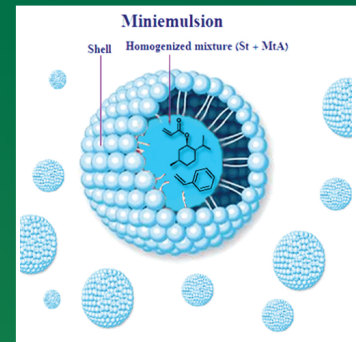
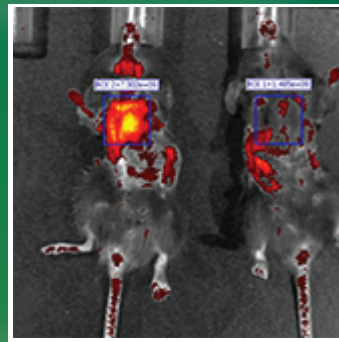
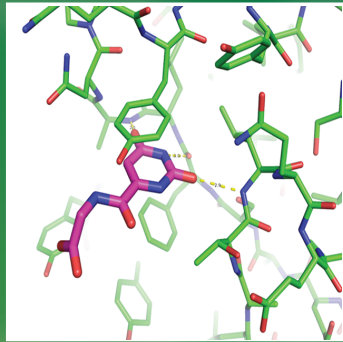


# Advancing USF Innovation



## *Therapeutics*

Oncology

Antimicrobials

Drug Delivery

Diagnostics

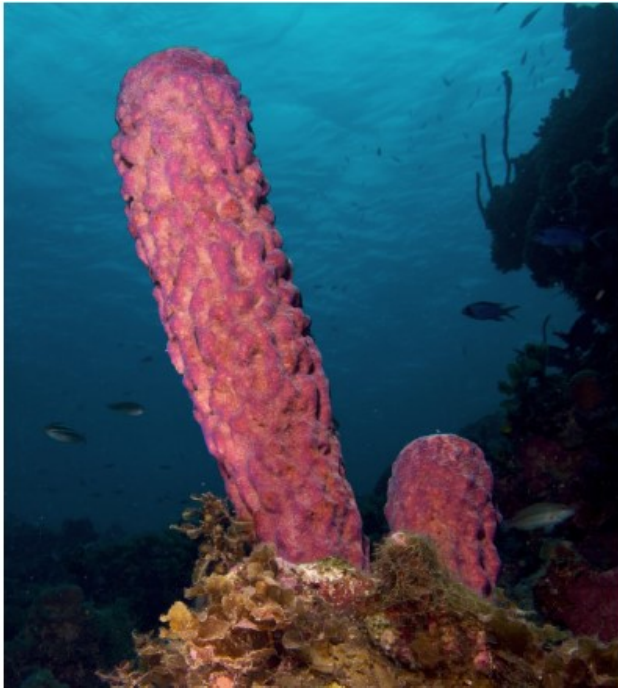


The University of South Florida (USF) Technology Transfer Office (TTO) was ranked in the Top 20 of American Universities for technology transfer by the prestigious Milken Institute. TTO endeavors to educate and promote innovation, the result of which is products, jobs and technologies utilized in the 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	Anti-Bacterial
10	Anti-Parasitic
13	Anti-Viral
15	General Diagnostics and Biomarkers
18	Cancer Diagnostics and Biomarkers
20	Drug Delivery
26	General Cancer Therapeutics
33	Immune and Inflammatory
36	Women's Health and Oncology



A sessile Antarctic deep-sea sea coral.

**Clostridium Inhibitors**

*A Natural Clostridium Difficile Treatment Method Isolated from an Antarctic Coral*

**USF Tech ID# 18B138**

**Patent Pending**

Therapeutic indication: Anti-bacterial

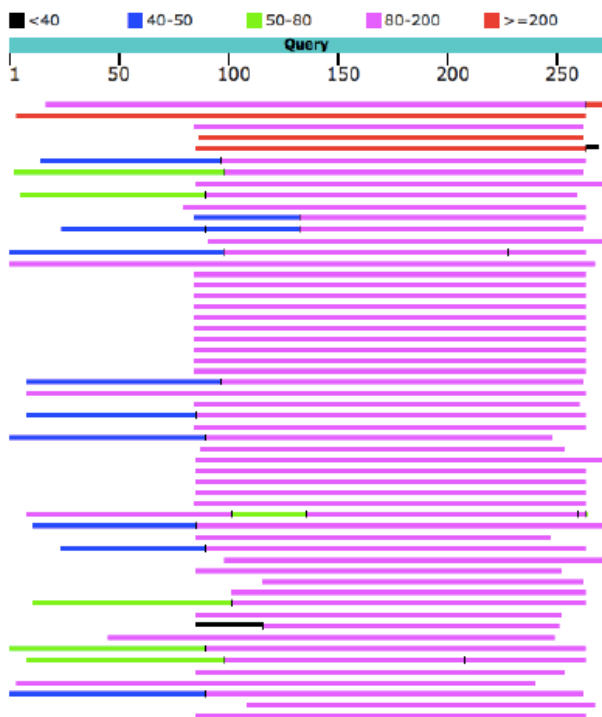
Mechanism of action: Alcyopterosin and Alcyopterosin E

State of Technology: *In vitro*

**Technology Description**

USF researchers have identified Alcyopterosin and Alcyopterosin E from an undescribed Antarctic deep-sea coral, which are capable of inhibiting *Clostridium difficile* infections at low nano-molar concentrations. These bioactive compounds have exhibited specific inhibition of *Clostridium difficile* bacteria in laboratory settings. Due to their novelty, these compounds have the potential to be developed as new drug candidates, reducing the need to treat this infection with current antibiotics. Alcyopterosin and Alcyopterosin E also exhibited inhibition towards *Leishmania donovani* and HeLa cancer cells.

**Color Key for Alignment Scores**



A distribution of the top 161 Blast hits on 100 subject sequences.

**Strategy to Increase Anti-Viral, Anti-Microbial and Anti-Fungal Defense**

*SINEs with Complementary Sequences for Potential Targeting*

**USF Tech ID# 18A080**

**Patent Pending**

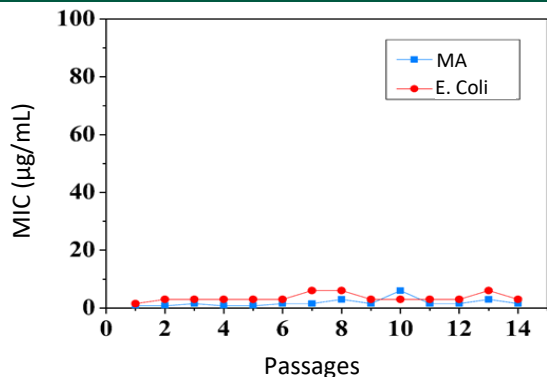
Therapeutic indication: Anti-viral, anti-microbial and anti-fungal defense

Mechanism of action: Transcribed SINEs with complementary genomes to use in future vaccines

State of Technology: *Compositions*

**Technology Description**

Researchers at the University of South Florida have identified a series of novel SINES and antisense SINES which target viral, bacterial and fungi genomes for the degradation and/or inhibition of translation and replication. These SINEs are also able to induce an innate immune response. Furthermore, in vitro transcribed SINEs may be used in future vaccines against viral, microbial, fungal, and parasitic infections.



The figure shows MRSA and E. Coli gain no increase in resistance after repeated exposure to bis-cyclic guanidines.

**Novel Bis-Cyclic Guanidines as Potent Membrane-Active Antibacterial Agents with Therapeutic Potential**  
*Small Molecular Antibacterial Agents that Manifest Antibacterial Activity Against Several Resistant Bacterial Strains*

**USF Tech ID# 17B105**

**US Patent Number: 10,144,713**

Therapeutic indication: Anti-bacterial

Mechanism of action: Bis-cyclic guanidines

State of Technology: *In vitro*

Compound	MIC (Mtb-rep) (µg/ml)	IC50 (J774) (µg/ml)	M. abscessus (% inhibition)			
			300 µg/ml	150 µg/ml	75 µg/ml	37.5 µg/ml
EG12-25A-3-DNMT-EtOAc-A	n/d	n/d	0.0	0.0	0.0	0.0
EG12-25A-3-DNMT-EtOAc-B	~75	~200	49.5	40.6	30.5	0.0
EG12-25A-3-DNMT-EtOAc-C	~20	~100	78.1	79.6	70.7	35.3
EG12-25A-3-DNMT-EtOAc-D	~10	~100	62.6	67.2	50.4	0.0
EG12-25A-3-DNMT-EtOAc-E	~25	~100	67.7	65.6	56.9	23.3
EG12-25A-3-DNMT-EtOAc-F	~20	~50	87.3	82.3	70.3	52.8
EG12-25A-3-DNMT-EtOAc-G	~15	~50	92.6	88.0	65.6	58.2
EG12-25A-3-DNMT-EtOAc-H	12.43	~25	92.9	89.6	70.7	34.4
EG12-25A-3-DNMT-EtOAc-I	~40	n/d	89.7	71.1	40.9	4.4
EG12-25A-3-DNMT-EtOAc-J	~50	n/d	79.7	61.7	42.6	7.1

**Mangrove Endophytic Fungal Natural Products Inhibit Mycobacterium Tuberculosis**

*Fungi Metabolites as Novel Treatments for Tuberculosis*

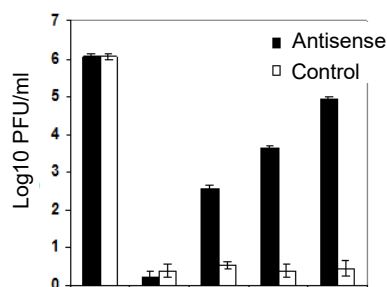
**USF Tech ID# 19B118**

**Patent Pending**

Therapeutic indication: Anti-bacterial

Mechanism of action: Fungi metabolites

State of Technology: *In vitro*



	+	+	+	+	+
RSV	+	+	+	+	+
IFN-γ	-	+	+	+	+
As-ODNs	-	-	3	30	90
(nM)					

**A Mucosal 2-5 Oligoadenylate Synthetase DNA Vaccine for Respiratory Syncytial Virus**

*An Intranasal IFN-g Gene Transfer Therapy that is Effective in the Treatment of Respiratory Syncytial Virus (RSV)*

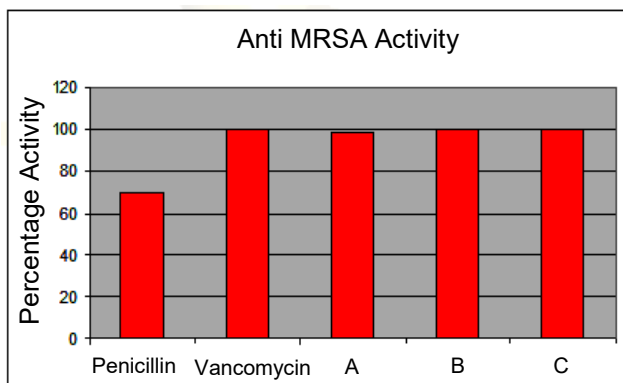
**USF Tech ID# 01A046**

**US Patent Number: 7,354,908; 8,293,717 & 8,802,647**

Therapeutic Indication: Treatment of RSV

Mechanism of Action: IFN-g gene transfer therapy

State of Technology: *In vitro*



**N-Thiolated 2-Oxazolidinones: A New Class of Anti-Bacterial Drug**

*Highly Potent Antibiotics Against Drug-Resistant Microbes*

**USF Tech ID# 05A047; 06A017; 06B096; 07B118**

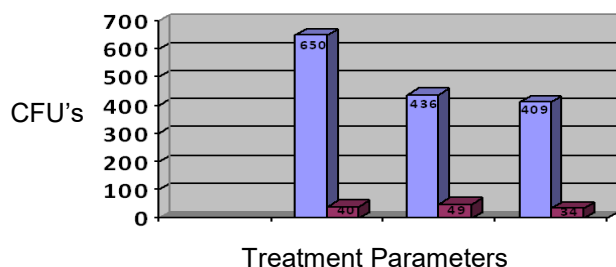
**US Patent Number: 8,703,963; 7,482,467; 7,332,611; 8,722,937; 9,096,635; 7,846,920 & 8,404,671**

Therapeutic Indication: Antibiotic

Mechanism of Action: Beta-lactam antibiotics

State of Technology: *In vitro*

Cell Infection Results



**Activity of New N-Acylated Ciprofloxacin Derivatives Against Facultative Intracellular Bacteria**

*A Novel Method Against Bartonella Henselae and Francisella Tularensis*

**USF Tech ID# 10A019**

**US Patent Number: 8,143,398**

Therapeutic Indication: Antibacterial

Mechanism of Action: Inhibition of DNA gyrase

State of Technology: *In vitro*

**γ-AApeptides as Novel Antimicrobial Peptidomimetics**

*Can be Used to Treat Clinically Relevant Strains of Resistant Microbes*

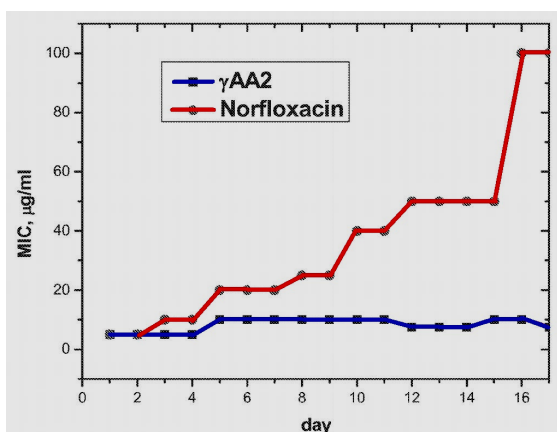
**USF Tech ID# 11B149**

**US Patent Number: 9,499,587; 10,144,764; 10,308,686**

Therapeutic Indication: Antibacterial, Antimicrobial

Mechanism of Action: Disruption of microbial protein-protein interactions

State of Technology: *In vitro*



CTX-M β-lactamase inhibitors can be used to target multi-drug resistant organisms.

**Inhibitors of CTX-M Beta-Lactamases for New Antibiotic Development**

*Novel Inhibitor Scaffolds Against CTX-M Beta-Lactamases that May be Used as the Basis for Developing New Antibiotics*

**USF Tech ID# 11B156**

**US Patent Number: 9,556,131**

Therapeutic Indication: Antibiotic development

Mechanism of Action: CTX-M β-lactamases

State of Technology: *In vitro*



Methicillin-resistant Staphylococcus aureus (MRSA)

**2,4-Diaminoquinazolines as Anti-Bacterials**

*Novel Antimicrobials Against Methicillin Resistant Staphylococcus Aureus*

**USF Tech ID# 12A036**

**US Patent Number: 8,906,918; 10,081,607**

Therapeutic Indication: Antimicrobial

Mechanism of Action: 2, 4 Diaminoquinazoline analogues  
Staphylococcal infections

State of Technology: *Preclinical*



**Novel Solutions for the Prophylaxis of Catheter-Related Bloodstream Infections**

*Heparin-Compatible Solution which Prevents and Treats Vascular Catheter-Related Bloodstream Infections*

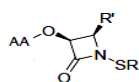
**USF Tech ID# 12A057**

**US Patent Number: 9,125,959; 9339574; 9,839,709**

Therapeutic Indication: Vascular catheter-related infections

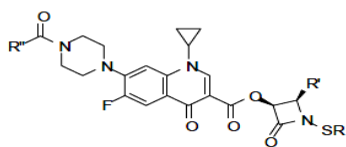
Mechanism of Action: An alternative alcohol preparation

State of Technology: *In vitro*



Structure A

AA = Antimicrobial



Structure B

R = CH<sub>3</sub>, sBu

R' = 2-CIPhR'' = CH<sub>3</sub>, pentyl, hexyl

**Multi-Action Antibiotic Prodrugs**

*Novel Antibiotic Compositions*

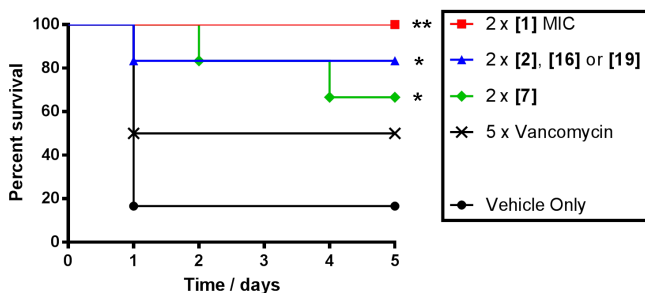
**USF Tech ID# 12B156**

**US Patent Number: 9,339,574; 10,010,545**

Therapeutic Indication: Bacterial infection

Mechanism of Action: Beta-lactamase inhibitor and antibiotic

State of Technology: *In vitro*



**Novel Antibacterial Agents**

*Antimicrobial Agents Effective Against ESKAPE Pathogens*

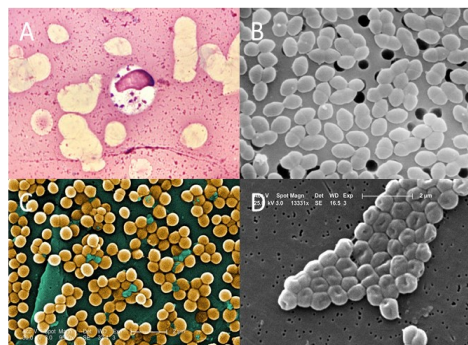
**USF Tech ID# 14A010**

**US Patent Number: 9,782,388; 10,052,309**

Therapeutic Indication: Anti-bacterial

Mechanism of Action: Inducing membrane stress and interfering with DNA repair pathways

State of Technology: *Preclinical*



A) *Leishmania donovani* B) *Enterobacte spp.* C) Methicillin-resistant *Staphylococcus aureus* D) *Acinetobacter*

**Anti-Infective Agents with Novel Chemical Scaffolds**

*A Series of New Compounds for the Potential Treatment of Leishmaniasis and ESKAPE Bacterial Pathogens*

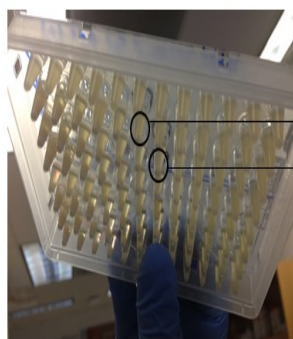
**USF Tech ID# 15A051**

**US Patent Number: 9,737,509**

Therapeutic Indication: Effective against *Leishmania donovani* and ESKAPE pathogens

Mechanism of Action: Hsp90 inhibitors

State of Technology: *In vitro*



MIC of C<sub>3</sub>ZnPs against co-culture of *E. coli* BAA-2471 and *E. faecium* 1449: 1.302 mg/mL  
 MIC of C<sub>1</sub>ZnPs against co-culture of *E. coli* BAA-2471 and *E. faecium* 1449: 0.781 mg/mL

Minimum Inhibitory Concentration (MIC) Test of synergism of Chitosan and ZnO against multidrug resistant fecal flora and their wild type counterparts.

