

Biomedical Technologies



otm.uic.edu
312.996.7018
otm@uic.edu



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Oncology/Hematology/Angiogenesis

Indication	Target	Therapeutic Description	Stage of Development	Patents	Faculty
Tumor & Ocular Angiogenesis	selective VEGF regulation through KAI	Peptide based inhibitor of VEGF activation	Preclinical: in vivo In vitro validation and early in vivo studies in a mouse lung cancer model	US Patent 11,299,524 AU Patent Allowed Nationalized in EP, NZ, JP and CN Divisional in SP	Kaori Yamada & Asrar Malik
Breast Cancer, Estrogen Positive	Estrogen Receptor	Brain penetrating Selective Estrogen Receptor Degraders	Preclinical: In vitro data, In vivo pending	PCT/US2019/01679 3 Nationalized in US, EP, CN, JP, SK and CN	Greg Thatcher, Rui Xiong & Debra Tonetti
Oncology	Initial data in metastatic breast cancer, as well as colon, liver, lung, prostate, and skin cancer	Engineered HSV oncolytic virus for cancer immunotherapy	Preclinical: in vivo Preliminary data confirmed in mouse models	PCT/US2019/03592 2 Nationalized in US, EP, AU, CN, SK, JP and IN	Bin He
Tumor & Ocular Angiogenesis	VEGF activation	Fusion peptide inhibitor based on Histatins	Preclinical: in vivo, in vitro, optimization studies	US Patent 10,800,822 Nationalized in EP, CN and JP	Vinay Aakalu
Prostate Cancer	PSA and TEM8	Vaccine combining a PSA (Prostate specific) peptide and a TEM-8 (Tumor endothelial marker 8) peptide plus GM-CSF	Phase I: PSA peptide vaccine Preclinical: in vivo PSA peptide vaccine/TEM-8 peptide - <i>in vivo</i> mouse data	US Patent 8,557,777	David Peace
Oncology	RAD51 DNA repair pathway	Inhibitors of RAD 51 DNA repair pathway as a target for cancer therapy	Preclinical: in vivo Compounds are validated in prostate cancer xenograft rodent models	PCT/US2013/07217 2 Nationalized in US	Alan Kozikowski & Philip Connell

Oncology/Hematology/Angiogenesis

Indication	Target	Therapeutic Description	Stage of Development	Patents	Faculty
Oncology	Syk Kinase	novel Syk inhibitors potently suppress the growth of leukemia cells and overcome resistance	Preclinical: In vitro validation	Provisional Filed	Won Hwa Cho
Oncology	Notch 4	Human Notch4 "Mini" Decoy	Preclinical: in vitro Small scale biologics produced	PCT/US2023/064896	Jan Kitajewski & Timothy Sargis
Ovarian Cancer	Unknown	Verticillins have shown promising anticancer qualities	Preclinical: in vitro Efficacy in killing ovarian cancer cell lines	Nationalized in US and EP	Joanna Burdette
Oncology, specifically Melanoma, MCL	HDAC6	Potent and Selective Inhibitors of Histone Deacetylase 6 (HDAC6)	Preclinical: in vivo Nexturastat series is the most advanced oncology validated HDAC inhibitor confirmed in melanoma animal models Hydroxamic acid	US Patent 10,456,394 US Patent 9,409,858 JP Patent Issued Nationalized in CA	Alan Kozikowski, SS Shen & Joel Bergman
Oncology	AKT E17K mutant	Akt E17K mutant-specific inhibitor	Preclinical: In vitro validation	Provisional Filed	Won Hwa Cho
Oncology	TrxR	TrxR inhibitors to treat cancer	Preclinical: In vitro validation	PCT/US2023/071043	Pavel Pasha Petukhov & Valentina Petukhova

Indication	Target	Therapeutic Description	Stage of Development	Patents	Faculty
Amyotrophic Lateral Sclerosis (ALS) and Alzheimer's Disease	Neuregulin Signaling	GlyB4 Fusion with Neuregulin Heparin-Targeting Domain to Block Neuregulin Signaling	Preclinical: in vivo Improves early chronic motor performance deficits, delays disease onset and prolongs survival in mouse models	US Patent 7,527,794 US Patent 7,994,123 EP Patent 1,824,879 PCT/US2020/012025	Jeff Loeb
PTSD, anxiety disorders, premenstrual dysphoria, & impulsivity	PPAR-alpha receptor	PEA induces an improvement of behavioral deficits by affecting the expression of target genes involved in cell proliferation, cell differentiation and in immune and inflammation responses	Preclinical: in vivo in vivo mouse models	US Patent 11,752,115	Graziano Pinna & Locci Andrea
Depression, Anxiety, & Fear	Allopregnanolone Stimulators	Derivatives of the neurosteroid allopregnanolone for non-responders of SSRIs	Preclinical: in vivo Early-stage in vivo mouse studies	US Patent 11,266,663 Nationalization US, EP, CA, and AU	Graziano Pinna
Parkinson's, Other Synucleinopathies	Protein Kinase C mu or Src-Family Tyrosine Kinase	Utilized a demonstrator compound as inhibitors of protein kinase C mu and src family tyrosine kinase	Preclinical: in vitro	US Patent 8,618,063	Scott Brady
Charcot Marie Tooth (CMT), Autism, Neuroprotection	HDAC6	Nanomolar inhibitors of HDAC6 highly selective over other HDACs	Preclinical: in vivo Compounds were dosed into transgenic models of CMT and successfully blunted the disease in a transgenic animal model	US Patents 10,456,394 and 9,409,858 JP Patent Issued Nationalized in CA and EP	Alan Kozikowski Duncan Wardrop

