Advancing USF Innovation

Therapeutics

Neurology
Endocrinology
Cardiology
Otology
Regenerative Medicine
The Technology Transfer Office (TTO) was established in 1990 to facilitate the commercialization of university intellectual property, including patents and copyrights.

The TTO works with researchers and students in every college to ready new inventions for the patenting process and potential licensing opportunities. 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.

Our office has a knowledgeable and professional staff with specialized backgrounds, who work in collaborative teams in the areas of marketing, patent prosecution and licensing to direct the movement of new ideas, discoveries and innovation into the commercial and public sectors. TTO endeavors to educate and promote innovation, the result of which is products, jobs and technologies utilized in the public interest.

USF was ranked in the Top 20 of American Universities for technology transfer by the prestigious Milken Institute. With 116 new utility patents issued in 2017, USF ranks fifth among American public universities and 12th among universities worldwide in generating new U.S. patents, according to the National Academy of Inventors (NAI) and Intellectual Property Owners Association (IPO). In FY 2018, the university had 127 license and option agreements. USF also had 10 new startup companies in FY 2018, and has facilitated the formation of 51 startup companies in the last 5 years. TTO endeavors to educate and promote innovation, the result of which is products, jobs and technologies utilized in the public interest.

[http://www.usf.edu/research-innovation/pl/]
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**Target Sequences for Anti-Restenotic Therapy**
Incorporating Target Sequences for a Certain MicroRNA Into 3'-UTR of Gene of Interest

**USF Tech ID# 13B196**
Patent Pending

Therapeutic Indication: Cardiovascular disease  
Mechanism of Action: Inhibits VSMC via overexpression of p27  
State of Technology: In vivo

**Bioactive Lipid Sphingosine-1-Phosphate to Stabilize Arterial Blood Flow and Pressure**
Improvement of Resuscitation Efforts in Alcohol-Intoxicated Trauma Patients

**USF Tech ID# 14B170**
Patent Pending

Therapeutic Indication: Alcohol-intoxicated trauma  
Mechanism of Action: Increase in S1P/ S1P receptor antagonists  
State of Technology: In vivo

**Modulating Sortilin to Lower LDL Cholesterol**
Compounds That are Not Associated with Off-Target Immunological Side Effects

**USF Tech ID# 16A004**
Patent Pending

Therapeutic Indication: LDL cholesterol and cardiovascular disease  
Mechanism of Action: Block secretion of PCSK9  
State of Technology: Compositions

**Bioengineered Anti-IKACH Peptibodies**
Safe and Atrial Specific Peptibodies for the Treatment of Chronic Atrial Fibrillation

**USF Tech ID# 16B169**
Patent Pending

Therapeutic Indication: Atrial fibrillation  
Mechanism of Action: Inhibits acetylcholine activated inward rectifier current (IKACH)  
State of Technology: In vivo
**Human Mesenchymal Progenitor Cells and Method of Isolation and Purification**

Isolation and Purification of MPCs to Treat Graft-Versus-Host Diseases

**USF Tech ID# 00A004**

US Patent Numbers: 7,691,415; 7,303,769; 6,936,281

Therapeutic Indication: Graft-versus-host diseases, tissue rejection, cancer

Mechanism of Action: Pluridifferentiated stem cells

State of Technology: In vivo

**SHIP Inhibition to Enhance Transplantation and Hematopoiesis**

A Novel Therapeutic Target

**USF Tech ID#s 00B053, 03A042, and 03B078**

US Patent Numbers: 7,713,945; 8,163,710; 7,691,821; 7,807,646; 7,763,592; 8,008,273

Therapeutic Indication: Graft-versus-host diseases, tissue rejection

Mechanism of Action: Inhibition of SH2–containing inositol phosphatase (SHIP)

State of Technology: In vivo

**Human Mesenchymal Progenitor Cells**

Simultaneously Expresses a Plurality of Genes that are Markers for Multiple Cell Lineages for Regenerative Medicine

**USF Tech ID# 01B073**

US Patent Numbers: 8,057,826; 7,049,072; 7,442,390

Therapeutic Indication: Graft-versus-host diseases, tissue rejection, bone marrow transplantation

Mechanism of Action: Pluridifferentiated mesenchymal progenitor cells

State of Technology: In vivo

**Vector Beacon and Method for Attracting Stem Cells to Sites of Injury for Tissue Repair**

Vigilant Stem Cell Beacon

**USF Tech ID# 03A044**

US Patent Number 8,569,471

Therapeutic Indication: Injury, tissue/organ regeneration

Mechanism of Action: Chemokine delivered to injured tissue, increase of stem cells to injury site

State of Technology: In vitro
**Method for Protecting Genetically Modified Stem Cells**