**A Method of Mitigating Drug Resistant Bacteria**

*A Novel Invention to Mitigate Drug-Resistant Bacteria from Nosocomial Infections in Hospitals and in Food*

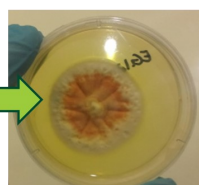
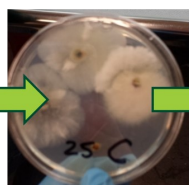
**USF Tech ID# 15A098**

**US Patent Number: 10,179,146**

Therapeutic Indication: Anti-microbial

Mechanism of Action: A combination of chitosan and ZnO

State of Technology: *In vitro*



Processing of *Phomopsis* sp. to extract antimicrobial compounds

**New Antimicrobials From an Epigenetics Based Fungal Metabolite Screening Program**

*Novel Antimicrobials Demonstrating Bioactivity Against L. Donovanii Parasite*

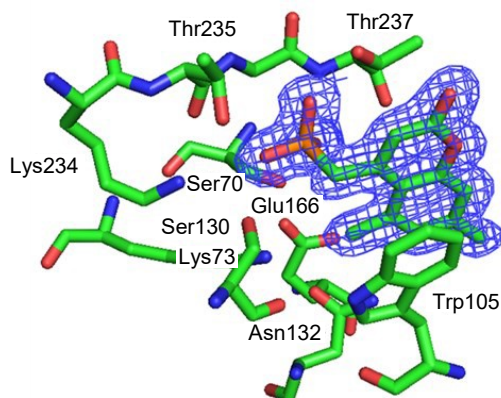
**USF Tech ID# 15B123**

**US Patent Number: 10,144,719; 10,358,431; 10,377,733**

Therapeutic Indication: Antimicrobial bioactivity against *L. donovani*

Mechanism of Action: Bioactivity of the *Phomopsis* sp. Fungus

State of Technology: *In vitro*



**Phophonate Compounds a Broad-Spectrum Beta-Lactamase Inhibitors**

*Broad Spectrum Beta-Lactamase Inhibitors*

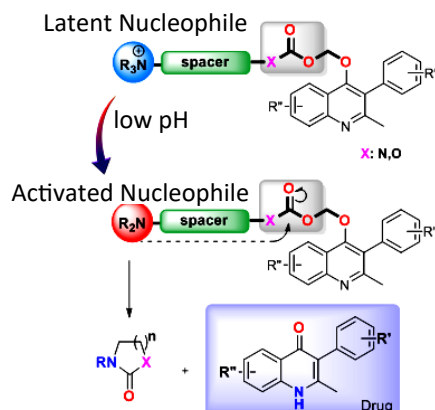
**USF Tech ID# 16A006**

**Patent Pending**

Therapeutic Indication: Bacterial Infection

Mechanism of Action: Beta-lactamase inhibitor

State of Technology: *In vitro*



**Prodrug Approach for 4(1H)-Quinolones and Similar Compounds to Improve Oral Bioavailability**

*Effective Prodrug Approach to Treat Malaria*

**USF Tech ID# 16A011**

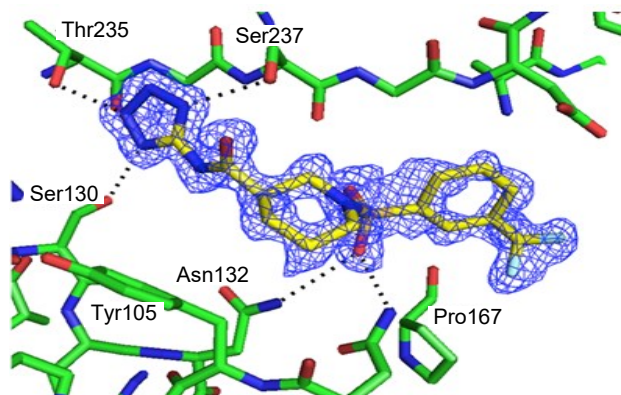
**Patent Pending**

Therapeutic indication: Prodrug approach for Malaria

Mechanism of action: Increases the aqueous solubility of ELQ-300 and other 4(1H)-quinolones

State of Technology: *In vivo*





**Tetrazole-Based Scaffolds as Broad-Spectrum Beta-Lactamase Inhibitors**

*Potent  $\beta$ -Lactamase Inhibitor*

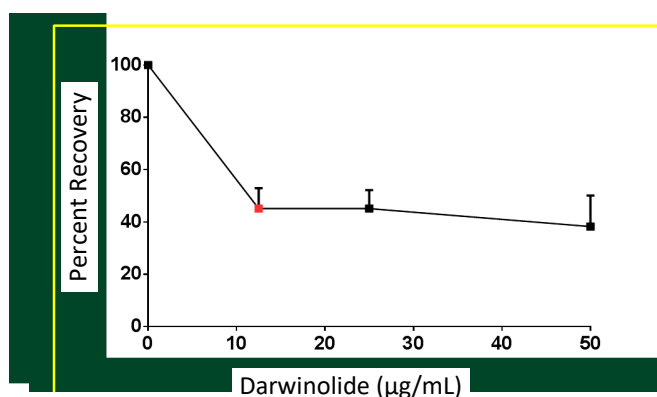
**USF Tech ID# 16A040**

**Patent Pending**

Therapeutic indication: Bacterial Infection

Mechanism of action: Beta-lactamase inhibitor

State of Technology: *In vitro*



**Darwinolide, A Selective Inhibitor of MRSA Biofilms from the Antarctic Sponge Dendrilla Membranosa**

*Novel Antibiofilm Agents for MRSA Treatment*

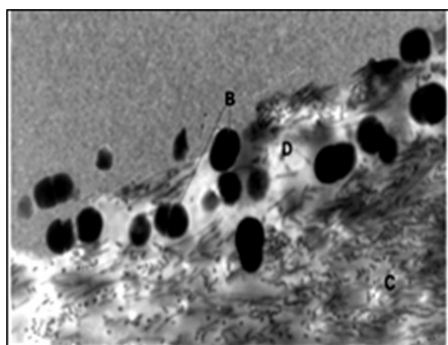
**USF Tech ID# 16A052**

**Patent Pending**

Therapeutic indication: Anti-biofilm-specific antibiotics

Mechanism of action: Inhibits MRSA biofilm

State of technology: *In vitro*



Migration of *S. mutans* through a section of placental tissue

**A Novel Vaccine Against Invasive Bacteria**

*The Activity of Bacterial Collagenase has Been Utilized to Develop a Novel Vaccine to Fight Against Streptococci Infection*

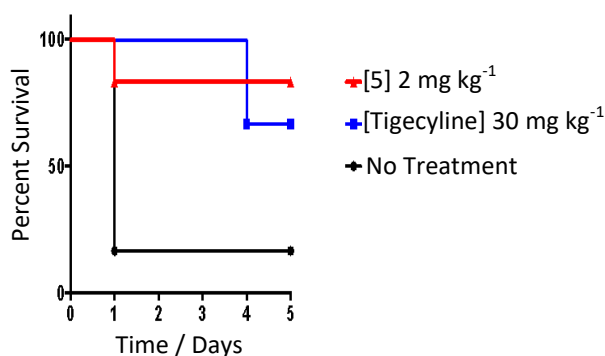
**USF Tech ID# 16A108**

**Patent Pending**

Therapeutic indication: Vaccine

Mechanism of action: Bacterial collagenase activity

State of Technology: *In vitro*



**Antimicrobial Activity of N2,N4-Disubstituted Quinazoline-2,4-Diamines towards Acinetobacter baumannii**

*Novel Quinazoline Compounds Exhibit Strong Antibacterial Activity Against Mult-Drug Resistant A. Baumannii*

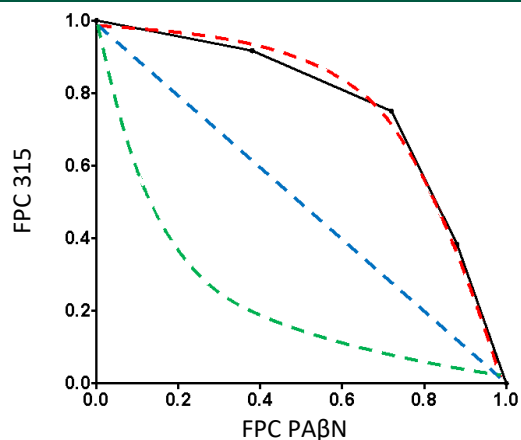
**USF Tech ID# 16B144**

**US Patent Number: 10,323,007**

Therapeutic Indication: A treatment against *Acinetobacter baumannii*

Mechanism of Action: Bactericidal Dihydrofolate Reductase Inhibitors

State of Technology: *In vivo*

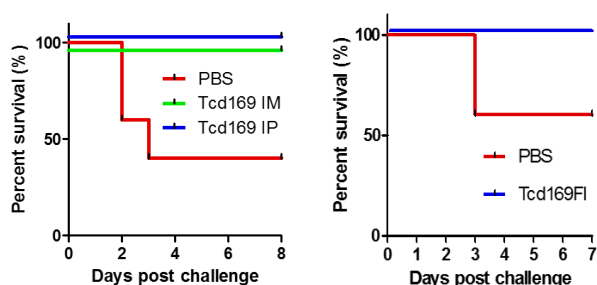


**The Development of Novel Anti-Resistance Agents Targeting the Efflux Pumps of Multi-Drug Resistant Bacterial Pathogens**

*Novel Inhibitors of Efflux Pumps of Bacterial Pathogens*

**USF Tech ID# 16B146**  
**Patent Pending**

Therapeutic Indication: Multidrug resistant bacterial pathogens  
Mechanism of Action: Efflux Pump Inhibitor  
State of Technology: *In vitro*



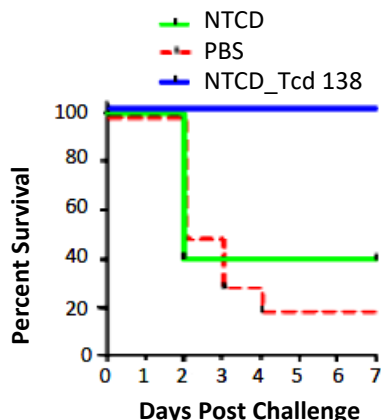
Immunization of animals with Tcd169 (intramuscular or intraperitoneal) or Tcd169FI (intramuscular) provides full protection against infection with a hypervirulent *C. difficile* strain.

**Multivalent Immunogens Against Clostridium Difficile**

*Three Multivalent Protein Vaccine Candidates for Clostridium Difficile Infection*

**USF Tech ID# 17A057**  
**Patent Pending**

Therapeutic Indication: Vaccine  
Mechanism of Action: The vaccines target both *C. difficile*'s method of infection and intrinsic toxin  
State of Technology: *In vivo*

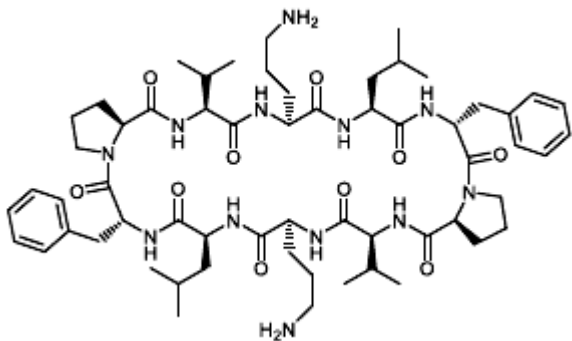


**Non-Toxigenic Clostridium Difficile Spores for Use in Oral Vaccination**

*Effective Against Both Clostridium Difficile Toxins and Colonies*

**USF Tech ID# 17A102**  
**Patent Pending**

Therapeutic indication: *C. difficile* vaccine  
Mechanism of action: Non-toxigenic *C. difficile* strains carrying toxin fragments  
State of Technology: *In vivo*



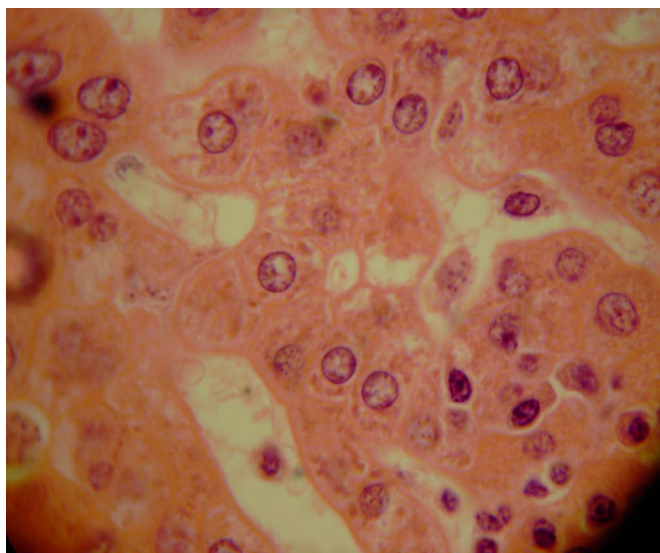
Gramicidin S.

**Antimicrobial Analogues of Gramicidin S**

*Synthesized Analogues of a Natural Product Gramicidin S*

**USF Tech ID# 18A083**  
**US Patent Number: 10,351,602**

Therapeutic indication: Anti-bacterial  
Mechanism of action: Gramicidin S analogues against gram positive and negative bacteria  
State of Technology: *In vitro*



A Leishmaniasis infection at the cellular level.

**Leishmania Inhibitors**

*A Metabolite for the Treatment of Leishmaniasis*

**USF Tech ID# 18B140**

**Patent Pending**

Therapeutic Indication: *Leishmania donovani* infections

Mechanism of Action: A metabolite derived from an Antarctic marine coral

State of Technology: *In vitro*

**Technology Description**

USF researchers have identified a novel metabolite derived from an Antarctic marine coral that shows promise as a new treatment option for leishmaniasis infections. Antarctic marine invertebrates are being investigated for their natural chemical protective mechanisms used against predators. This natural product chemistry is ideal for new drug development efforts. The identified metabolite has exhibited specific inhibition of *Leishmania donovani* parasites in laboratory settings. Furthermore, the compound also exhibited inhibition towards *Clostridium difficile* and HeLa cancer cells.

**Transfection Vector for Pathogenic Amoebae and Use Thereof**

*A Novel Genetic Tool to Discover Drug Targets*

**USF Tech ID# 17A009**

**US Patent Number: 10,273,487**

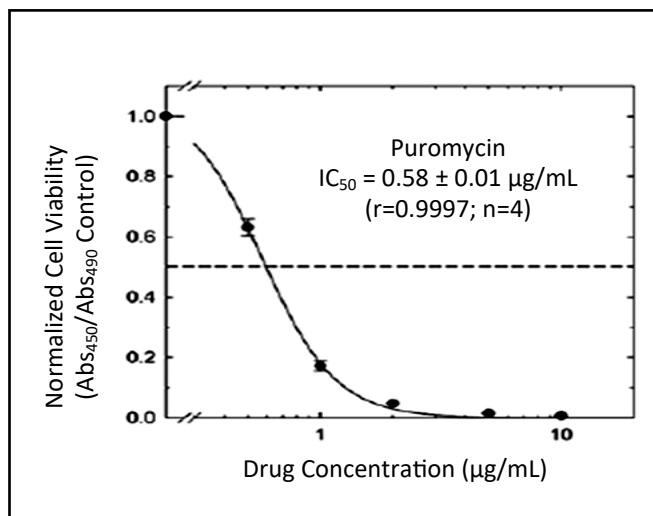
Therapeutic Indication: Vector for transfection

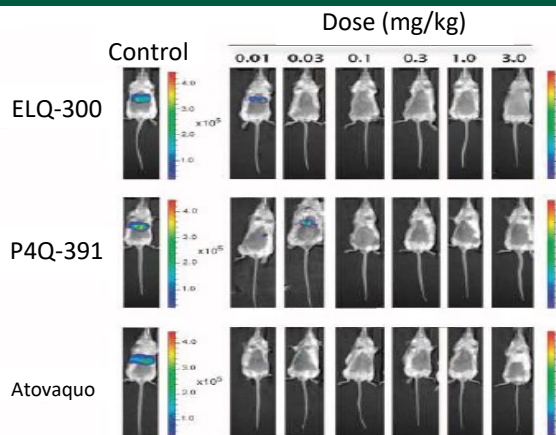
Mechanism of Action: Electroporation system as reverse genetic approach to unveil novel drug targets and virulence factors in amoebae

State of Technology: *In vitro*

**Technology Description**

Researchers at the University of South Florida have developed a transfection vector as a novel genetic tool for a reverse genetic approach to unveil virulence factors and potential drug targets within these microbes. Identification of three independent selectable markers, hygromycin, puromycin and bleomycin for *N. fowleri* would allow for multiple transfection rounds with different genes. Especially, after the protozoan parasite was found to have natural resistance to neomycin. Transfection of amoeba has been difficult and this innovative technology would be a solution.