Neurology/Sleep Apnea

Indication	Target	Therapeutic Description	Stage of Development	Patents	Faculty
Pain Management	kappa Opioid Receptor	Kappa Opioid Receptor Agonist Derived from Akuammicine	Preclinical: Receptor binding validation	PCT/US2023/066050	Andrew Riley
Addiction	Nicotinic Receptor	Subtype Selective Nicotinic Acetylcholine Receptor Inhibitors	Preclinical: Receptor binding validation	PCT/US2022/083998 Nationalized in EP and US	Andrew Riley
Alzheimer's Disease	ABCA1	Non-Lipogenic ABCA1 Inducers for Type 2 Diabetes and Alzheimer's Disease	Preclinical: in vivo	PCT/US2022/020315 Nationalized in US and EP	Greg Thatcher Brian Layden Mary Jo Ladu
Niemann-Pick	Autophagy	Autophagy modulation with small molecules as a therapeutic strategy for neurodegenerative diseases	Preclinical: in vitro	Provisional Filed	Leslie Aldrich
Metabolic and neurological disorders	NAMPT activators	Enhancement of NAD through boosting of NAMPT activity or dietary supplementation alleviates AD symptoms in mice	Preclinical: HIT and Assay Optimization	PCT/US2022/023880 Nationalized in US	Rui Xiong, Gregory Thatcher, Kiira Ratia & Manel Ben Aissa

Metabolic/Wounds

Indication	Target	Therapeutic Description	Stage of Development	Patents	Faculty
Niemann-Pick	TMEM 97 or NPC 1	Small peptide (5 AA)	Preclinical: in vivo assays	PCT/US2021/033319 Nationalized in IL, JP, US, EP	Vinay Aakalu
Asthma, Eosinophilic Esophagitis	CCR3, eosinophils	Peptide therapeutic to compete against Eotaxin and other chemokines as a treatment for asthma	Preclinical: In vivo Experiments in eosinophil mouse model	US Patent 10,363,286 and 11,167,012 EP Patent Issued Nationalized in CA	Steven Ackerman & Vadim Gaponenko
Type 1 Diabetes	Targets both Notch3 and OX40 receptors on Tregs	Expansion of natural regulatory T cells by Jagged-1 and OX40L stimulation to suppress autoimmunity (through combination therapy or chimeric fusion protein)	Preclinical: in vivo Validated in NOD diabetes mouse model Seeking funding to expand studies and pursue human clinical trials	US Patents 10,696,946 Nationalized in US, EP and IN	Bellur Prabhakar
Wound Healing	CCR10	Wound healing peptide with a novel target that greatly reduces healing time	Preclinical: in vivo Diabetic mouse (<i>db/db</i>) model	PCT/US2020/043813 Nationalized in US, EP, CA, MX, JP and SK	Richard Minshall
Bone regeneration	Extracellular matrix	In vivo bioengineered exosome to create function/target specific and content release controlled exosome cargo	Preclinical: in vivo Preliminary proof of concept in rat calvarial defect model	PCT/US2019/042096 Nationalized in US, EP, AU, and CA	Sriram Ravindran
COPD, multiple sclerosis and diabetes	Inhibitors of Keap1/Nrf2 Protein-Protein Interaction	Mechanism is validated by empirical validation in rodent	Preclinical: in vivo	PCT/US2019/025464 Nationalized in US, EP, AU, CN, JP, CN	Terry Moore