*Tissue Specific Vigilant Stem Cells*

**USF Tech ID# 03B057**  
**US Patent Number:** 9,040,676  
Therapeutic Indication: Diabetes, cancer, stroke, atherosclerosis, cardiovascular diseases, hypoxia  
Mechanism of Action: Stable vectors, gene switch/biosensor, gene amplification system  
State of Technology: *In vitro*

**Xenopus Laevis Oocytes as Micro-Incubator for Suspension of Small Cells**

*Allows Reprogramming Adult Cells Without Genetic Manipulation of Donor or Recipient*

**USF Tech ID# 04A027**  
**US Patent Number:** 7,135,336  
Therapeutic Indication: Cell therapy  
Mechanism of Action: Reprogramming into universal stem cells  
State of Technology: *In vitro*

**siRNA Based Therapy for Nitric Oxide Modulation**

*Improvement of Endothelial Function*

**USF Tech ID# 04A060**  
**US Patent Number:** 7,718,625  
Therapeutic Indication: Heart failure, hypertension, hypercholesterolemia, atherosclerosis, diabetes  
Mechanism of Action: Regulation of AS expression and NO production  
State of Technology: *In vitro*

**Prenatal Administration of Stem Cells for Therapeutic Treatments**

*Effective In Utero Treatment for Congenital or Inherited Diseases Using Umbilical Cord Stem Cells*

**USF Tech ID# 05B116**  
**US Patent Number:** 9,173,907  
Therapeutic Indication: Congenital conditions, inherited diseases  
Mechanism of Action: Delivery of stem cells in utero  
State of Technology: *In vivo*
### Combination of Insulin and Ascorbate to Enhance Wound Healing

**Method of Enhancing Wound Healing via Enhanced Collagen Synthesis**

**USF Tech ID# 06A060**  
**US Patent Numbers:** 7,834,153; 8,921,312

**Therapeutic Indication:** Wounds and surgical care  
**Mechanism of Action:** Increase in collagen synthesis  
**State of Technology:** In vitro

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### Stable Differentiation of Adult Stem Cells

**Method of Differentiating Adult Stem Cells to Neurons**

**USF Tech ID# 06B116**  
**US Patent Number:** 8,778,680

**Therapeutic Indication:** Neurodegenerative disease, stroke, spinal cord injury  
**Mechanism of Action:** Disrupt key growth factor interaction via tyrosine kinase targets  
**State of Technology:** In vitro

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### Combination of Folate and Inositol for Chronic Wound Healing

**Stimulates Wound Healing and Tissue Organization**

**USF Tech ID# 08B126**  
**US Patent Numbers:** 8,883,744; 9,308,210

**Therapeutic Indication:** Chronic wound healing  
**Mechanism of Action:** Inhibition of canonical Wnt signaling  
**State of Technology:** In vivo

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### Method for Treatment of Skeletal Dysplasias via Vessel Dilator

**Stimulation of Osteoblast Proliferation via Cardiac Hormone Vessel Dilator**

**USF Tech ID# 10A040**  
**Patent Pending**

**Therapeutic Indication:** Skeletal dysplasias, osteoporosis, achondroplasia  
**Mechanism of Action:** Proliferation of osteoblasts  
**State of Technology:** In vitro
Protease Resistant Growth Factor Formulations for Chronic Wound Healing
Novel Formulation of Fusion Which Preserves the Bioactivity of Different Growth Factors and Functional Peptides

**USF Tech ID# 15B151**  
Patent Pending

Therapeutic Indication: Chronic wounds, tissue regeneration  
Mechanism of Action: Fusion of elastase resistant peptide PMP-D2 variant to bioactive protein  
State of Technology: *In vitro*

Use of Exosomes from Adipocyte Derived Stem Cells for Healing Ischemic Wounds
Novel Method of Use of Secreted Factors to Induce Cell Migration, Cell Proliferation, and Angiogenesis

**USF Tech ID# 16A081**  
Patent Pending

Therapeutic Indication: Ischemic wounds  
Mechanism of Action: Secreted factors in exosome particles to stimulate natural repair  
State of Technology: *In vivo*

Reduction of Microhemorrhages in the Spinal Cord of Symptomatic ALS Mice After Intravenous Human Bone Marrow Stem Cell Transplantation Accompanies Repair of the Blood-Spinal Cord  
The Effects of Intravenous Human Bone Marrow CD34+ (hBM34+) Cell Transplantation

**USF Tech ID# 17A028**  
Patent Pending

Therapeutic Indication: Blood-spinal cord barrier repair  
Mechanism of Action: Bone marrow cell transplantation  
State of Technology: *In vivo*

Systems and Methods for the Design and Fabrication of Three-Dimensional Printed Bone Allografts  
Manufactured Bone Scaffolds Based on Human Bone Tissue