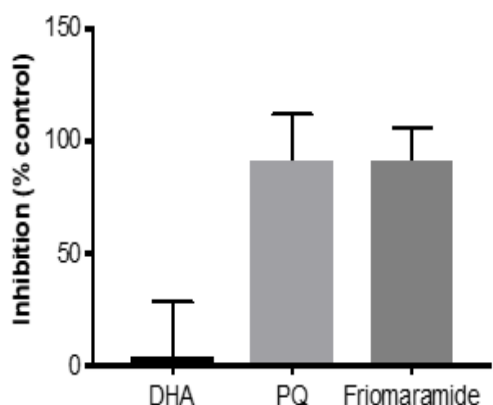


**Piperazino-Substituted 4(1H)-Quinolones Targeting Erythrocytic and Exoerythrocytic Stages of Malaria**  
*Optimized 4(1H)-Quinolones for Treatment of Malaria*

**USF Tech ID# 16A012**

**US Patent Number: 10,000,452**

Therapeutic Indication: Malaria  
 Mechanism of Action: Effective treatment that targets erythrocytic and exoerythrocytic stages of malaria  
 State of Technology: *In vivo*



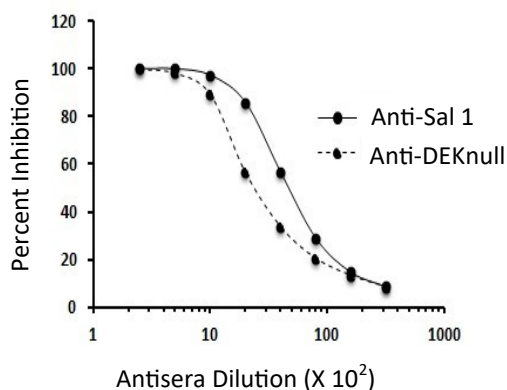
**Fromaramide, a Novel Hexapeptide, Inhibits Liver Stage Plasmodium Falciparum**

*Novel Treatment For Malaria that Bypasses Antimalarial Resistance*

**USF Tech ID# 16A012**

**US Patent Number: 10,000,452**

Therapeutic Indication: Malaria  
 Mechanism of Action: Hexapeptide targeting *Plasmodium Falciparum*  
 State of Technology: *In vitro*



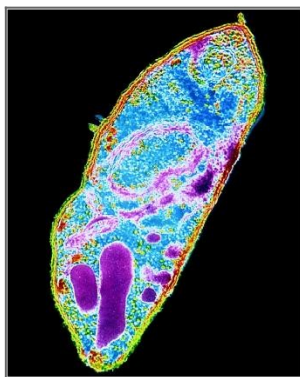
**Design and Immunogenicity of a Novel Synthetic Antigen of the Plasmodium**

*A Novel Synthetic Vaccine for Malaria*

**USF Tech ID# 11B116**

**US Patent Number: 8,784,832; 9,120,869**

Therapeutic Indication: Malaria  
 Mechanism of Action: Elicits an immune response directed against the blood stage of malarial parasite *Plasmodium vivax*  
 State of Technology: Preclinical



Plasmodium species

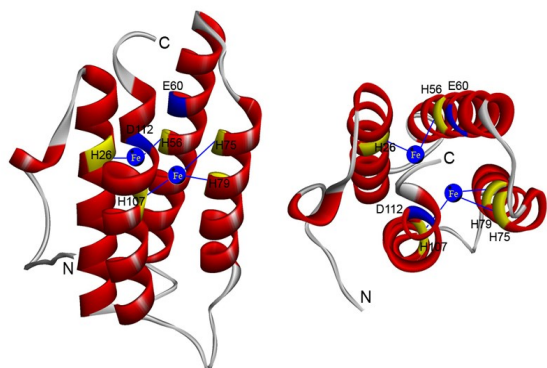
**4(1H)-Quinolones Having Anti-Malarial Activity with Reduced Chemical Resistance**

*Novel Compound Having Antimalarial Activity for Treatment and Prevention of the Disease*

**USF Tech ID# 11B171**

**US Patent Number: 8,877,752**

Therapeutic Indication: Malaria  
 Mechanism of Action: Effective inhibition/elimination of at least one of the stages of the malarial lifecycle  
 State of Technology: Preclinical



Molecular modeling of amoebic Nfa-1 virulence factors

**Inhibitors of Oxidase Virulence Factor Protect Against Pathogenic Amoebas**

*Inhibitors of Nfa-1 Protein for the Treatment and Prevention of Amoebic Infections*

**USF Tech ID# 14A014**

**US Patent Number: 9,492,455; 9,655,901; 10,058,517**

Therapeutic indication: Amoebic infections

Mechanism of action: Inhibits Nfa-1 protein found in pathogenic amoeba and *nigleria fowleri*

State of Technology: *In vitro*



**Treatment For the Disease Visceral Leishmaniasis**

*Novel Compounds Isolated from Antarctic Sponge Display Bioactivity Against Leishmania Donovanii*

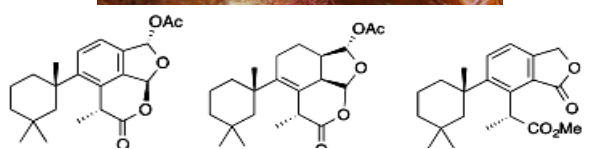
**USF Tech ID# 14B109**

**US Patent Number: 9,872,849**

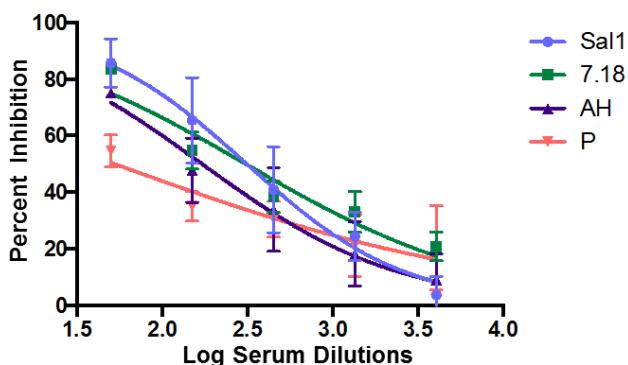
Therapeutic indication: Visceral Leishmaniasis

Mechanism of action: Selective inhibitors of *L. donovani*

State of Technology: *In vitro*



Aplysulphurin (1) Tetrahydroaplysulphurin (2) Membranolid A (3)



**Next Generation Plasmodium Vivax Vaccine**

*Synthetic Antigen-Based Vaccine for Malaria*

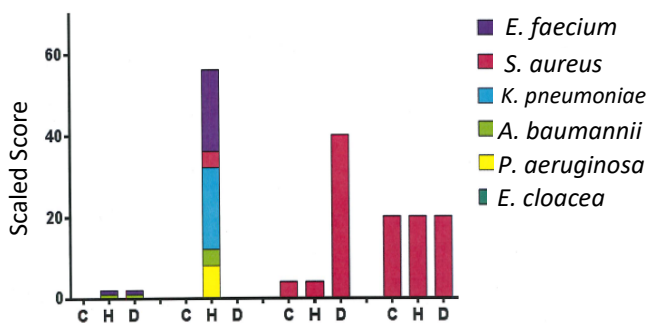
**USF Tech ID# 15B166**

**Patent Pending**

Therapeutic Indication: Malaria

Mechanism of Action: Elicits a broadly neutralizing immune response based on the ligand domain of *Plasmodium vivax*

State of Technology: *In vivo*



**Epigenetic Modification of Fungi and Uses Thereof**

*Anti-Leishmanial Dinorsestertepene from a Mangrove Endophytic Fungus*

**USF Tech ID# 18B137**

**Patent Pending**

Therapeutic Indication: *Leishmania donovani* infections

Mechanism of Action: A dinorsestertepene isolated from an endophytic fungus of a mangrove plant

State of Technology: *In vitro*

**Delta-9 Tetrahydrocannabinol as an Inhibitor of Herpes Viruses**

*Method of Treating Gamma Oncogenic Herpes Viruses*

**USF Tech ID# 04B089**

**US Patent Number: 8,697,095**

Therapeutic Indication: Herpes virus infection

Mechanism of Action: Inhibitor of gamma herpes virus replication

State of Technology: *In vitro*

**Technology Description**

Our scientists have determined that THC is an inhibitor of gamma herpes virus replication. THC prevented sudden reactivation of gamma herpes viruses in infected cells without cytotoxic effects on normal kidney cells. Furthermore, gamma herpes virus-infected cells died upon reactivation of the virus but survived when cultured with the cannabinoid compound, THC. The researchers showed that THC is selective for gamma herpes viruses with no effect on related viruses. Our scientists concluded that THC targets ORF50, a gene shared by gamma herpes viruses.

10 µg/mL THC      5 µg/mL THC      2.5 µg/mL THC



1.5 µg/mL THC      0.6 µg/mL THC      DMSO solvent



**Effective Therapeutics Against Viral Infections**

*Novel Stereospecific, Heterocyclic Compounds for Influenza*

**USF Tech ID# 07B120**

**US Patent Number: 8,318,804**

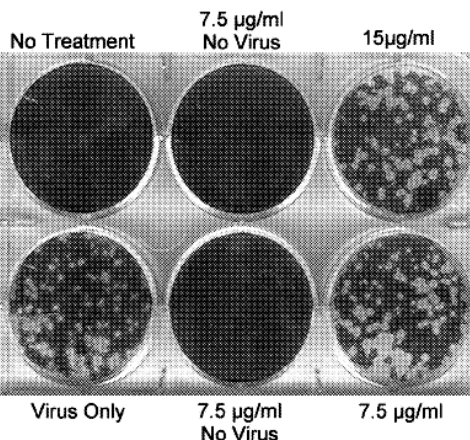
Therapeutic Indication: RSV infection

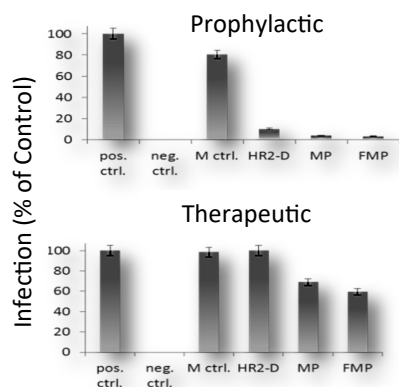
Mechanism of Action: Effectively treats cells infected by single-stranded RNA viruses

State of Technology: *In vitro*

**Technology Description**

Researchers at USF have developed methods of treating and preventing viral diseases with cyclic dienic ethers or derivatives thereof. This invention encompasses methods of synthesis of the compounds and their derivatives, which happen to share similar frameworks to anti-HIV and anticancer agents. These antiviral compounds may be utilized against both type A and type B influenza infections. In addition to its established antiviral potency, this invention includes compounds that can be potentially explored for the development of pharmaceutically active drugs against other disease causing microbes.





**Peptide for the Treatment of Respiratory Syncytial Virus Infection**

*Novel Micellar Nanoparticles with Inhibitor Peptides*

**USF Tech ID# 12B111**

**US Patent Number: 9,556,236**

Therapeutic indication: RSV Infection

Mechanism of action: Binding HR2 domain of RSV fusion protein

State of technology: *In vivo*



**Improved Immunogenicity for Attenuated Respiratory Syncytial Virus Vaccines**

*RSV Vaccines with Improved Immunogenicity*

**USF Tech ID# 14B139**

**Patent Pending**

Therapeutic Indication: RSV infection

Mechanism of Action: Increasing levels of type I and type III interferons

State of Technology: *In vivo*



Respiratory syncytial virus

**Antigenome Clone of Respiratory Syncytial Virus Subgroup B**

*Simple, Rapid Assay Test to Investigate Antiviral Therapies*

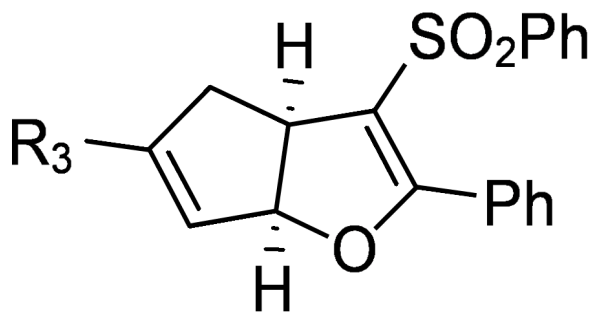
**USF Tech ID# 14B141**

**Patent Pending**

Therapeutic Indication: RSV diagnostic

Mechanism of Action: Antigenome cDNA for use in RSV reverse genetics to rapidly identify vaccinated individuals

State of Technology: *In vitro*



**Method for Synthesis of Effective Therapeutics Against Viral Infections**

*Novel Nitro-ester Compounds with Potent Anti-Viral Activity*

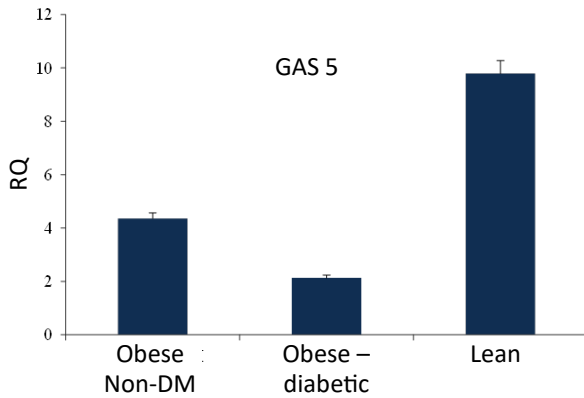
**USF Tech ID# 07B121**

**US Patent Number: 8,236,853**

Therapeutic Indication: RSV infection

Mechanism of Action: Contacting the cell having RSV infection with the novel compound effectively treated the cell

State of Technology: *In vitro*

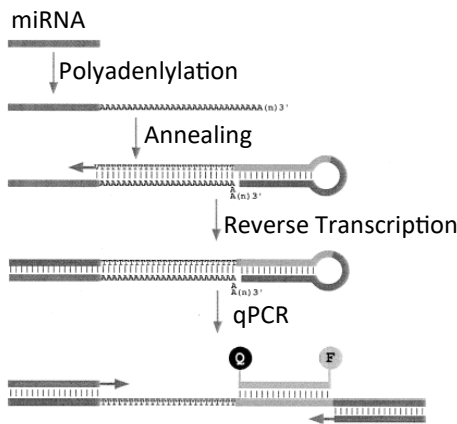


**GAS5 lncRNA Biomarker Signature for Prediction and Management of Diabetes**

Biomarker for Early Detection/Diagnosis of Pre-Diabetes and Diabetes Management

**USF Tech ID# 14B152**  
**Patent Pending**

Therapeutic Indication: Early diabetes detection  
 Mechanism of Action: GAS5: A RNA-based biofluid marker  
 State of Technology: *In vitro*

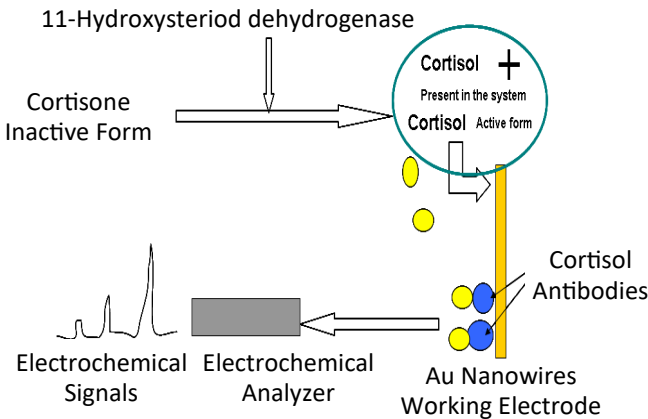


**A Method of Profiling MicroRNAs**

A Novel microRNA (miRNA) Quantification Method to Profile the Expression Levels of miRNAs Using an Universal Probe and an Universal RT-Primer (UPR)

**USF Tech ID# 10A016**  
**US Patent Number: 9,493,825**

Therapeutic Indication: RNA detection  
 Mechanism of Action: A universal probe and RT-primer  
 State of Technology: *In vitro*

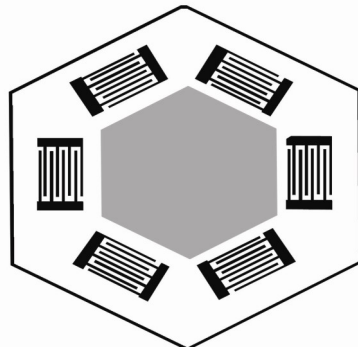


**Gold Nanowires Based Microfluidic Device for the Detection of Blood Analytes and Disease Biomarkers**

Ultra-Sensitive Detection of Analytes for Efficient Clinical Analysis

**USF Tech ID# 06A062**  
**US Patent Number: 8,349,604**

Therapeutic Indication: A microfluidic sensing device  
 Mechanism of Action: Ultra-sensitive detection of analytes such as cortisol and other biomarkers  
 State of Technology: *Prototype*



An illustration of Hexagonal Surface Acoustic Waves (SAW) Device Schematic.

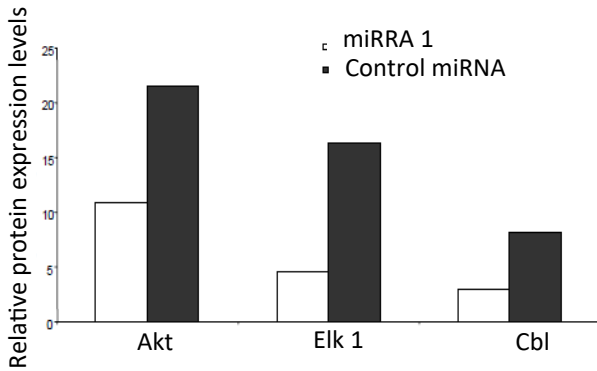
**Simultaneous Sample Manipulation and Sensing Using Surface Acoustic Waves**

Biomarker Detection for Diseases Using SAWs

**USF Tech ID# 07A008**  
**US Patent Number: 7,878,063**

Therapeutic Indication: Biomarker detection  
 Mechanism of Action: Removes nonspecifically bound proteins from the surface of biosensors  
 State of Technology: *Prototype*





**MicroRNAs Modulating Immunity and Inflammation**

*The Use of miRNAs to Alleviate Inflammatory and Cancerous Diseases*

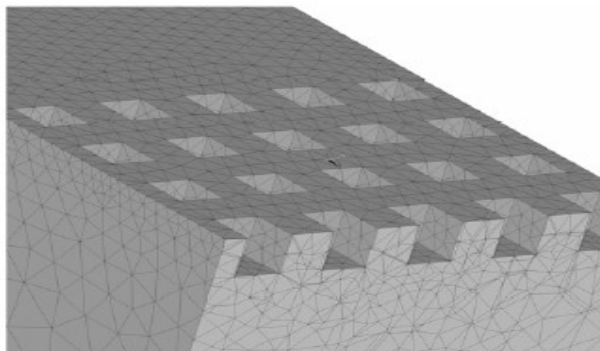
**USF Tech ID# 07A058**

**US Patent Number: 9,089,589 & 8,415,096**

Therapeutic Indication: Cancer diagnoses and therapeutics

Mechanism of Action: miRNA

State of Technology: *In vivo*



Meshed  $\lambda/2 \times \lambda/2 \times \lambda/2$  Micro-cavity SAW Device

**Micro-Activity Enhanced Surface Acoustic Wave Devices**

*Shear-Horizontal Surface Acoustic Wave Sensors for Better Sensitivity and Lower Power Consumption*

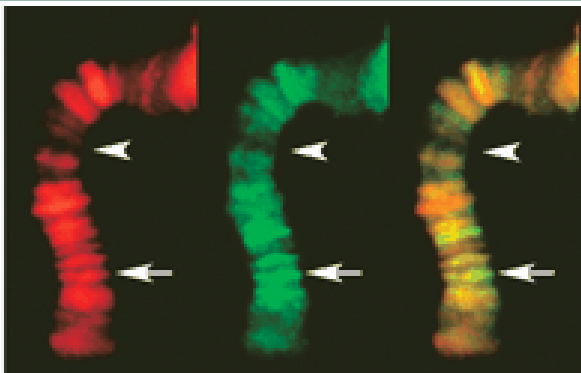
**USF Tech ID# 08A001**

**US Patent Number: 8,089,196**

Therapeutic Indication: Enhanced sensitivity and lower power consumption of surface acoustic wave devices

Mechanism of Action: Surface Acoustic Wave (SAW) devices

State of Technology: *Prototype*



The arrows are indicating the location of fusion genes by a microscopic method.

