalysis applications in chemical, pharmaceutical and food industries

USF Tech ID# 11A083

US Patent# 9,404,105



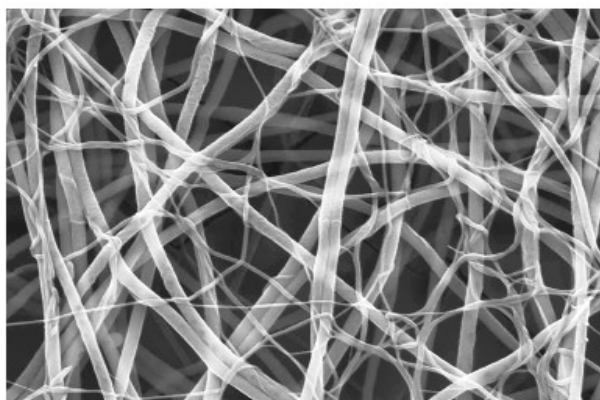
A scheme representing the various layered MOF (side view) pillaring techniques using exemplary ligands.

Supramolecular Building Layer (SBL) Approach: A Novel Route to Metal-Organic Framework (MOF) Platform Design and Synthesis

- Simple and highly tunable
- Made-to-order Metal-Organic Frameworks with potential in carbon dioxide capture, methane storage, and gas separation
- Wide range of applications in catalysis, magnetic materials, semi-conducting materials, chemosensors, and biosensors

USF Tech ID# 11B117

US Patent# 9,139,599



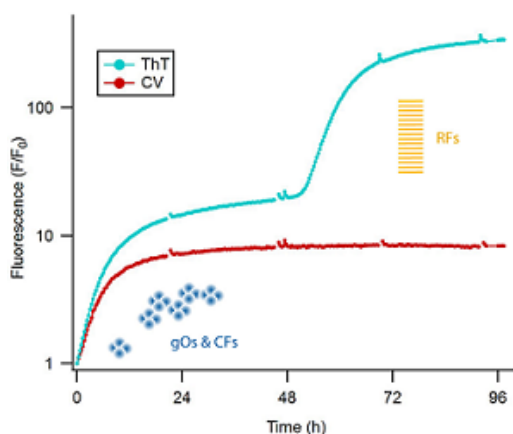
Fibers in the prepared polymers with a ribbon-like appearance.

Peptide-Based Materials

- Novel bio-inspired polymeric materials made of random polypeptides of known amino acid composition
- Cost efficient and highly practical
- Potential application in the materials manufacturing niche
- Eliminates unnecessary consumption of non-renewable resources, therefore reducing non-biodegradable waste

USF Tech ID# 12B157

US Patent# 9,932,443



ThT was Shown to Detect Both gOs/CFs and RF onset (second uprising), While Crystal Violet (gOI) Responded Only to gOs/CFs

Oligomer-Selective Fluorescent Indicator Dye

- A selective indicator of gOs and CFs
- Potential to detect amyloids *in vitro* and *in vivo*
- An early stage neurodegenerative disease detection method
- Amyloid detection in tissues or bodily fluid samples

USF Tech ID# 18B174

Patent Pending



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