**USF Tech ID# 17B179**  
Patent Pending

Therapeutic Indication: Human bone tissue regeneration  
Mechanism of Action: Powdered decellularized bone mixed with powdered polycaprolactone (PCL)  
State of Technology: Compositions
2-Acetyl-1,3-Cyclopentanedione for Metabolic Disorders
Prevents Development of Disease and Diminishes Pre-Existing Disease

**USF Tech ID# 13A021**
**Patent Pending**

Therapeutic Indication: Metabolic disorders, diabetes
Mechanism of Action: Inhibits atypical PKCs, PKC-zeta, and PKC-lambda/ iota
State of Technology: *In vivo*

Clk1 Inhibitors for the Induction of White to Brite Adipogenesis
New Weight Loss Therapy

**USF Tech ID#s 14B155 & 16A003**
**Patent Pending**

Therapeutic Indication: Obesity, diabetes, weight related co-morbidities
Mechanism of Action: Clk1 inhibitors
State of Technology: Compositions

Sortilin-Bind Small Molecule Increases Glucose Uptake
Control Glucose Transport in Obese Diabetics

**USF Tech ID#s 15A043 & 16A008**
**Patent Pending**

Therapeutic indication: Diabetes, high blood glucose
Mechanism of action: Sortilin catalyst and PKCδ inhibitor
State of technology: *In vitro*

BAG5-Binding Small Molecule
Multi-Faceted and Specific Therapy

**USF Tech ID# 15B184**
**Patent Pending**

Therapeutic Indication: Diabetes mellitus
Mechanism of Action: Stabilize and increase levels of GAS5 IncRNA
State of Technology: Clinical Data
Characterization and Manipulation of Adipose Stem Cell Depots to a Metabolically Healthy State
Transforming Metabolic Dysfunction to a Metabolically Healthy State

**USF Tech ID# 16A097**
Patent Pending

Therapeutic indication: Metabolic diseases, obesity
Mechanism of action: Modulate adipose stem cells
State of technology: In vitro

5-Aminolevulinate Synthase Inhibitors
Novel Molecules Effective Against Metabolic Disorders

**USF Tech ID# 17A079**
Patent Pending

Therapeutic Indication: Metabolic disorders and heme biosynthesis disorders
Mechanism of Action: Kinetic target-guided synthesis
State of Technology: In vitro

Compositions and Methods for Adipocyte Modulation
Novel Inhibitor for Obesity Management

**USF Tech ID# 13A098**
US Patent Number: 9,458,086

Therapeutic Indication: Obesity, diabetes, weight related co-morbidities
Mechanism of Action: PKCδ II inhibitors
State of Technology: In vitro

Cardioprotective Activity of Nampt Activator
Nampt Activator Modulates Pyridine Nucleotides

**USF Tech ID# 16A010**
Patent Pending

Therapeutic Indication: Diabetes, insulin resistance, and cardiac function
Mechanism of Action: Increase nicotinamide adenine dinucleotide (NAD) levels
State of Technology: In vitro
**Hormone Treatment for Age-Related Hearing Loss**  
*Novel Use of Aldosterone*

**USF Tech ID# 13B200**  
Patent Pending

Therapeutic Indication: Age-related hearing loss  
Mechanism of Action: Maintains homeostasis for potassium and sodium through NKCC1  
State of Technology: *In vivo*

**Technology Description:**
Researchers at USF have developed a novel drug composition of FDA-approved compounds that achieve significant therapeutic effects for ARHL. The initial evidence supports the effectiveness of the new drug from in vitro experiments, and in vivo studies of aging mice. The new drug preserves hearing and modulates spiral ganglion neuron degeneration in the aging cochlea. This technology can be very effective in the treatment of ARHL.

The drug works by upregulating the expression and activity of NKCC1 ion channels to improve the flow of potassium ions in the cochlea to help hearing.

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**Modulation of Age-Related Hearing Loss by a Targeted Peptide**  
*Pharmaceutical Formulation for Treating Age-Related Hearing Loss*

**USF Tech ID# 16A047**  
Patent Pending

Therapeutic Indication: Age-related hearing loss  
Mechanism of Action: Suppressing channel gating of heterologously expressed human BK channels  
State of Technology: *In vivo*

**Technology Description:**
Researchers at USF have developed a method of improving age-related hearing loss by suppressing channel gating of heterologously expressed human BK channels with systematic application of the newly discovered BK channel blocker. Pharmacological application in high dosage will suppress audiogenic seizures, while lower dose application will effectively reduce the effects of age-related hearing loss.
Combinatorial Biotherapeutic and Sound Therapy Prevention for Sensorineural Hearing Loss
Effective Combinatorial Therapy for Sensorineural Hearing Loss

USF Tech ID# 17A010
Patent Pending

Therapeutic Indication: Sensorineural hearing loss
Mechanism of Action: Antioxidant, caspase inhibitor, neurotrophic factor in combination with preconditioned sound therapy
State of Technology: In vivo

Technology Description:
Researchers at USF have invented a translational approach involving an antioxidant, a caspase inhibitor and a neurotrophic factor in combination with acoustico-mechanical stimulation therapy (i.e. preconditioning sound therapy) to prevent hair cell and spiral ganglion neuronal damage and/or death associated with ototoxic drugs. The inclusion of sound therapy to the above mentioned treatment elicits a protective environment against cisplatin and aminoglycoside-induced hearing loss and hair cell death.