**Identification of DNA Segment Involved in Chromosome Rearrangements**

*A New Web Based Tool for Biomedical Researchers*

**USF Tech ID# 08A032**

**US Patent Number: 8,352,194**

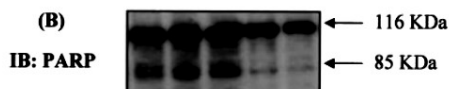
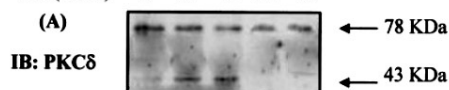
Therapeutic Indication: Cancer diagnostics and treatments

Mechanism of Action: Statistical analysis and associated algorithm

State of Technology: *In vitro*

pTracer/CMV PKC $\delta$ II	-	-	-	+	+
pTracer/CMV PKC $\delta$ I	-	+	+	-	-

RA (hours) 0 24 48 24 48



**PKC II Specific Polyclonal Antibody**

*Specific Antibodies to Two Isoforms of Protein Kinase C Delta (PKC $\delta$ )*

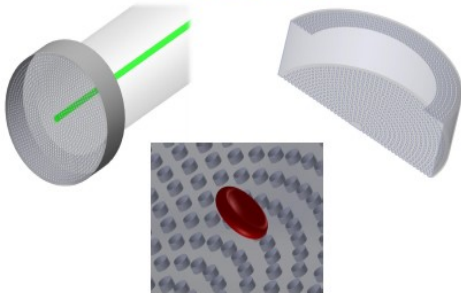
**USF Tech ID# 08B088**

**Patent Pending**

Therapeutic Indication: Neurogenesis and cancer

Mechanism of Action: Antibodies for PKC $\delta$  II

State of Technology: *In vitro*



**Left:** trimetric view of device with the fiber optic.  
**Middle:** a red blood cell (6-8µm), as compared to the membrane.  
**Right:** cross-sectional view of device.

**Hemolysis Sensor**

*A Sensor Capable of Detecting Hemolysis Levels in Whole Human Blood Samples*

**USF Tech ID# 12A091**  
**Patent Pending**

Therapeutic Indication: Analyses and quantitative measurements of blood samples  
 Mechanism of Action: Separation of plasma from whole blood for analysis  
 State of Technology: *Prototype*



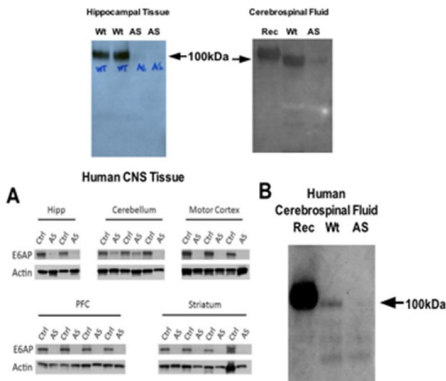
**Detecting Blood Coagulation On-Chip**

*A Low Cost Method to Determine the Speed of Blood Coagulation in Patients with Blood Clotting Disorders*

**USF Tech ID# 12B102**  
**US Patent Number: 9,297,816**

Therapeutic Indication: Medical devices for blood coagulation  
 Mechanism of Action: On-chip optical sensor based on back reflection  
 State of Technology: *Prototype*

**Rat and Human Tissue and CSF**



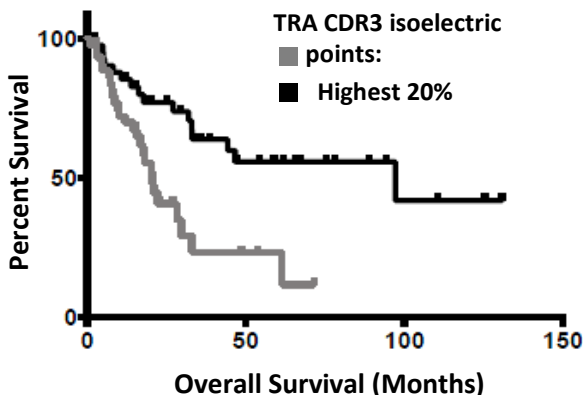
Analysis of human and Rat tissue and CSF showing the lack of the maternal UBE3A allele results in a marked reduction of protein

**Detection and Analysis of Cerebral Spinal Fluid Associated UBE3A**

*A Novel Method for Diagnosing Angelman Syndrome*

**USF Tech ID# 18B170**  
**Patent Pending**

Therapeutic Indication: Angelman Syndrome diagnostic  
 Mechanism of Action: UBE3A  
 State of Technology: *Clinical Samples*



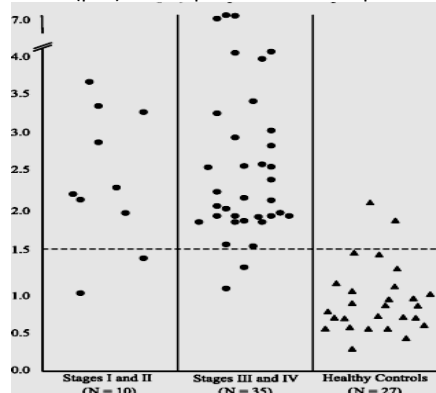
**TCR Mutant Peptide Complementarity Scoring for Therapies and Prognosis**

*A Bioinformatics Prediction Approach for Cancers with Mutant Tumor Peptide Activity*

**USF Tech ID# 18B177**  
**Patent Pending**

Therapeutic Indication: Method for cancer prognostics  
 Mechanism of Action: Bioinformatics  
 State of Technology: *Lab Tested*

Total LPA Levels ( $\mu\text{M}$ ) in Prospective Case Samples and Controls



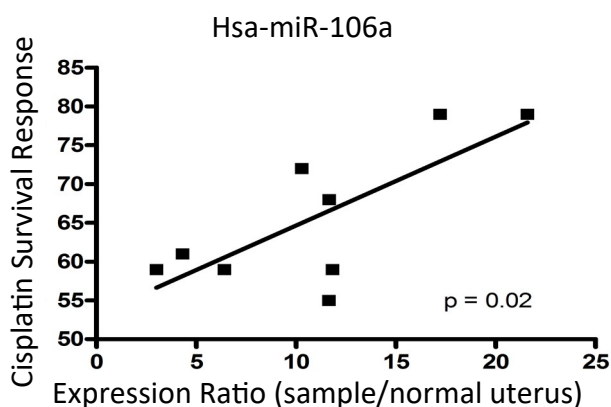
**Lysophosphatidylcholine Testing for Ovarian Cancer Recurrence**

*A Diagnostic and Screening Method to Identify Ovarian Cancer and Classification of the Early Stage*

**USF Tech ID# 03A035**

**US Patent Number: 7,964,408**

Therapeutic Indication: Early stage ovarian cancer identification  
 Mechanism of Action: Lysophospholipids as biomarkers  
 State of Technology: *Clinical samples*



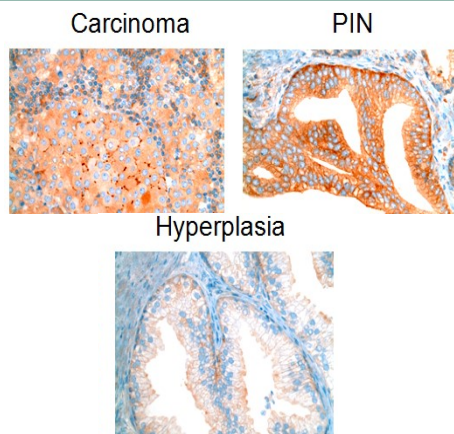
**Micro-RNA Profiles Associated with Endometrial Cancer Development and Response to Cisplatin and Doxorubicin Chemotherapy**

*A Method for Predicting Chemoresponse of a Population of Cancer Cells*

**USF Tech ID# 07A028**

**US Patent Number: 8,257,919**

Therapeutic indication: Chemotherapeutics  
 Mechanism of action: miRNA expression profile comparisons  
 State of Technology: *In vitro*



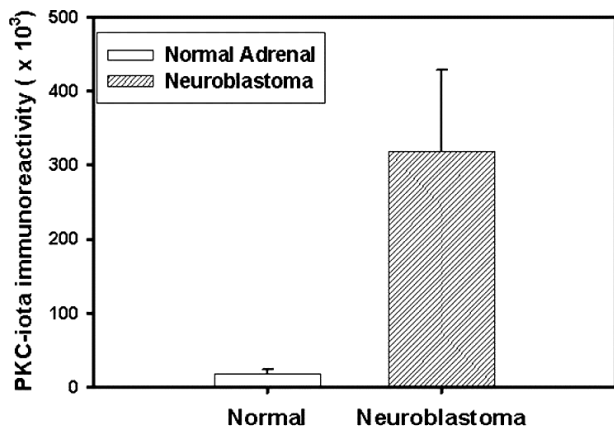
**Identification of Bif-1/Endophilin B1 as a Cancer Diagnostic Marker**

*Increased Bif-1 Protein Expression in High-Grade Prostatic Intraepithelial Neoplasia (PIN) in a Subset of Prostate Cancer*

**USF Tech ID# 07B105**

**US Patent Number: 8,309,311**

Therapeutic indication: Early state prostate cancer detection  
 Mechanism of action: Bif-1 expression  
 State of Technology: *In vivo*



**PKC-iota as a Predictor of Prostate Carcinogenesis**

*Methods for Detecting and Treating Prostate Tumorigenesis and Neuroblastoma with use of Protein Kinase C-iota (PKC-i)*

**USF Tech ID# 07B111**

**US Patent Number: 8,603,758; 9,078,915**

Therapeutic indication: Prostate and neuroblastoma treatment  
 Mechanism of action: Measurement of PKC-i levels with Western Blot  
 State of Technology: *Clinical samples*



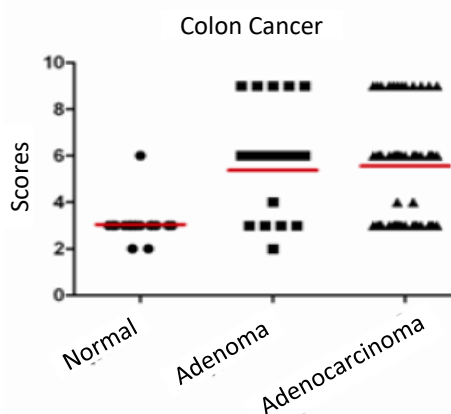
**Salivary Biomarkers Associated with Glycemic Control and Oral Health**

*Increased Salivary Inflammation Burden is Associated with Decreased Glycemic Control and Oral Health*

**USF Tech ID# 13B141**

**US Patent Number: 9,753,041**

Therapeutic Indication: Glucose screening methods  
 Mechanism of Action: Saliva analysis  
 State of Technology: *Clinical samples*



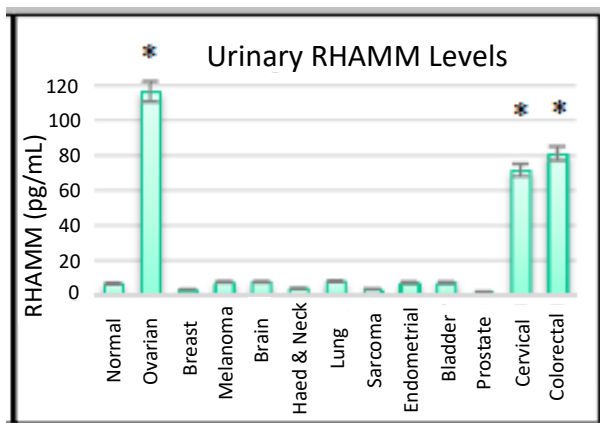
**Natriuretic Peptide Receptor as a Biomarker for Cancer**

*NPRA Can be Considered as a Progression Marker for Breast and Prostate Cancer*

**USF Tech ID# 10A015**

**US Patent Number: 10,184,942**

Therapeutic indication: Breast and prostate cancer detection  
 Mechanism of action: Natriuretic peptide receptor A  
 State of Technology: *In vitro*



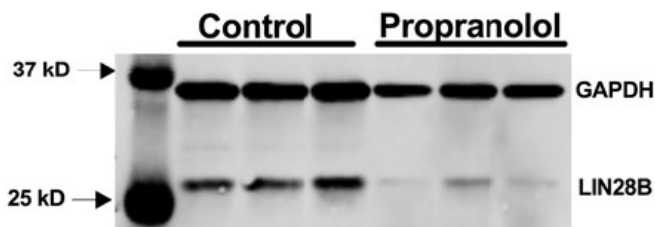
**Detection of Ovarian Cancer by Elevated Urinary Levels of Rhamm**

*Detects Ovarian Cancer in Early and Late Stages*

**USF Tech ID# 16A034**

**Patent Pending**

Therapeutic indication: Ovarian cancer detection  
 Mechanism of action: Urinary RHAMM levels  
 State of Technology: *Clinical samples*



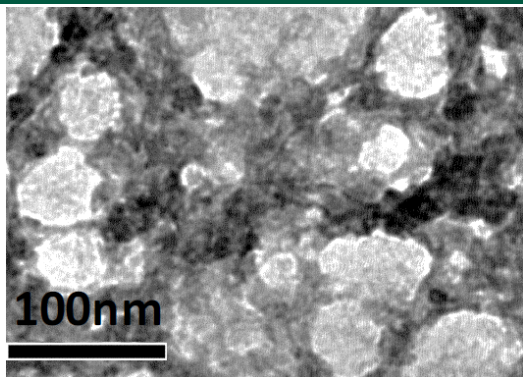
**LIN28B as Biomarker Propranolol Sensitive Tumors**

*A Newly Identified Mechanism by which Propranolol Induces Infantile Hemangioma Involution*

**USF Tech ID# 17B156**

**Patent Pending**

Therapeutic indication: Infantile hemangioma treatment  
 Mechanism of action: Modulation of LIN28B/Let-7 signaling by propranolol  
 State of Technology: *In vitro*

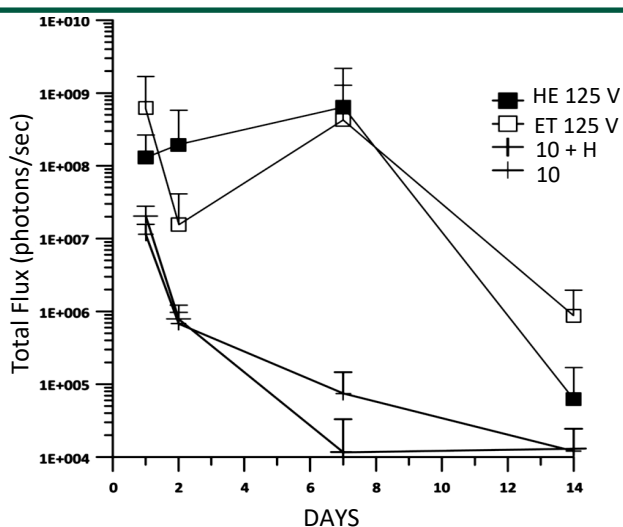


**Method of Delivering Genes and Drugs to a Posterior Segment of an Eye**

*Nanoformulations to Deliver Drugs and Genes to the Posterior Eye*

**USF Tech ID# 18B149**  
**Patent Pending**

Therapeutic Indication: Nanoformulations for optic drug delivery  
Mechanism of Action: Effective and non-invasive topical administration  
State of Technology: *In vivo*



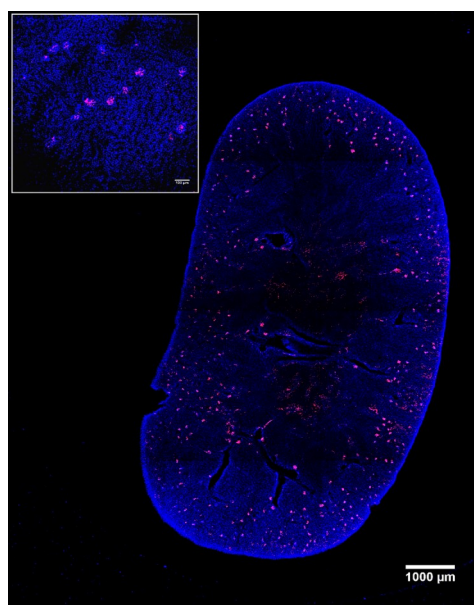
**Targeted Delivery of Molecules Using Impedance-Based Monitoring at Elevated Temperatures**

*Method of Thermal Assisted in Vivo Gene Electro-Transfer for Drug Delivery*

**USF Tech ID# 17B182**  
**Patent Pending**

Therapeutic Indication: Therapeutic delivery  
Mechanism of Action: Thermal assisted electroporation  
State of Technology: *In vitro*

\*Gene expression resulting from TAGET pulses with heat (HE 125V) and without heat (ET 125V) vs. injection with heat (IO+T) and without heat (IO).



**Nanoparticle Delivery System for Diseases Associated with Major Basement Membrane Components of Blood Vessels Accessible from the Blood Stream**

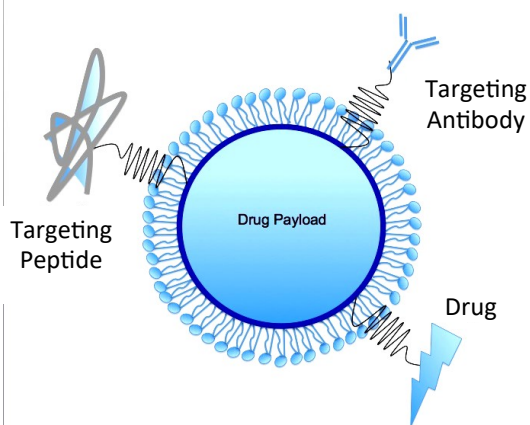
*Perfluorocarbon Nanoparticles for Drug Delivery and Early Detection Methods*

**USF Tech ID# 18A112**  
**Patent Pending**

Therapeutic Indication: Drug-delivery system that targets the basement membrane  
Mechanism of Action: Perfluorocarbon nanoparticles  
State of Technology: *In vivo*

**Technology Description**

Collagen IV is expressed in the glomerular basement membrane, which is the only site in the body that collagen IV has direct contact with blood via fenestrated capillary endothelium. USF inventors have formulated the collagen IV targeted PFC nanoparticles with amine-carboxyl coupling to a collagen IV targeting peptide. Furthermore, they have demonstrated that: 1) the collagen IV targeted PFC nanoparticles selectively bind to collagen IV coated surface as well as collagen IV in mesangial cells in vitro; 2) fluorescent signals are detected exclusively in glomeruli at 24 hours after i.v. injection of the collagen IV targeted PFC nanoparticles labeled with rhodamine; 3) loading of prednisone in the collagen IV targeted PFC nanoparticles is possible and quantifiable with high-performance liquid chromatography (HPLC).



**Nanoparticles to Enhance Antibiotic Delivery and Performance**

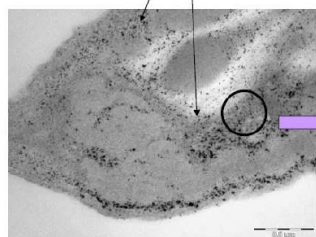
*Polyacrylate Nanoparticles for The Delivery of Antibiotics*

**USF Tech ID# 06A053**

**US Patent Number: 8,110,678; 8,470,958**

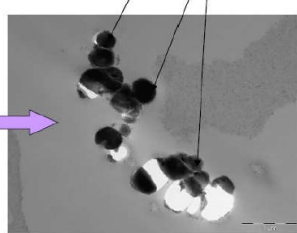
Therapeutic Indication: Encapsulation of antibiotics  
 Mechanism of Action: Microemulsion polymerization as a means to easily prepare aqueous solutions  
 State of Technology: *Compositions*

Nanoparticles inside the lungs



Nanoparticles in lungs

Nanoparticles



Enlarged view of nanoparticles inside the lungs

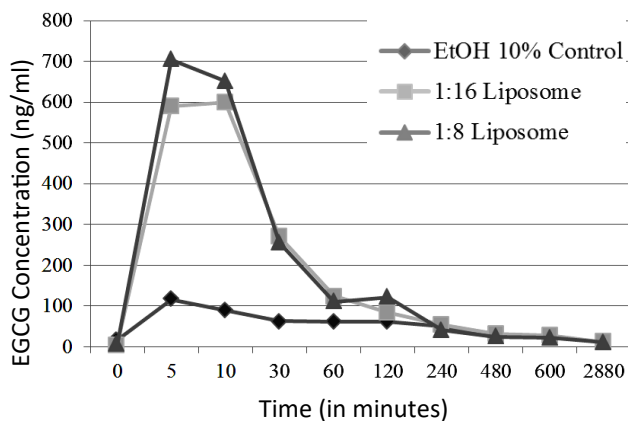
**Targeted Drug Delivery to Lungs**

*Sertoli Cells as Carriers of Anti-Cancer Drugs*

**USF Tech ID# 08A011**

**US Patent Number: 9,161,901; 10,272,053**

Therapeutic Indication: Encapsulation of anticancer medicine  
 Mechanism of Action: Sertoli cells have the ability to self-immunoprotect, thus can be introduced intravenously to the host without rejection  
 State of Technology: *In vivo*



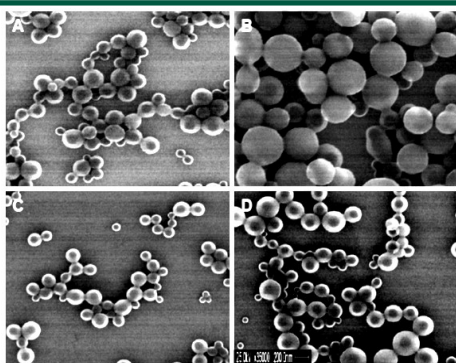
**Liposomal Nanoparticle Encapsulation Improves Bioavailability of Epigallocatechin-3-Gallate (EGCG)**

*Improving the Bioavailability of EGCG for Alzheimer's and HIV-Associated Dementia*

**USF Tech ID# 09A045**

**US Patent Number: 8,906,414**

Therapeutic Indication: Alzheimer's Disease and HIV-associated dementia  
 Mechanism of Action: EGCG effectively modulates amyloid precursor protein  
 State of Technology: *In vivo*



SEM micrographs of the Poly (Vinyl Benzoate) Nanoparticles

**Poly (Vinyl Benzoate) Nanoparticles for Molecular Delivery**

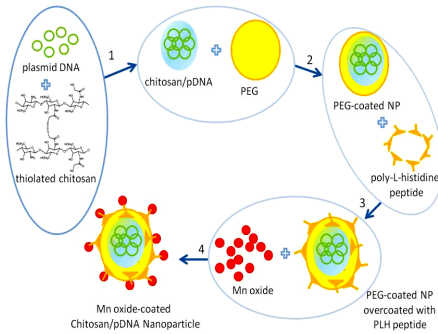
*Biodegradable Nanoparticles as Molecular Carriers*

**USF Tech ID# 10B116**

**US Patent Number: 9,433,581**

Therapeutic Indication: Molecular delivery of antibiotics  
 Mechanism of Action: Pluronic F68  
 State of Technology: *In vitro*

Mn Oxide Coated nanoparticles for the delivery of genes and siRNA into the brain by nasal insufflation.



**Manganese Oxide-Coated Nanoparticles for Delivery of Genes and siRNA into Brain**

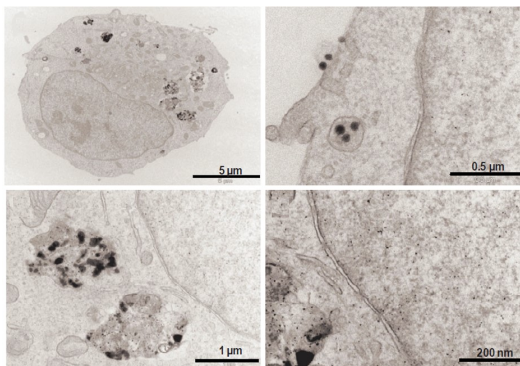
*Nasal Drug Delivery Directly to the Brain*

**USF Tech ID# 11A020**

**US Patent Number: 9,375,400; 9,938,526**

Therapeutic Indication: Delivery of therapeutic genes to the CNS  
 Mechanism of Action: Mn oxide-coated nanoparticle utilizes the capacity of manganese to be taken up by nerve terminals

State of Technology: *In vivo*



TEM images showing uptake and intracellular distribution of 4M-NPs:DNA.

**Multilayered Multimodal Magnetic Micelles Nanoparticles (4M-NPs) for MRI and Gene Delivery**

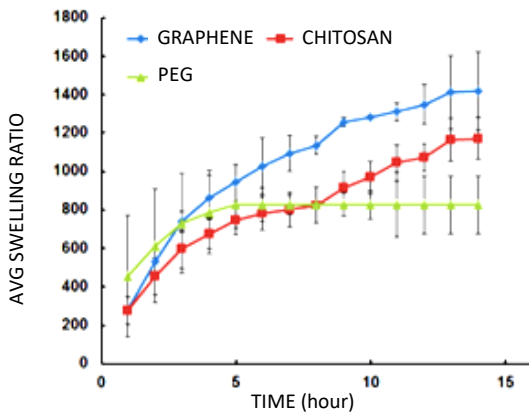
*Theranostics Approach to Treat Diseases*

**USF Tech ID# 11B152**

**US Patent Number: 9,439,978**

Therapeutic Indication: Cancer-tumor cells  
 Mechanism of Action: Super paramagnetic iron oxide nanoparticles

State of Technology: *In vitro*



**Graphene Hydrogel Matrix for the Differentiation of Mesenchymal Stem Cells**

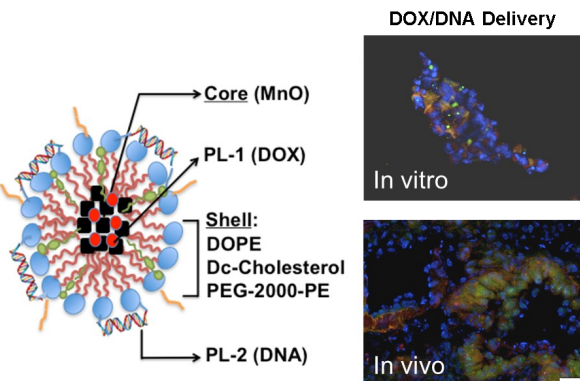
*Biocompatible Three-Dimensional Matrix*

**USF Tech ID# 12A022**

**US Patent Number: 9,433,682; 9,434,926**

Therapeutic Indication: Matrix for monitoring stem cell viability  
 Mechanism of Action: Stem cells differentiate into chondrocytes, osteocytes and adipocytes on hydrogels

State of Technology: *In vivo*



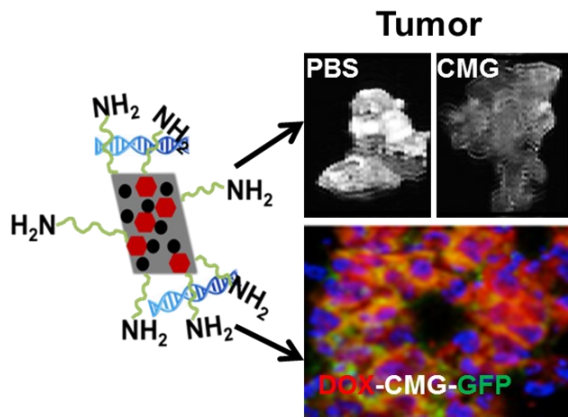
**Manganese Oxide Lipid Nanoparticles for Use as a T1 MRI Contrast Agent and Gene Delivery Agent**

*Novel Theranostics for Lung Disease*

**USF Tech ID# 12A024**

**Patent Pending**

Therapeutic Indication: Lung cancer  
 Mechanism of Action: Manganese oxide lipid nanoparticles  
 State of Technology: *In vitro*



**Graphene Based Theranostics for Tumor Targeted Drug/ Gene Delivery and Imaging**

*Multifunctional System for the Treatment and Diagnosis of Cancer*

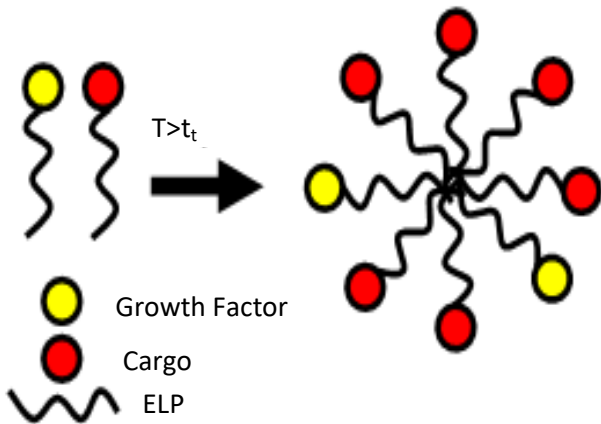
**USF Tech ID# 13A032**

**US Patent Number: 9,675,714**

Therapeutic Indication: Cancer tumor cells

Mechanism of Action: Imaging and treatment with graphene nanoparticles

State of Technology: *In vitro*



**A Platform for Selective Intracellular Delivery by the Growth Factor Mediated Macropinocytosis Pathway**

*Flexible and Selective Intracellular Delivery*

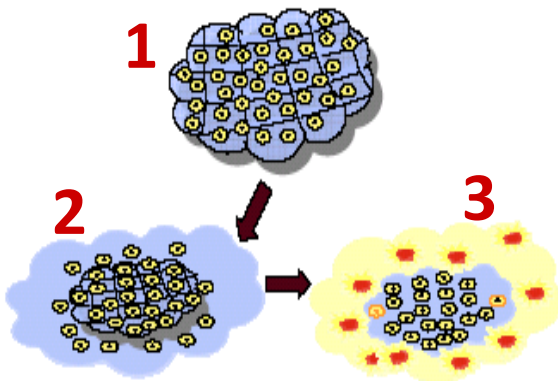
**USF Tech ID# 13B158**

**US Patent Number: 9,616,138**

Therapeutic Indication: Delivery of therapeutic proteins and genes

Mechanism of Action: Selective targeting of receptors that are overexpressed in tumors

State of Technology: *In vitro*



**New Drug Delivery System: Niosomes Encapsulating Drugs in a Hydrogel**

*For Optimal Drug Bioavailability*

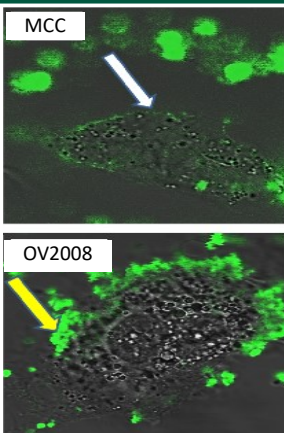
**USF Tech ID# 06A010**

**Patent Pending**

Therapeutic Indication: Drug delivery matrix

Mechanism of Action: Surfactant vesicles

State of Technology: *In vitro*



Greater specific interaction between hydrogel (green) and ovarian carcinoma (OV2008) was exhibited compared to normal ovarian cells (MCC).

**Enhanced Targeted Drug Delivery System Via Chitosan Hydrogel and Chlorotoxin**

*A Drug Delivery System that Allows the Tumor-Targeting Drug Chlorotoxin to be Entrapped Internally*

**USF Tech ID# 14A034**

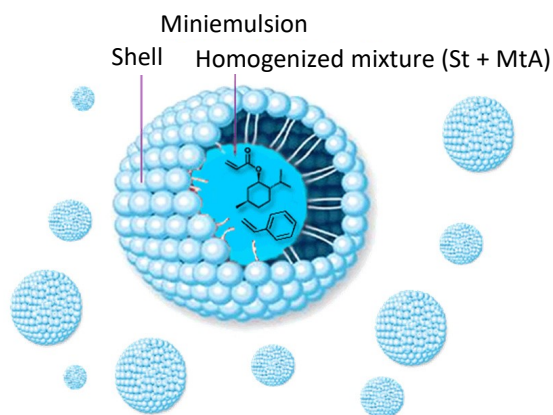
**US Patent Number: 9,522,114**

Therapeutic Indication: Cancer treatment

Mechanism of Action: Nanoparticle vesicles embedded in a chitosan hydrogel

State of Technology: *In vitro*

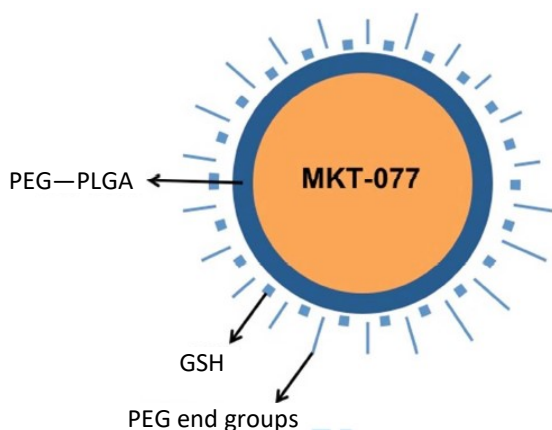




**Menthol-Based Nanoparticles for Drug Delivery**  
*Chiral Drug Delivery Vehicles*

**USF Tech ID# 14A062**  
**US Patent Number: 9,533,051**

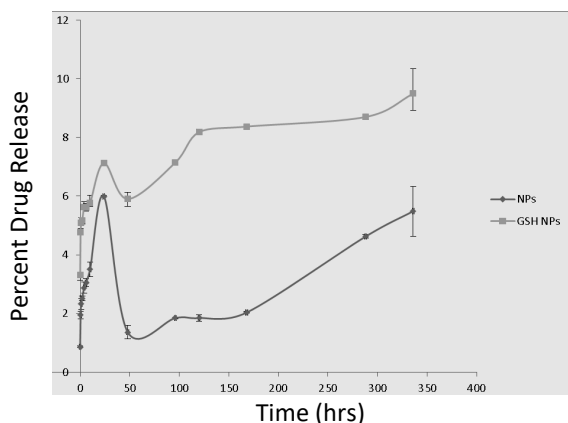
Therapeutic Indication: Drug delivery against infections  
Mechanism of Action: Menthol-based polyacrylate nanoparticles  
State of Technology: *In vitro*



**Novel MKT-077 Nanoparticles for Treatment of Alzheimer's Disease, Neurodegenerative Diseases, and Cancer**  
*Nanoparticles that can Overcome the Renal Toxicity and BBB Transport Issues Associated with Drug Delivery to the Brain*

**USF Tech ID# 14B120**  
**Patent Pending**

Therapeutic Indication: Neurodegenerative disease and cancer treatment  
Mechanism of Action: MKT-077 nanoparticles that can transport a drug through the BBB  
State of Technology: *In vitro*

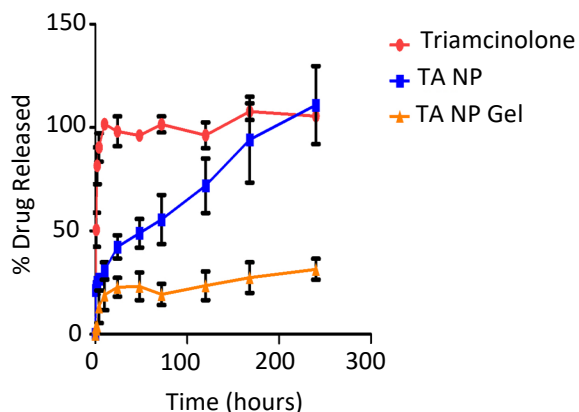


**Afobazole Nanoparticles Formulation for Enhanced Therapeutics**

*A Novel Nanoparticle Formulation of the Drug Afobazole with Blood Brain Barrier Permeability*

**USF Tech ID# 14B134**  
**US Patent Number: 10,172,867**

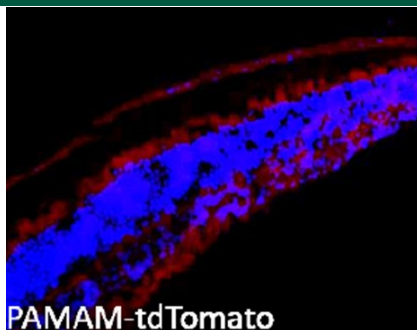
Therapeutic Indication: Diseases of the CNS  
Mechanism of Action: A nanoparticle carrier encapsulating afobazole  
State of Technology: *In vitro*



**Triamcinolone Acetonide Nanoparticles in Thermoreversible Gels for Enhanced Therapeutics**  
*A Novel Treatment for Age-Related Macular Degeneration*

**USF Tech ID# 15A101**  
**Patent Pending**

Therapeutic Indication: Age related macular degeneration treatment  
Mechanism of Action: A loteprednol etabonate-encapsulated PEGylated PLGA nanoparticle based drug delivery system  
State of Technology: *In vitro*



Topically applied nanoparticles resulted in expression of RFP in the posterior eye including retinal epithelium, suggesting they do reach retinal epithelium and retinal cells.