Targeted Feature-Specific Sensory Therapy
Active Sound Therapy for the Treatment of Sensory Deficits

USF Tech ID# 17A017
Patent Pending

Therapeutic Indication: Sensory deficits
Mechanism of Action: Active sound therapy
State of Technology: Clinical data

Method of Treating Debilitating Hyperacusis
A Hearing Aid Device for the Treatment of Hyperacusis

USF Tech ID# 18A104
Patent Pending

Therapeutic Indication: Hyperacusis hearing disorder treatment
Mechanism of Action: Hearing aid with earplugs and sound generators
State of Technology: Prototype available
Novel Methods for Making Pharmaceutical Drug Forms
Methods of Making and Using Medicinal Compounds

USF Tech ID# 05B101
US Patent Number: 8,436,029

Therapeutic Indication: Various
Mechanism of Action: Various
State of Technology: Compositions

Nutraceutical Co-Crystals
Emerging Class of Pharmaceutical Materials

USF Tech ID# 07B114
Patent Pending

Therapeutic Indication: Various
Mechanism of Action: Various
State of Technology: Compositions

Synthesis of Cannabinoids and Novel Analogs
Control and Evaluation of Cannabinoids

USF Tech ID# 17A086
Patent Pending

Therapeutic Indication: Various
Mechanism of Action: Antagonists of cannabinoid receptors CB1 and CB2
State of Technology: Compositions

Synthetic Routes to Catechin Metabolites
Methods for Synthesizing Catechin Compounds to Study their Biochemical Properties and Potential for Large Scale Synthesis

USF Tech ID# 15B179
Patent Pending

Therapeutic Indication: Nutritional supplement
Mechanism of Action: Synthetic production avoids need to isolate compounds from natural sources
State of Technology: In vitro
Identification Arginine Deiminase Gene Therapy for Disordered Proteins

New Treatment for Neurodegenerative Diseases

USF Tech ID# 15A023
Patent Pending

Therapeutic Indication:  Protein aggregation disorders  
Mechanism of Action:  Arginine metabolism and processing  
State of Technology:  In vivo

Cell Modeling of Heme Deficiency Using Ferrochelatase Mutations

Ferrochelatase Variants with Resistance to NMPP Inhibition Without Interrupting Heme Synthesis

USF Tech ID# 06A045
US Patent Numbers:  8,748,172; 8,586,530

Therapeutic Indication:  Alzheimer’s disease, frataxin-deficiency mediated diseases  
Mechanism of Action:  Resistance to NMPP inhibition  
State of Technology:  In vitro

Luteolin and Diosmin Therapies

Natural Compounds for Novel Treatment of Neurodegenerative Diseases

USF Tech ID# 07A009
US Patent Numbers:  8,778,986; 8,802,638

Therapeutic Indication:  Alzheimer’s disease, dementia  
Mechanism of Action:  Inhibit γ-secretase activity  
State of Technology:  In vivo

Promotion of Brain Self-Repair Mechanisms by Stereotaxic Microstimulation

Regeneration of Brain Cells via Acupuncture

USF Tech ID# 07B087
US Patent Number:  8,452,408

Therapeutic Indication:  Neurodegenerative diseases, Alzheimer’s disease, Parkinson’s disease, Huntington’s disease  
Mechanism of Action:  Stimulates self repair mechanisms  
State of Technology:  In vivo
Luteolin and Diosmin for Dementia and Autism
**Natural Remedies**

**USF Tech ID# 08B080**
**US Patent Number:** 8,778,894

**Therapeutic Indication:** Autism
**Mechanism of Action:** Blockade of Stat-3 signaling
**State of Technology:** *In vivo*

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Methods of Treating Cognitive Impairment
**Novel Methods to Improve Cognitive Function**

**USF Tech ID# 09A020**
**US Patent Numbers:** 9,682,124; 9,132,168; 9,700,597

**Therapeutic Indication:** Alzheimer’s disease
**Mechanism of Action:** GM-CSF and G-CSF to reduce pathological processes
**State of Technology:** *Early Clinical*