**Method of Delivering Genes and Drugs to a Posterior Segment of an Eye**

*Payload Delivery to the Retina*

**USF Tech ID# 18B149**

**Patent Pending**

Therapeutic Indication: Treatment of ocular diseases

Mechanism of Action: Nanoformulation for non-invasive and topical method of delivery

State of Technology: *In vitro*

**Formulation and Characterization of a Nano-particle Drug Delivery System Containing Digoxin and Corticosteroids**

*A Dual Drug Delivery System*

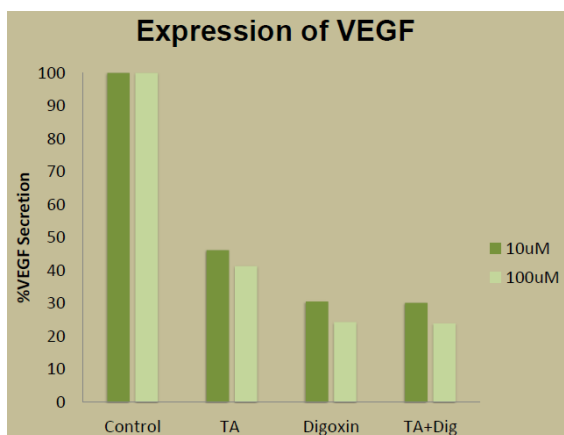
**USF Tech ID# 17A036**

**Patent Pending**

Therapeutic Indication: Treatment of posterior segment ocular diseases

Mechanism of Action: Anti-HIF agent digoxin and corticosteroid Triamcinolone Acetonide

State of Technology: *In vitro*



**Ciprofloxacin-Based Polyacrylate Nanoparticle Emulsions for Antibiotic Applications**

*Drug Delivery and Protection of Antibiotic Agents from Enzymatic and Chemical Degradation*

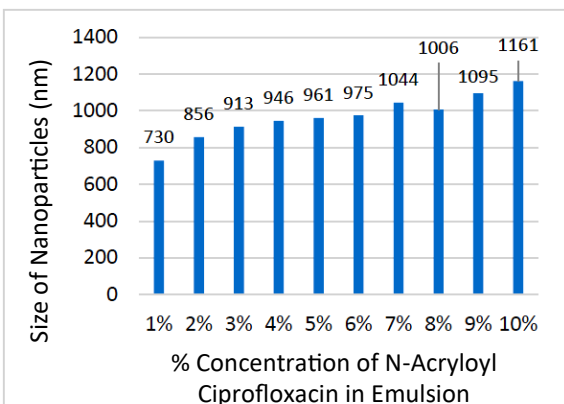
**USF Tech ID# 17B159**

**Patent Pending**

Therapeutic Indication: Antibiotic applications

Mechanism of Action: A bioactive antibacterial homopolymer nanoparticle

State of Technology: *In vitro*



**Materials and Methods to Reduce LDL Cholesterol**

*Functionalized Magnetic Nanoparticles with an Enzyme and an LDL Antibody*

**USF Tech ID# 06B094**

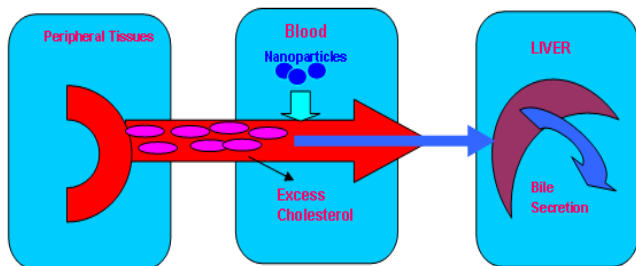
**US Patent Number: 8,414,926**

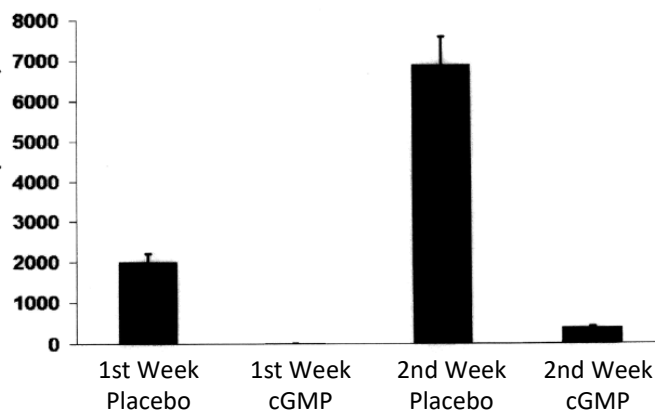
Therapeutic Indication: High cholesterol

Mechanism of Action: LDL conjugated nanoparticles that bind with LDL cholesterol

State of Technology: *In vivo*

Reverse Cholesterol Transport with Modified Nanoparticles





**Methods of Treatment: with Cyclic GMP**  
*Effectively Inhibits Human Cancer Growth in Athymic Mice*

**USF Tech ID# 04B068**  
**US Patent Number: 8,759,317; 9,808,513**

Therapeutic Indication: Pancreatic, breast, prostate, lung  
 Mechanism of Action: Interferes with DNA synthesis  
 State of Technology: *In vitro and in vivo mouse data*

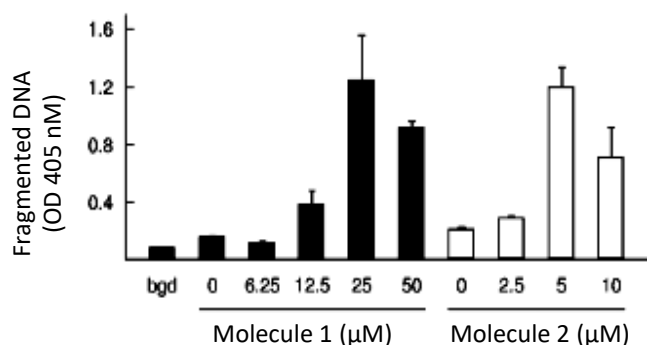


DNP is isolated from the venom of the green mamba snake.

**Methods of Treatment with Dendroaspsis Natriuretic Peptide**  
*Treats Aggressive Cancer w/o Chemotherapeutic Side Effects*

**USF Tech ID# 06B082**  
**US Patent Number: 7,825,092**

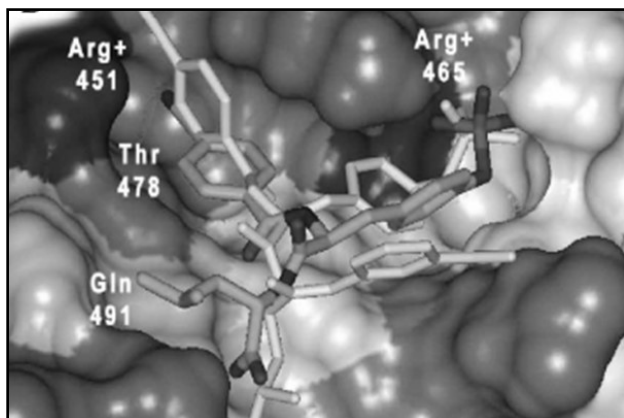
Therapeutic Indication: Solid malignancies including glioblastoma  
 Mechanism of Action: Interferes with DNA synthesis-isolated from the venom of the Green Mamba snake  
 State of Technology: *In vitro and in vivo mouse data*



**Prostate Cancer Therapy and Sensitivity Prediction**  
*Cyclin-Dependent Kinase Inhibitors (CDKI) Induce Apoptosis of Prostate Cancer Cells*

**USF Tech ID# 04B114**  
**US Patent Number: 9,063,142; 8,716,299**

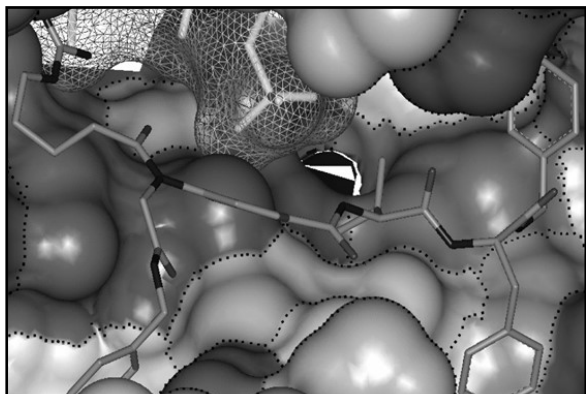
Therapeutic Indication: Prostate cancer  
 Mechanism of Action: Targets cancer cells by mediating P53 and XIAP proteins  
 State of Technology: *In vitro*



**SH2 STAT3/STAT1 Peptidomimetics as Novel Anticancer Drugs**  
*Comprehensive Series of Phosphopeptidomimetic Probes that Display Selective Inhibition of Specific STAT Isoform Homodimerization*

**USF Tech ID# 06B135**  
**US Patent Number: 8,153,596**

Therapeutic Indication: All cancer types  
 Mechanism of Action: Disruption of STAT proteins  
 State of Technology: *Compositions*



A computer illustration of the Akt substance binding region.

**Substrate Mimetic Inhibitors of Akt as Anticancer Drugs**  
*Oncogenic Prevention and Treatment Using Substrate Inhibitors to Block the Effects of the Akt Protein*

**USF Tech ID# 06B137**

**US Patent Number: 8,822,524; 9,453,049; 9,896,668**

Therapeutic Indication: All cancer types

Mechanism of Action: Akt Protein Inhibition

State of Technology: *Compositions*



The Antarctic tunicate, *Synoicum adareanum*

**Compositions: Palmerolide A Cytotoxic Macrolides**  
*Structural Recognition of STAT SH2 Domains*

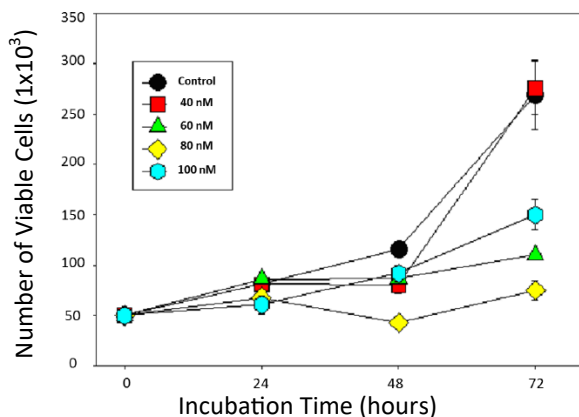
**USF Tech ID# 04A002**

**US Patent Number: 7,625,885; 8,669,376; 9,394,270**

Therapeutic Indication: Melanoma

Mechanism of Action: Inhibition of V-ATPase at nm concentrations

State of Technology: *In vitro*



**Methods of Treatment: Novel Therapeutic Target**  
*Targets Protein Kinase C iota in Cancer*

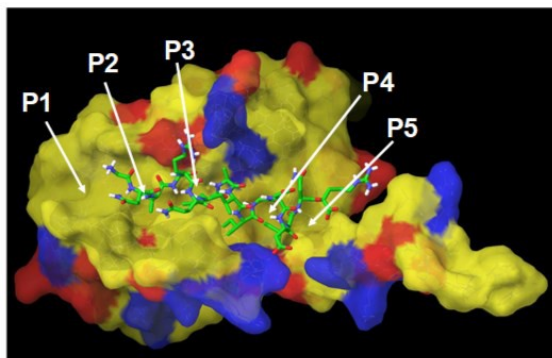
**USF Tech ID# 07B094**

**US Patent Number: 8,461,192**

Therapeutic Indication: Neuroblastoma, glioma, breast cancer

Mechanism of Action: Blocks catalytic activity of protein kinase C-iota

State of Technology: *Clinical samples*



Natural protein bak (green) binds to target protein Bcl-xL (yellow)

**Compositions: Modulating Bcl-2 Proteins**  
*Tumor Selective Apoptosis Inducing Agents*

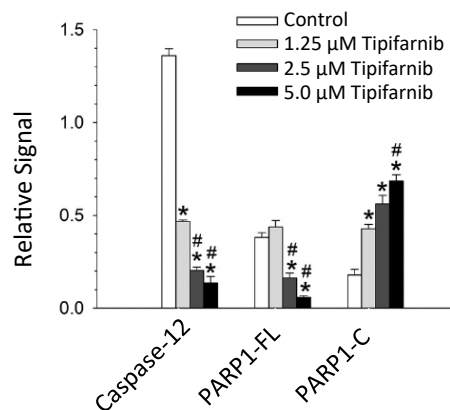
**USF Tech ID# 08A013**

**US Patent Number: 8,524,947**

Therapeutic Indication: Multiple cancer types

Mechanism of Action: Specifically targets Bcl-x<sub>L</sub> and triggers apoptosis

State of Technology: *In vitro modeling*

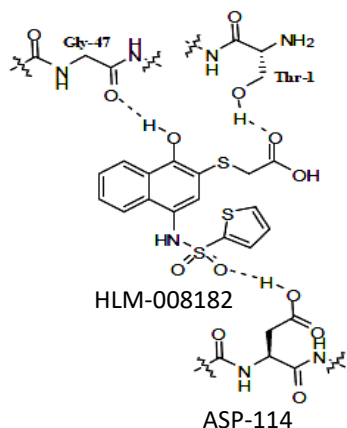


**Methods of Treatment with Tipifarnib**  
*Evokes ER Stress*

**USF Tech ID# 08B089**

**US Patent Number: 8,362,033**

Therapeutic Indication: All cancer types  
Mechanism of Action: Stimulates calcium channel Orai3  
State of Technology: *In vitro modeling*

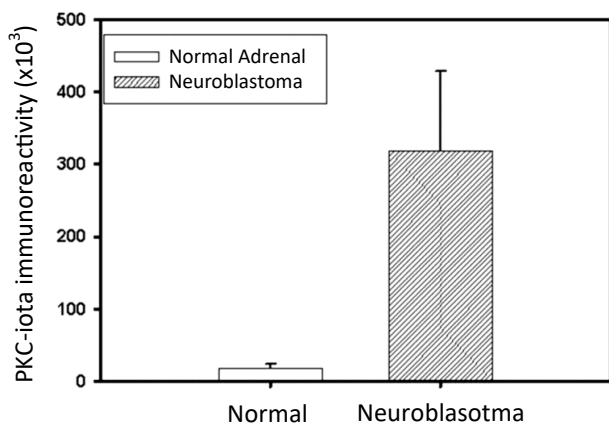


**Proteasome Inhibitors Having Chymotrypsin-Like Activity**  
*Novel Proteasome Inhibitors for Cancer Therapy*

**USF Tech ID# 09A033**

**US Patent# Number: 8,466,157**

Therapeutic Indication: All cancer types  
Mechanism of Action: Selective apoptosis of malignant cells  
State of Technology: *In vitro*



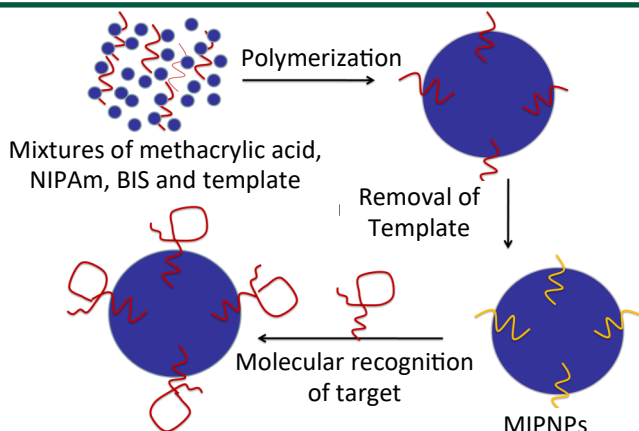
**PKC-iota: A Method to Predict Neuroblastoma Carcinogenesis**

*Differentiates Between Benign and Cancerous Lesions and Treatment of Prostate Tumor*

**USF Tech ID# 09B141**

**Patent Pending**

Assay Type: Protein, Western blot  
Data Available: *Clinical samples*



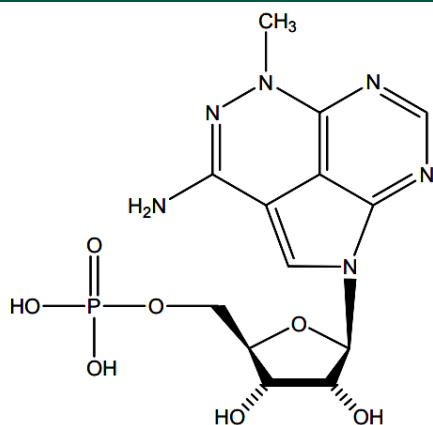
**Compositions: Plastic Antibody for Atrial Natriuretic Peptide**

*High Affinity and Selectivity to ANP*

**USF Tech ID# 11A027**

**US Patent Number: 9,695,262**

Therapeutic Indication: Solid malignancies including metastatic disease  
Mechanism of Action: Attenuate NPRA binding to endogenous ANP  
State of Technology: *In vitro data*



### Effective Treatment of Esophageal Adenocarcinoma Using Triciribine and Related Compounds

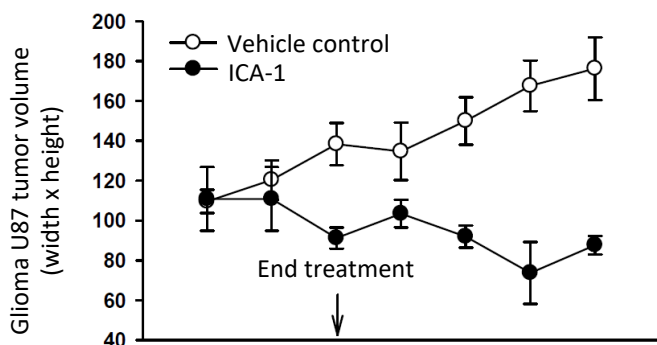
*A Novel Formulation of Triciribine and Related Compounds with Reduced Toxicity*