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TCR Clonality Biomarker
**Novel Method Using Immune Cell Characteristics to Screen for Alzheimer’s Disease and Neurodegenerative Diseases**

**USF Tech ID# 09A047**
**US Patent Number:** 8,383,347

**Therapeutic Indication:** Alzheimer’s disease, neurodegenerative diseases
**Mechanism of Action:** Identifies changes in adaptive immune system
**State of Technology:** *In vivo*

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Bayberry Extracts and Myricanol Derivatives for Alzheimer’s Disease
**Multiple Compositions Reduce Levels of Microtubule Associated Protein Tau**

**USF Tech ID#s 10A056 & 11B190**
**US Patent Number:** 8,940,945; 9,206,103; 9,598,338

**Therapeutic Indication:** Alzheimer’s disease
**Mechanism of Action:** Reduction of Tau
**State of Technology:** *In vitro*
Recombinant Adeno-Associated Virus Expression of Fractalkine
Effective Therapy for α-synuclein Mediated Neurological Diseases

**USF Tech ID# 11A063**
**Patent Pending**

Therapeutic Indication: Neurological disorders, Parkinson’s disease
Mechanism of Action: Up-regulation of sFKN expression to reduce α-synuclein mediated neurodegeneration
State of Technology: *In vivo*

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MicroRNAs for the Detection of Epilepsy and Selection Tool for Stem Cells
Novel Biomarker for Research and Clinical Applications

**USF Tech ID# 11B148**
**Patent Pending**

Therapeutic Indication: Epilepsy
Mechanism of Action: Biomarker
State of Technology: *Clinical samples*

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Inhibition of Aβ Protein Aggregations
Novel Drug Candidate and Shortened Approach

**USF Tech ID# 13A078**
**US Patent Number:** 9,645,155

Therapeutic Indication: Alzheimer’s disease
Mechanism of Action: Disassembles Aβ aggregation and removes toxicity of Aβ42 aggregates
State of Technology: *In vitro*

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NT-020 (NutraStem®) Increases Memory in Elderly Patients
Method of Improving Cognitive Function

**USF Tech ID# 13A086**
**Patent Pending**

Therapeutic Indication: Neurodegenerative diseases
Mechanism of Action: Stimulate human bone marrow cell proliferation, increase stem cell function and homing of stem cells to injury
State of Technology: *Clinical Data*

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Amygdala derived cells exhibited more elaborate neural differentiation markers than hippocampal cells.
**Epitopes of Alpha Synuclein for Vaccine and Antibody Development Against Parkinson’s Disease**

**Vaccine for Both Treatment and Prevention of Parkinson’s**

**USF Tech ID# 13B124**
Patent Pending

- **Therapeutic Indication:** Parkinson’s disease
- **Mechanism of Action:** Dendritic cell-based vaccine
- **State of Technology:** *In vivo*

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**Amyloid Precursor Protein (APP) Based (β-Secretase) Inhibitor Peptides**

*Swedish Mutant Peptides and Swedish Mutant Fusion Peptides Containing Tat Transduction Domain*

**USF Tech ID# 13B144**
Patent Pending

- **Therapeutic Indication:** Alzheimer’s disease, HAND, Lewy body dementia, CAA, MCI, neurodegeneration
- **Mechanism of Action:** Attenuate Aβ production
- **State of Technology:** *In vitro*

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**Hexachlorophene for the Treatment of ALS and Related Disorders**

*Decrease in Endogenous and Overexpressed TDP-43 Accumulation*

**USF Tech ID# 13B176**
Patent Pending

- **Therapeutic Indication:** ALS, neurodegenerative diseases
- **Mechanism of Action:** Reduction in TDP-43 levels
- **State of Technology:** *In vitro*

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**Hexachlorophene for the Treatment of Parkinson’s Disease and Neurodegenerative Disorders**

*Novel Method of Decreasing LRRK2 Protein Levels*

**USF Tech ID# 13B177**
US Patent Number: 9,750,753

- **Therapeutic Indication:** Parkinson’s disease, neurodegenerative diseases
- **Mechanism of Action:** Reduction in LRRK2 protein levels
- **State of Technology:** *In vitro*
Improved Methylene Blue Delivery to the Brain with Use of Nanoparticles
Methylene Blue Loaded Nanoparticles for More Effective Treatment

**USF Tech ID# 13B188**
Patent Pending

Therapeutic Indication: Alzheimer’s disease, neurodegenerative diseases
Mechanism of Action: Improves BBB permeation
State of Technology: *In vitro*

Hsc70 Inhibitor Effects and Mechanisms
Novel Methods of Inhibiting Tau Protein Aggregate

**USF Tech ID# 14A021**
US Patent Number: 9,642,842

Therapeutic Indication: Alzheimer’s disease, neurodegeneration diseases, cancer
Mechanism of Action: Reduction in tau levels and accumulation via Hsc70 inhibition
State of Technology: *In vitro*