**USF Tech ID# 11A069**

**US Patent Number: 8,178,502; 8,476,241; 9,457,040; 9,150,604**

Therapeutic Indication: Esophageal adenocarcinoma  
Mechanism of Action: Triciribine and triciribine phosphate cause regression of the esophageal adenocarcinoma

State of Technology: *In vivo*



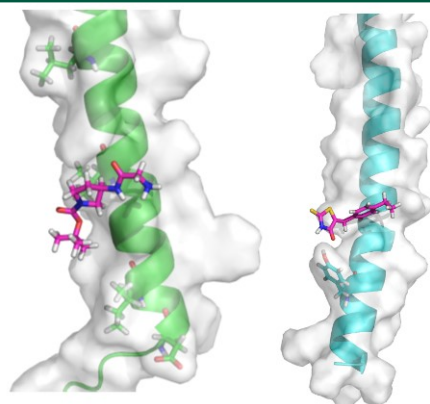
### A Novel PKC-iota Inhibitor for the Treatment of Glioma

*Effective Anti-Tumor Therapy that Inhibits Multiple Targets*

**USF Tech ID# 11B123**

**US Patent Number: 8,716,266**

Therapeutic Indication: Cancer; Glioma tumors  
Mechanism of Action: PKC-iota inhibitor  
State of Technology: *Clinical Samples*



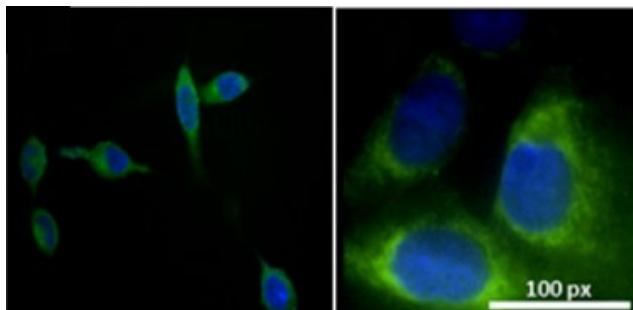
MBD2 Configurations

### MBD2 Inhibitor Discovery Through Protein Intrinsic Disorder Prediction, Molecular Docking, Molecular Dynamics Simulation, and In Vitro & In Vivo Tests

*An Attractive Strategy for Cancer Therapy via Inhibition of MBD2/3 and p66α*

**USF Tech ID# 16A107**  
**Patent Pending**

Therapeutic Indication: All cancer types  
Mechanism of Action: Inhibition of MBD2/3 and p66α interaction  
State of Technology: *In vivo*



Microscope images show that GQD (green) can specifically enter and target cancerous cells (blue)

### Novel Therapeutic for Cancer Detection and Treatment

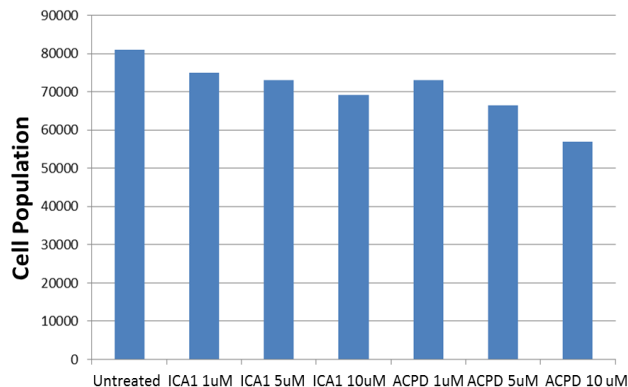
*Graphene Quantum Dot Nanoparticles as Anti-Cancer Drug Carriers and Imaging Agents*

**USF Tech ID# 14A052**  
**Patent Pending**

Therapeutic Indication: All cancer types  
Mechanism of Action: Quantum dot nanoparticles carry anti-cancer drugs to the target site and enable real-time imaging and detection of small tumors

State of Technology: *In vitro*

Du145 Dose Curve



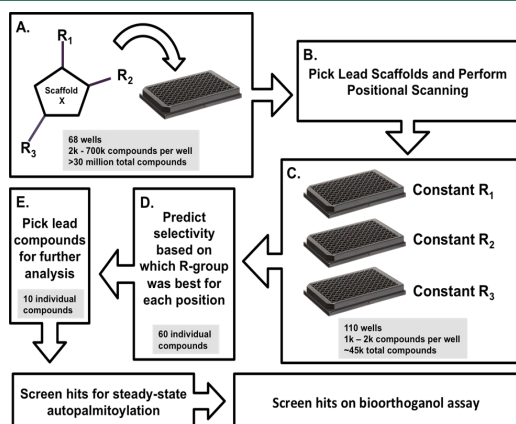
**Method for Treating Prostate Cancer**

Protein Kinase C Inhibitors, ACPD and ICA-1, for Prostate Cancer

**USF Tech ID# 15A067**  
Patent Pending

Therapeutic Indication: Prostate cancer  
Mechanism of Action: Inhibits PKC- $\iota$  and PKC- $\zeta$  which are heavily expressed in prostate cancer cells and mediate apoptosis

State of Technology: *In vitro*



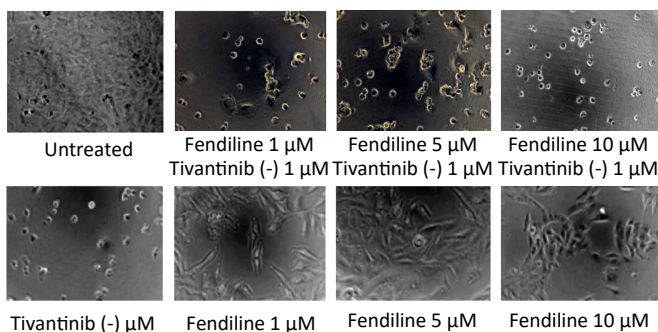
**Protein Acyl Transferase Inhibitor**

Novel Protein Palmitoyltransferases for the Treatment of Various Cancers

**USF Tech ID# 15B115**  
**US Patent Number: 10,085,981**

Therapeutic Indication: All cancer types  
Mechanism of Action: Inhibition of protein palmitoyltransferases that modify Ras oncogene protein

State of Technology: *In vitro*



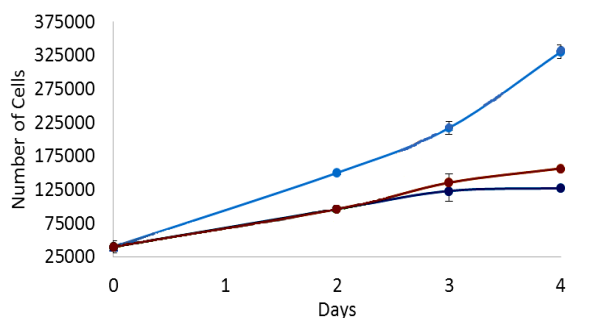
**Combinatorial Therapies for Pancreatic Cancer Treatment**  
Combinatorial Cancer Treatment with Fendiline and Tivantinib

**USF Tech ID# 16A022**  
Patent Pending

Therapeutic Indication: Pancreatic cancer  
Mechanism of Action: Co-treatment of pancreatic cancer cells with Fendiline and Tivantinib for increased apoptosis of these cells

State of Technology: *In vitro*

MeWo Cell Proliferation under different Compound-50 Concentrations as a Function of Time



**A Method of Treating Malignant Melanoma Using Atypical Protein Kinase C Inhibitors**

Novel Application of DNDA, ICA-1, ACPD, and Compound-50 in the Apoptosis of Malignant Melanoma

**USF Tech ID# 16A071, 16B182, 16B200**  
Patent Pending

Therapeutic indication: Malignant melanoma  
Mechanism of action: Inhibition of PKC- $\iota$  and PKC- $\zeta$  which are overexpressed in metastasized melanocytes

State of Technology: *In vivo*

### A Method of Treating Colorectal Cancer Using Atypical Protein Kinase C Inhibitors

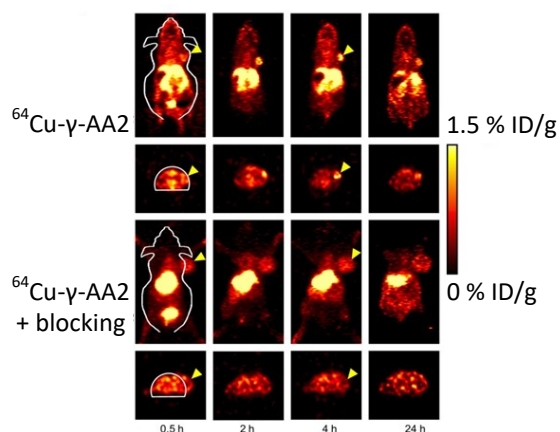
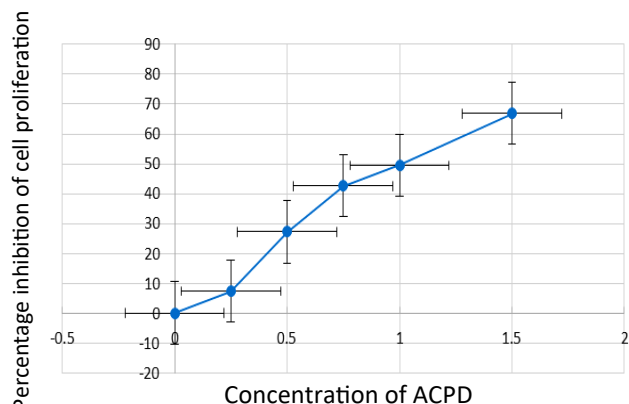
*Effective Blockage of Colorectal Cancer Cell Growth and Proliferation via aPKC inhibition*

**USF Tech ID# 16A098, 16B196**  
**Patent Pending**

Therapeutic Indication: Colorectal cancer  
 Mechanism of Action: Inhibition of atypical protein kinase C  
 State of Technology: *In vitro*

#### Technology Description

USF scientists have gained insight into the complex mechanism behind the proliferation of the cancerous colorectal cells. They have discovered that by inhibiting PKC-iota and PKC-zeta with certain drugs, a significant decrease in cancer cell proliferation is shown. Furthermore, an additional protein kinase inhibitor demonstrated an increase in colorectal cancer cell death without compromising normal colon cell health. This novel method could improve treatments in colorectal cancer.



*Serial PET imaging and biodistribution studies of <sup>64</sup>Cu-γ-AA2 in U87MG tumor-bearing mice. Arrows indicate tumors.*

### RGD Mimetic γ-AA Peptides and Methods of Use

*Y-AA Peptides for the Diagnosis and Treatment*

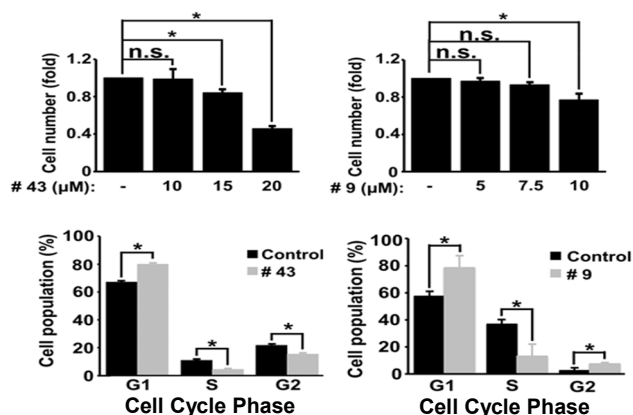
**USF Tech ID# 12A016**  
**US Patent Number: 9,234,007**

Therapeutic Indication: Cancer  
 Mechanism of Action: Binds integrin αvβ3  
 State of Technology: *In vivo modeling*

#### Technology Description

Our scientists have developed novel γ-AA peptide RGD mimetics that are able to target integrin αvβ3 specifically, and exhibit significantly higher stability than commonly used RGD peptides. In mouse tumor models, radiolabeled γ-AA peptide RGD mimetics exhibited integrin αvβ3-specific uptake in tumors. These mimetics have the potential to be used for targeted drug delivery as well as therapeutic and diagnostic agents in the treatment of various cancers.



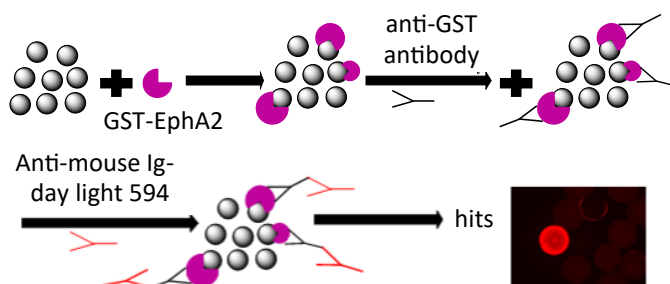


### Small Molecule Compounds and Peptidomimetics as In-Vivo Inhibitors and Activators of Tumor Suppressor PTEN Protein in Human Cells

*Modulation of PTEN Activity in-vivo for the Treatment of Cancers and Neurological Diseases*

**USF Tech ID# 17A011**  
Patent Pending

Therapeutic Indication: All cancer types  
Mechanism of Action: Activation/inhibition of dysregulated PTEN via small molecules  
State of Technology: *In vitro*

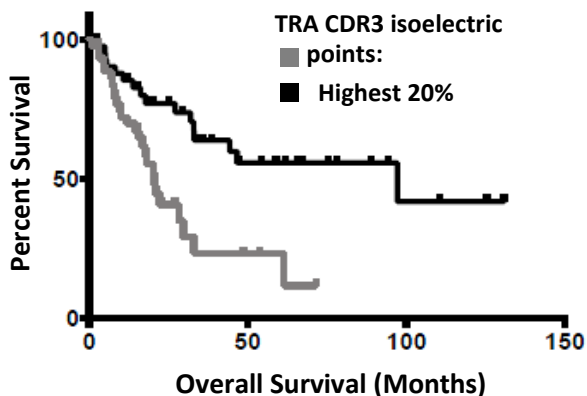


### One-Bead-Two-Compound Macrocyclic Library and Methods of Preparation and Use

*Drug Screening Library for Identification of Compounds Involved in Various Types of Cancer*

**USF Tech ID# 17A046**  
Patent Pending

Therapeutic Indication: All cancer types  
Mechanism of Action: Targeting receptor tyrosine kinase (RTK)  
State of Technology: Compositions



### TCR Mutant Peptide Complementarity Scoring for Therapies and Prognosis

*A Bioinformatics Prediction Approach for Cancers with Mutant Tumor Peptide Activity*

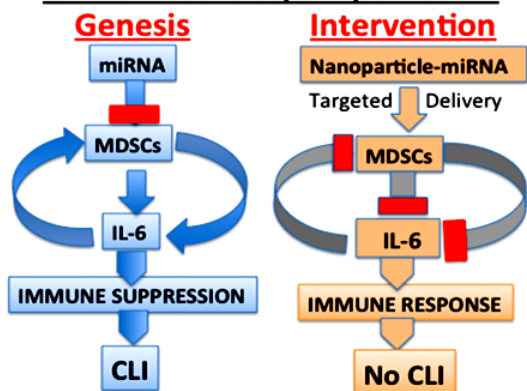
**USF Tech ID# 18B177**  
Patent Pending

Therapeutic Indication: Method for cancer prognostics  
Mechanism of Action: Bioinformatics  
State of Technology: *Lab Tested*

#### Technology Description

USF researchers have developed a genomics-based method to provide prognoses based on tumor immune activity. Also provided are indications for components for effective immunotherapy approaches to cancer treatment. Specifically, this method is able to determine whether a tumor sample has T-cell receptor (TCR) complementarity-determining region 3 (CDR3) chemical features that correspond with the chemical features of a mutant tumor peptide in such a way as to indicate both better survival for the patient and the presumed effectiveness of various immunotherapy approaches. This bioinformatics assessment method of cancer-associated TCR biochemical features cross-examines combinations of T-cell receptor CDR3 amino acid usage with human leukocyte antigen types. It then quantifies and evaluates cancer prognosis statistics.

**MiRNA-IL-6.MDSC (MIM) Axis of CLI**



**A Method of Modulating Immunosenescence**  
*Novel Therapeutics for Treatment of Chronic Lung Inflammation (CLI)*

**USF Tech ID# 11B188**

**US Patent Number: 9,550,992**

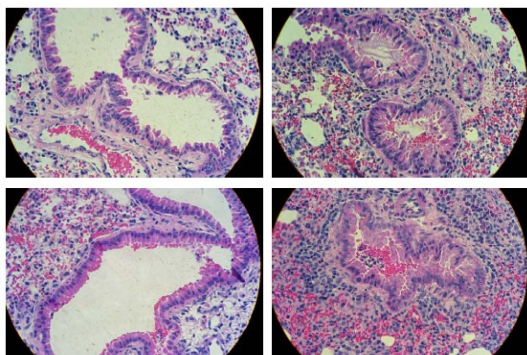
Therapeutic Indication: Chronic lung inflammation

Mechanism of Action: Inhibition of myeloid derived suppressor cells

State of Technology: *In vivo*

Naive

OVA



siNPRA9

Scramble-siNPRA9

**Inflammatory Disease Treatment with siRNA**

*Novel siRNA Target for Treatment of Asthma, RSV Infection, and Other Inflammatory Diseases*

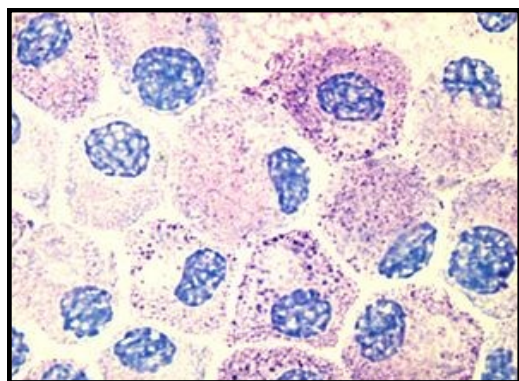
**USF Tech ID# 06A040**

**US Patent Number: 8,071,5650**

Therapeutic Indication: Inflammatory diseases

Mechanism of Action: Inhibition of inflammatory protein expression

State of Technology: *In vivo*



Mast Cells

**Novel Human Mast Cell Line and Uses**

*Human Mast Cell Line to Serve as Experimental Model of Mast Cell Activation in Immunology Studies and Other Research*

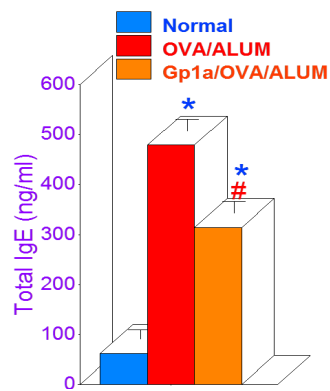
**USF Tech ID# 09A022**

**US Patent Number: 9,096,829**

Therapeutic Indication: Immunology; asthma treatment; biomolecule production

Mechanism of Action: Isolated from umbilical cord blood; survive in culture without exogenous cytokines

State of Technology: *In vitro*



Gp1a attenuates the serum levels of total IgE in mice.