Human Umbilical Cord Blood Serum and Plasma for Treatment of Neurodegenerative Disorders
Human Umbilical Cord CBS and Plasma Promotes Amyloid Precursor Protein α-Cleavage

**USF Tech ID# 14B143**
Patent Pending

Therapeutic Indication: Alzheimer’s disease, neurodegenerative disorders
Mechanism of Action: Enhances sAPPα secretion and production
State of Technology: *In vivo*

Discovery of Novel Inhibitors of the Inhibitors of the FKBP51 Protein from a High-throughput Drug Screen
First Treatment to Target Inhibition of FKBP51

**USF Tech ID# 15A031**
US Patent Number: 9,399,039

Therapeutic Indication: PTSD, anxiety disorders, Alzheimer’s disease
Mechanism of Action: Inhibition of FKBP51 protein
State of Technology: *In vitro*
An Ionic Co-Crystal of Lithium, LISPRO for Treatment of Fragile X Syndrome
Cost Effective Treatment with a Reduction in Side Effects

**USF Tech ID# 15B138**
**Patent Pending**

Therapeutic Indication: Psychiatric and neurodegenerative disorders
Mechanism of Action: Reduction in GSK activity
State of Technology: *In vivo*

Improved Motor Function with Ketone Supplementation
Ketone Supplementation Without Dietary Restriction

**USF Tech ID# 16A019**
**Patent Pending**

Therapeutic Indication: Motor function
Mechanism of Action: Elevates blood ketone levels
State of Technology: *In vivo*

ICAPP and Other aPKC Inhibitors for Treatment of Neurodegenerative Conditions Diseases and Disorders
Effective Treatment of Neurodegenerative Diseases

**USF Tech ID# 16A048**
**Patent Pending**

Therapeutic Indication: Alzheimer’s Disease, Amyloidpathies
Mechanism of Action: Inhibits Insulin-stimulated aPKC Activity and Aβ Production
State of Technology: *In vivo*

Inhibition of Aggregation of Amyloidosis Using Cactus Extracts from the Opuntia Ficus Indica
Novel Alzheimer’s Disease Treatment

**USF Tech ID# 16A068**
**Patent Pending**

Therapeutic Indication: Alzheimer’s Disease, Tauopathies
Mechanism of Action: Inhibits formation of amyloid β-protein fibrils
State of Technology: *In vitro*
Improving Neural Cell Regeneration and Migration with Ketones
Novel Treatment of Neural Cell Injuries and Diseases

USF Tech ID# 16B128
Patent Pending

Therapeutic Indication: Neurodegeneration, neural cell injuries and diseases
Mechanism of Action: Increases neural cell regeneration and migration
State of Technology: In vitro

Drugs to Mimic or Block Actions of Granulocyte-Colony Stimulating Factor (G-CSF)
Controlling Actions of G-CSF Without Stimulating WBCs

USF Tech ID# 16B135
Patent Pending

Therapeutic Indication: Stroke, traumatic brain injury, AD, PD, ALS
Mechanism of Action: Inhibition of G-CSF receptor activity
State of Technology: In vitro

Strategic Treatment of CNS Oxygen Toxicity Seizures
Ketogenic Treatment of CNS Oxygen Toxicity Seizures

USF Tech ID# 16B138
Patent Pending

Therapeutic Indication: Central nervous system oxygen toxicity
Mechanism of Action: Reverse the metabolic dysregulation and oxidative stress
State of Technology: In vivo

Exploiting Allosteric Antagonists to GPRC6a to Mitigate Proteinopathies
A Reduction in Morbidity and Mortality from Proteinopathies

USF Tech ID# 16B142
Patent Pending

Therapeutic Indication: Neurodegenerative diseases; synucleinopathies, tauopathies
Mechanism of Action: Target GPRC6a and promote the clearance of various forms of tau and alpha synuclein
State of Technology: In vitro
Human Bone Marrow CD34+ Cell Transplantation Prevents Microhemorrhages in the Spinal Cord by Capillary Cell Engraftment

Future Therapeutic Strategy for the Treatment of ALS

**USF Tech ID# 17A028**

Patent Pending

- Therapeutic indication: Amyotrophic lateral sclerosis
- Mechanism of action: Blood-spinal cord barrier repair
- State of technology: *In vivo*

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Method of Treating Pathological Tau Aggregates by Inhibiting the HSP90 Activator AHA1

Novel Drug Target for Preventing Tauopathies

**USF Tech ID# 17A030**

Patent Pending

- Therapeutic Indication: Alzheimer’s disease, tauopathies
- Mechanism of Action: Inhibition of Aha-1
- State of Technology: *In vivo*

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Hexachlorophene, A Potential Therapeutic Agent for Treatment of Alzheimer's Disease and Other Tauopathies

Role of Hexachlorophene in Significantly Reducing Tau Levels for Alzheimer’s Disease Treatment

**USF Tech ID# 17A032**

Patent Pending

- Therapeutic Indication: Alzheimer's disease, tauopathies
- Mechanism of Action: Down regulation of phosphorylated tau
- State of Technology: *In vitro*

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GAS5 Mediated Metabolic Regulation in Neurodegenerative Diseases

Metabolic Approach to the Treatment of Neurodegenerative Disorders

**USF Tech ID#s 17A041 & 17A043**

Patent Pending

- Therapeutic indication: Neurodegenerative disease
- Mechanism of action: Increasing IncRNA GAS5
- State of technology: *In vivo*
CX3CR1 Agonists
A High Throughput Compound Screen to Identify Potential CX3CR1 Agonists

**USF Tech ID# 17A088**
Patent Pending

Therapeutic indication: Neuroinflammation and neurodegeneration reduction
Mechanism of action: CX3CR1 agonists
State of Technology: Compositions

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Novel Compounds for the Treatment of Neurodegenerative Diseases
Disrupted Brain Plaque Formation Which is Known to Cause Alzheimer’s Disease

**USF Tech ID# 17B152**
Patent Pending

Therapeutic indication: Neurodegenerative disease treatment
Mechanism of action: A new ligand: HW-C9 which disrupts amyloid beta peptides
State of Technology: In vivo

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N-Amino Peptide Beta-Sheet Mimics for the Treatment of Amyloid Diseases
Disrupted Amyloid Aggregation

**USF Tech ID# 17B153**
Patent Pending

Therapeutic indication: Neurodegenerative disease treatment
Mechanism of action: Short N-aminated peptides
State of Technology: In vitro

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SERP1/RAMP4 Reduction Facilitates Tau-Mediated Toxicity
Reduced Levels of SERP1 Increases Neurotoxicity in Alzheimer’s Disease and Other Tauopathies

**USF Tech ID# 18A089**
Patent Pending

Therapeutic indication: Neurodegenerative disease treatment
Mechanism of action: Elevated SERP1 levels to preserve neurons
State of Technology: In vivo
**Lithium Compositions**  
_Novel Ionic Co-Crystals of Lithium_

**USF Tech ID# 12B100**  
Patent Pending

**Therapeutic Indication:** CNS disorders  
**Mechanism of Action:** Increase brain bioavailability for lithium  
**State of Technology:** _In vivo_

**Technology Description:**  
Researchers at USF have successfully synthesized novel ionic co-crystals of lithium. Ionic co-crystals are driven by strong interactions and can lead to an enormous diversity in terms of composition. Specifically, the LiCl:L-Leucine (LiCLEU) compound was found to reduce elimination which resulted in sustained plasma lithium levels after a single dose. The plasma levels of LiCLEU continued in an upward trend even after 48 hours. This possibly blocks peripheral tissue distribution/elimination via Na+ pump. LiCLEU also increases brain bioactivity for lithium, which has great potential to treat a multitude of CNS disorders.

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**Exogenous Ketone Supplements**  
_Decreasing Anxiety by Inducing a State of Ketosis via Exogenous Ketone Supplements_

**USF Tech ID# 16A007**  
Patent Pending

**Therapeutic Indication:** Anxiety disorders  
**Mechanism of Action:** Reducing comorbidities  
**State of Technology:** _In vivo_

**Technology Description:**  
Exogenous ketone supplements can decrease anxiety by inducing a state of ketosis. Murine N2a cells were treated with LiCLEU (0 µM, 2.5 µM, 5 µM, 10 µM, 20 µM) and LiCl (20 µM) for 30 minutes. Cell lysates were analyzed by western blotting.

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**Lithium Salicylate as an Alternative Salt**  
_Improved Pharmacokinetics; Outperforms FDA Approved Lithium Therapies_

**USF Tech ID#s 13B166 & 14A039**  
US Patent Number: 9,744,189

**Therapeutic Indication:** Neuropsychiatric diseases  
**Mechanism of Action:** Produces elevated lithium plasma and brain levels without peak and rapid elimination  
**State of Technology:** _In vivo_

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**Technology Description:**  
Researchers at USF have successfully synthesized novel ionic co-crystals of lithium. Ionic co-crystals are driven by strong interactions and can lead to an enormous diversity in terms of composition. Specifically, the LiCl:L-Leucine (LiCLEU) compound was found to reduce elimination which resulted in sustained plasma lithium levels after a single dose. The plasma levels of LiCLEU continued in an upward trend even after 48 hours. This possibly blocks peripheral tissue distribution/elimination via Na+ pump. LiCLEU also increases brain bioactivity for lithium, which has great potential to treat a multitude of CNS disorders.
Cotinine for Treatment of Amyloid Associated Neurodegenerative Diseases
Reducing Toxic Effects of Aβ peptide on Brain Neurons