**Method for Reducing Immunoglobulin E**

*Novel Allergy Treatment Using Gp1A*

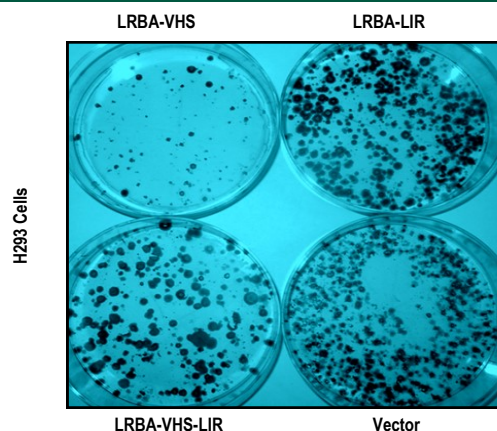
**USF Tech ID# 11A075**

**US Patent Number: 9,289,421**

Therapeutic indication: Asthma, Allergy, Hay Fever

Mechanism of action: CB2 Receptor Agonist

State of technology: *In vivo modeling*



**LRBA: Pro-Inflammatory Marker and Therapeutic Strategy**  
*A Sensitive Biomarker and Effective Therapeutic Target for Inflammatory Diseases*

**USF Tech ID# 13A010**

**US Patent Number: 9,738,706**

Therapeutic Indication: Inflammatory diseases  
 Mechanism of Action: Monitoring and modulation of LRBA levels  
 State of Technology: *Clinical data*



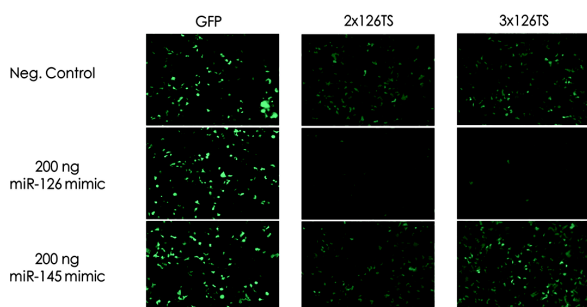
**Novel Additive for Infant Formula to Enhance Infant Health**  
*Optimal Cytokines, Chemokines and Growth Factor (CCGF) Levels for Supplementation of Infant Formula*

**USF Tech ID# 13A087**

**US Patent Number: 9,345,249**

Therapeutic Indication: Breast feeding age infants  
 Mechanism of Action: Addition of CCGF to breast milk/formula  
 State of Technology: *Compositions*

miRNA-mediated silencing corresponds to the number of target sites

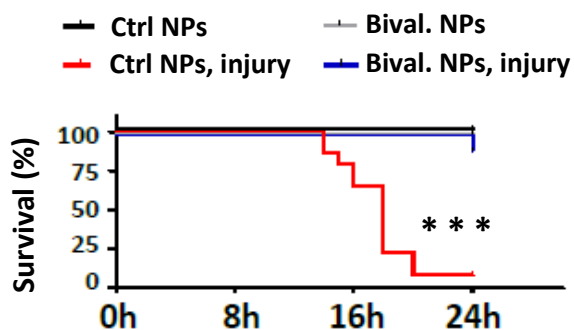


**Cell-Selective Gene Editing**  
*Targets Specific Gene Regulation*

**USF Tech ID# 15B161**

**US Patent Number: 10,188,750**

Therapeutic Indication: Patient-specific therapy  
 Mechanism of Action: Addition of guide RNA to microRNA target sequences  
 State of Technology: *In vitro*

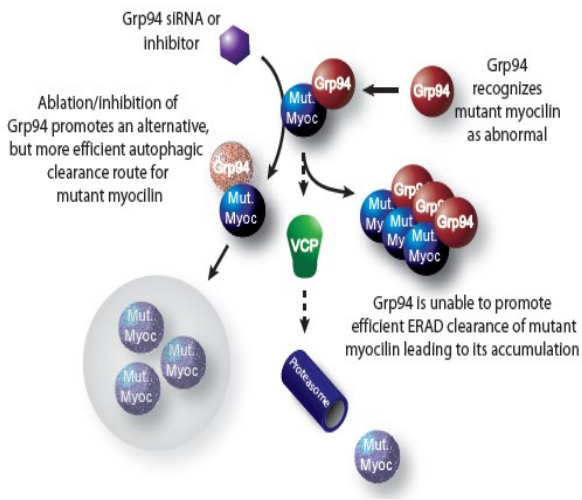


**Anti-Thrombin Therapeutics to Prevent and Treat Neonatal Intestinal Injury**  
*Bivalirudin-Tagged Antithrombin Nanoparticles for NEC*

**USF Tech ID# 18B172**

**Patent Pending**

Therapeutic Indication: Neonatal Intestinal Injury  
 Mechanism of Action: Antithrombin  
 State of Technology: *In vitro*



*Inhibition of Grp94 Facilitates a Rapid Clearance of Mutant Myocilin Species via Autophagy*

**Grp Inhibitors to Treat Steroid-Induced Ocular Hypertensions and Glaucomas**

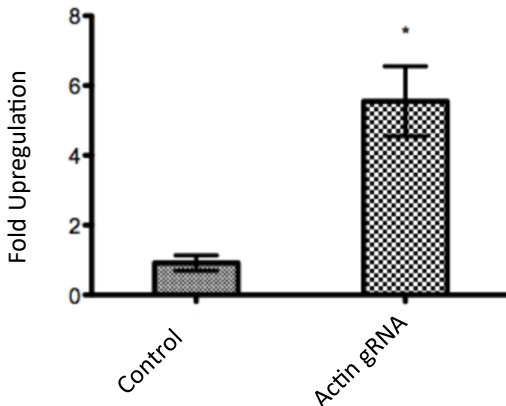
*Steroid Induced Changes Suppressed in the Eye*

**USF Tech ID# 17B176**  
**Patent Pending**

Therapeutic Indication: Prevents steroid-induced changes in the eye  
Mechanism of Action: A therapeutic to inhibit Grp194  
State of Technology: *In vivo*

**Technology Description**

USF researchers have developed novel methods utilizing Grp94 to treat primary open angle glaucoma (POAG), as well as steroid-induced ocular hypertensions and glaucomas. The Grp94 protein is a heat shock protein 90 (Hsp90) family member. The relationship between Hsp90 and ocular diseases have been widely recognized and established. By means of selectively targeting the endoplasmic reticulum chaperone Grp94 using siRNA knockdown or small molecule inhibitors, mutant myocilin can be removed in an efficient manner. This method provides a potential, strong new option for treatment.

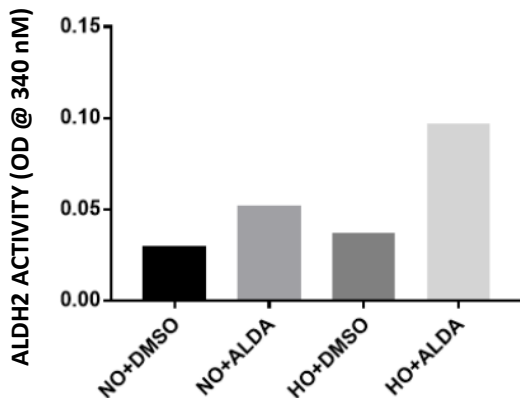


**MicroRNA-based Therapy for Infantile Hemangioma**

*Cutting Edge Therapy for the Treatment of Infantile Hemangioma and other Vascular Malformations*

**USF Tech ID# 16A043**  
**US Patent Number: 10,435,757**

Therapeutic Indication: Infantile Hemangioma  
Mechanism of Action: Regulating expression of chromosome 19 miRNA cluster  
State of Technology: *In vitro*

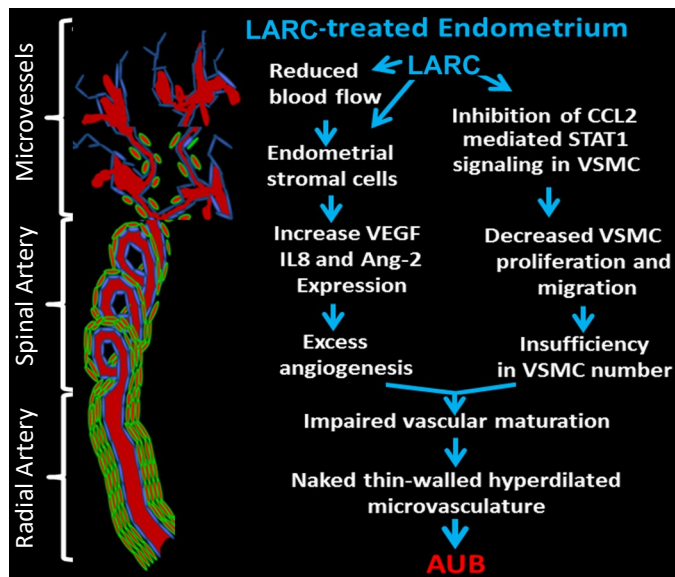


**Alda-1 Shields Endothelial Cells Against Oxidative Stress via Activation of ALDH2**

*Target and Therapeutic Approach for Allergic Diseases via Preservation of the Mitochondria*

**USF Tech ID# 18A048**  
**Patent Pending**

Therapeutic Indication: Therapeutic for allergic diseases  
Mechanism of Action: Aldehyde dehydrogenase 2 (ALDH2) combats mitochondrial dysfunction  
State of Technology: *In vitro*



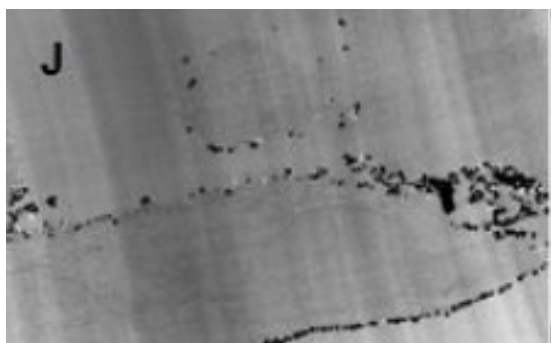
**Chemokine Ligand 2 to Inhibit Abnormal Uterine Bleeding**  
*Adjuvant Treatment to Reverse Long Acting Reversible Contraception (LARC) Inhibition of VSMC Proliferation*

**USF Tech ID# 15A037**  
**Patent Pending**

Therapeutic Indication: Abnormal Uterine Bleeding  
 Mechanism of Action: Effectively inhibits uterine bleeding in women using LARC  
 State of Technology: *In vitro*

**Technology Description**

Researchers at the University of South Florida have identified a molecule, the chemokine ligand 2 (CCL2), whose recombinant human protein form holds promise in preventing Abnormal Uterine Bleeding (AUB) in women using long-acting reversible contraception (LARC). Our inventors have found that two progestin agents used in LARCs reduce proliferation of endometrial vascular smooth muscle cells (VSMCs), resulting in the production of thin-walled hyper-dilated fragile microvessels that are prone to bleed. Further studies have determined that the administration of recombinant CCL2 reverses this LARC effect. This invention utilizes this knowledge in the development of pharmaceutical compositions that can inhibit AUB associated with use of LARCs. These novel agents can be administered prophylactically in dosage form for oral, injectable, or transdermal delivery. This adjuvant treatment has the potential to effectively reduce side effects in women using LARCs through improved contraceptive formulations.



NPG nanoparticles observed along the cell membrane after 5 Minutes of treatment.

**Estrogen Anchored Micelles for Co-Delivery of Paclitaxel and BH3-Mimetic Enhance Therapeutic Efficacy in Breast Cancer: A Proteomics Guided Nano-Therapeutic Discovery**  
*Encapsulating Paclitaxel Increases Drug Potency and Minimizes Side Effects*

**USF Tech ID# 14B158**  
**Patent Pending**

Therapeutic Indication: Breast cancer  
 Mechanism of Action: Upregulation of Zinc Finger Protein 350  
 State of Technology: *In vivo*

**Technology Description**

USF researchers have demonstrated the use of novel tumor targeting delivery of Paclitaxel. Research in animal models has shown that encapsulating the drug minimized side effects while increasing the drugs potency.

The invention comprises two methods. The first method is the use of a novel estrogen anchored multifunctional polymer micelle (NPG) for the clinical co-delivery of cytotoxic drugs as opposed to the conventional Paclitaxel formulations. The second method is the use of ZNF350 as a new target for cancer therapy as its upregulation, induced by NPG, has been associated with anti-tumor efficacy.

**PKC-iota Inhibitor for the Treatment of Breast Cancer**  
*Potent Chemotherapy Against Breast Cancer*

**USF Tech ID# 10A080**

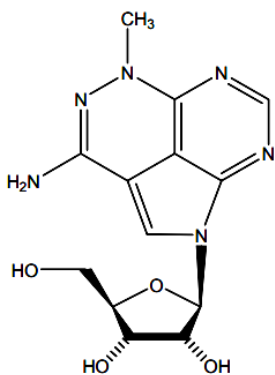
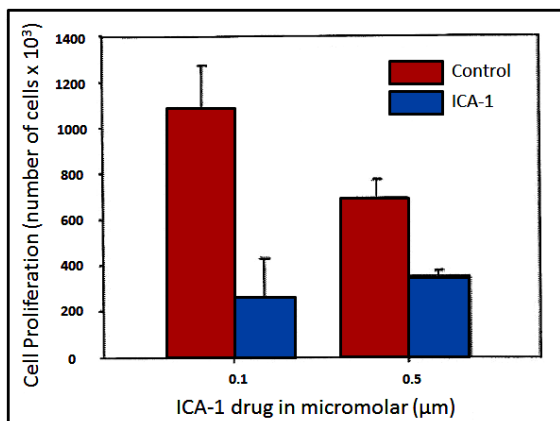
**US Patent Number: 9,351,981**

Therapeutic Indication: Breast cancer  
 Mechanism of Action: Inhibition of PKC-ι via ICA-1  
 State of Technology: *Clinical samples*

**Technology Description**

USF inventors have identified ICA-1 as a novel chemotherapeutic agent for breast cancer. The compound blocks the catalytic activity of PKC-ι by binding to a specific region of amino acids on the protein and demonstrates potent anti-proliferative activity on human breast cancer cells.

ICA-1 targets a unique pathway found in breast cancer that may have a synergistic effect on cancer cells when used with other forms of anti-cancer therapy. Thus, it has potential as a standalone chemotherapeutic or as part of combinatorial therapy.



**Effective Treatment of Ovarian Cancer Using Triciribine and Related Compounds**

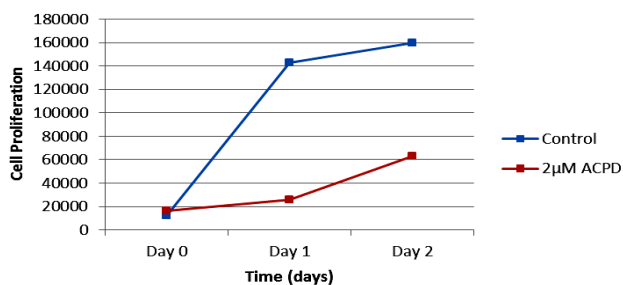
*Treatment Based on the Discovery that Deregulation is Shown in a Number of miRNAs in Human Ovarian Cancer*

**USF Tech ID# 11B113**

**US Patent Number: 9,433,635; 8,906,869; 10,076,534**

Therapeutic Indication: Ovarian cancer  
 Mechanism of Action: Deregulation of Akt Kinase Expression  
 State of Technology: *In vitro*

**2μM ACPD Cell Proliferation**

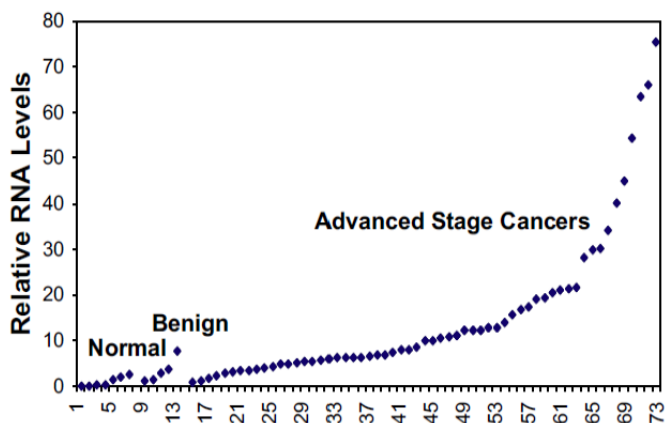


**A Method to Inhibit Ovarian Cancer Proliferation**  
*Halt Ovarian Cancer Progression*

**USF Tech ID# 14A088**

**US Patent Number: 9,301,965**

Therapeutic Indication: Ovarian Cancer  
 Mechanism of Action: Protein kinase C (PKC) Inhibitor  
 State of Technology: *Preclinical*



**SnoN/SkiL in Ovarian Cancer**  
*Early Stage Detection*

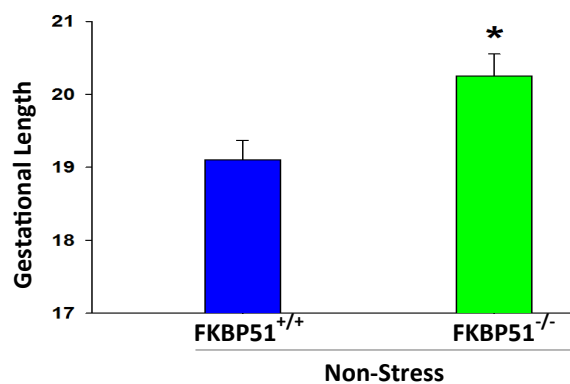
**USF Tech ID# 08B108**

**US Patent Number: 8,211,646**

Therapeutic indication: Ovarian cancer

Mechanism of action: mRNA

State of Technology: Cell lines



\* p=0.01 KO NS vs WT NS

**Prevention of Preterm Birth (PTB) by Inhibition of FKBP51**  
*Increases Gestational Length and Reduces Infant Mortality*

**USF Tech ID# 17A001**

**Patent Pending**

Therapeutic indication: Preterm birth

Mechanism of action: Inhibition of gene FKBP51

State of Technology: *In vivo*



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