USF Tech ID# 08B085
Patent Pending

Therapeutic Indication: Post traumatic stress disorder, down syndrome, and Alzheimer’s disease
Mechanism of Action: Neuroprotective properties
State of Technology: In vivo, methods

Treatment of Suicidal Ideation and Behavior
Decrease Suicidal Ideation and Behavior in the Absence of Major Depression

USF Tech ID# 09B110
US Granted Patent #: 9,180,191

Therapeutic Indication: Suicidality
Mechanism of Action: Inhibition of nAChRs
State of Technology: Preclinical Data

Lithium Compositions as Pharmaceuticals
Are Able to Penetrate the Blood Brain Barrier and Exert Therapeutic Effects on the CNS

USF Tech ID# 11A015
Patent Pending

Therapeutic Indication: Suicidality and CNS diseases
Mechanism of Action: Penetrate Blood Brain Barrier
State of Technology: Compositions

Novel Ketamine Analogs
Ketamine Analogs with Unique Analgesic Properties Effective at 1/10 the Induction Dose

USF Tech ID# 11A044
US Granted Patent #: 9,073,819

Therapeutic Indication: Phantom pain, epilepsy, and depression
Mechanism of Action: Block NMDA receptors and selectively modulate GABAa receptors
State of Technology: In vivo, compositions
Neurodegenerative Disease Treatment with Umbilical Cord Blood
Potential Treatment of ALS

**USF Tech ID# 07B119**
**Patent Pending**

Therapeutic Indication: Amyotrophic lateral sclerosis
Mechanism of Action: Cell replacement; delay disease progression, reversal of symptoms
State of Technology: In vivo models

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Stem Cells From Menstrual Blood for the Treatment of Stroke
Autologous Stem Cell Source

**USF Tech ID# 08B121**
**US Patent Number:** 9,044,431

Therapeutic Indication: Ischemic stroke
Mechanism of Action: Cell transplantation; bystander effect
State of Technology: In vivo models

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LIF Protein Therapy for Stroke
Novel Therapeutic Approach To Treat Stroke

**USF Tech ID# 10A012**
**Patent Pending**

Therapeutic Indication: Stroke
Mechanism of Action: Protective of oligodendrocytes
State of Technology: In vitro

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Novel Treatment for Stroke at Delayed Time Points
Novel and Effective Treatment for Stroke

**USF Tech ID# 12A015**
**US Patent Number:** 9,636,311

Therapeutic Indication: Stroke
Mechanism of Action: Neural protection
State of Technology: In vivo models

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Menstrual blood-derived stem cell grafts detected in the ischemic penumbra near the necrotic core.
Conivaptan as a Treatment for Stroke
FDA-Approved Therapeutic Agent for Stroke

**USF Tech ID# 12A055**
Patent Pending

Therapeutic Indication: Stroke
Mechanism of Action: Decreases neural infarct size, edema and neuroinflammation
State of Technology: In vivo

Combination Therapy for Hypoxic-Ischemic-Like Injuries
Combination Therapy of Moderate Hypothermia, MSCs and DADLE

**USF Tech ID# 12B135**
Patent Pending

Therapeutic Indication: Hypoxic-ischemic-like injuries; stroke, cerebral palsy
Mechanism of Action: Moderate hypothermia and bone marrow-derived stem cell transplantation
State of Technology: In vitro

Use of Cotinine to Decrease Side Effects Induced by Chemotherapy and Radiation Regimens
Restore and Preserve Cellular Neuroplasticity

**USF Tech ID# 13A084**
Patent Pending

Therapeutic indication: Reduce side effects of chemotherapy and radiation
Mechanism of action: Improve mood and preserve synaptic density
State of technology: In vivo
**Combination Therapy for Traumatic Brain Injury**
*Cell and Drug Treatment for TBI and Related Diseases*

**USF Tech ID# 17A078**
**Patent Pending**

- **Therapeutic Indication:** Traumatic brain injury
- **Mechanism of Action:** Reduction in TBI induced neuronal degeneration and CCL20 expression
- **State of Technology:** *In vivo*

Combined treatment with the drug molecule and hMSCs significantly reduce neuronal degeneration.

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**Treatment of Traumatic Brain Injury Through the Use of Long Noncoding RNAs**
*Innovative New Therapy*

**USF Tech ID# 13B194**
**Patent Pending**

- **Therapeutic Indication:** Traumatic brain injury
- **Mechanism of Action:** Improve certain motor, cognitive, and histological deficits related to TBI and other related diseases
- **State of Technology:** *In vivo*

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