Indication	Target	Therapeutic Description	Stage of Development	Patents	Faculty
Asthma, Eosinophilic Esophagitis	CCR3, eosinophils	Peptide therapeutic to compete against Eotaxin and other chemokines as a treatment for asthma	Preclinical: in vivo Eosinophil mouse model	US Patent 10,363,286 and 11,167,012 EP Patent Issued Nationalized in CA	Steven Ackerman & Vadim Gaponenko
Autoimmune diseases including Type 1 Diabetes, Lupus, RA	Targets both Notch3 and OX40 receptors on Tregs	Expansion of natural regulatory T cells by Jagged-1 and OX40L stimulation to suppress autoimmunity (through combination therapy or chimeric fusion protein)	Preclinical: in vivo Validated in NOD diabetes mouse model Seeking funding to expand studies and pursue human clinical trials	US Patents 10,696,946 Nationalized in US, EP and IN	Bellur Prabhakar
Hematopoietic stem cell transplantation	Multi-Chimeric Cell (MCC) Therapy for Transplantation and Treatment of Immune Deficiencies and Genetic Disorders	MCC enhances organ and HSC transplantation, constitutes fused HSC's from multiple donors. MCC address the key obstacle in expanding stem-cell therapies – donor matching. The special tolerogenic properties of MCC enable new avenues for stem-cell therapies.	Preclinical: in vitro	PCT/US2018/062736 Nationalized in US, EP, AU, CN, JP and CA	Maria Siemionow
Rheumatoid Arthritis, Inflammatory Bowel Disease, Ulcerative colitis	Epigenetics: HDAC6	HDAC6 Selective Inhibitors: nanomolar and sub nanomolar inhibitors of HDAC6	Preclinical: Potent HDAC6 inhibitors successfully prevented cardiac organ transplant rejection in rodent model; also prevented experimentally induced ulcerative colitis in rodents	US Patents 10,456,394 and 9,409,858 JP Patent Issued Nationalized in CA and EP	Alan Kozikowski Duncan Wardrop
Hematopoietic stem cell transplantation	GABA receptor	Repurposed drug/ GABBR1 agonist to improve HSC transplantation efficiency	Preclinical: in vivo Murine tested	US Patent 11,883,436	Owen James Tamplin
Fibrosis/ Osteogenesis	Cell therapy	Alginate coated mesenchymal stromal cell transplantation	Preclinical: in vivo Studies in rodent models of pulmonary fibrosis and bone regeneration	PCT/US2021/048343	Jae-Won Shin
Autoimmune diseases, allergies, bone marrow and organ transplant	Notch signaling	Mini-decoy proteins that bind Notch 1 and 4 receptors	Preclinical: in vitro	PCT/US2023/064896	Jan Kitajewski and Timothy Sargis

Cardio-Pulmonary

Indication	Target	Therapeutic Description	Stage of Development	Patents	Faculty
Sudden Cardiac Arrest	Phosphatase inhibitors	Peptide that aid in spontaneous recirculation and confer neuroprotection in the event of sudden cardiac arrest	Preclinical: in vivo Efficacy in mouse and pig models	US Patent 10,688,153 and 11,260,105 JP Patent 6,958,913 Nationalized in EP, CA and AU	Terry Vanden Hoek, Jing Li, & Xiangdong Zhu
Thrombosis/ sepsis	Von Willebrand Factor	Inhibitory peptide reduces the secretion of vWF, reducing risk of thrombosis and embolism.	Preclinical: in vitro and early in vivo studies	US Patent 9,796,757	Richard Minshall
Acute Respiratory Distress Syndrome/ Vascular leakage	End Binding Protein (EB3) inhibitors	Inhibitory peptide reduces interaction of EB3 with its receptor, decreasing endothelial permeability in response to pro-inflammatory mediators.	Preclinical: in vivo Studies in covid and no-covid induced ards completed	Provisional Patent Filed	Yulia Komarova
Fibrosis/ Osteogenesis	Cell therapy	Alginate coated mesenchymal stromal cell transplantation to treat pulmonary fibrosis	Preclinical: In vivo Studies in rodent models	PCT/US2021/048 343 Nationalized in US, EP, and CA	Jae-Won Shin
Pulmonary Arterial Hypertension	Visfatin/Pbef/ Nampt inhibition	Small molecule Inhibitors	Preclinical: In vivo Small molecules show efficacy against NAMPT Enzymatic activity	PCT/US2019/016 684 Nationalized in US and EP	Tom Driver
Pulmonary Arterial Hypertension	Nrf2-KEAP	Small molecules impacting Nrf2-KEAP interaction	Preclinical: proof of concept Small molecules show efficacy in wound healing proof of concept -target engagement model.	PCT/US2019/025 464 Nationalized in US, EP, CA, AU, JP and CN	Terry Moore

Anti-Infectives

Indication	Target	Therapeutic Description	Stage of Development	Patents	Faculty
Dental Caries/Biofilm inhibition	Bacterial pathogens that produce a biofilm matrix	Cerium (IV) nanoparticles that behave as biofilm inhibitors against the bacteria but not lethal to the cells at lower concentration.	Preclinical: in vitro Early stage, in vitro validation and cell toxicity evaluation	US Patent 10,835,556	Russell Pesavento
Lymphatic filariasis	Tetravalent filarial surface proteins	Vaccine (Purified Protein and/or DNA)	Clinical: ex vivo studies in a primate model of infection ongoing	US Patent 10,072,054 EP, CN, IN, SG Patents Issued	Ramaswamy Kalyanasundaram
Herpes	Viral binding and cell entry & HSV-1 and HSV-2	Inhibitory peptide & DECON particles	Preclinical: in vivo Validation in a mouse model of HSV infection	US Patent 9,464,113 & PCT/US2020/027299 Nationalized in US, EP, and CA	Deepak Shukla & Teja Yadavalli
Tuberculosis	ClpC1/P1/P2 complex	Rufomycin analogs with anti-tuberculosis activity	Preclinical: in vitro	PCT/US2022/012980 & US Patent Pending	Scott Franzblau
Schistosomes	TGR	Novel inhibitors of thioredoxin glutathione reductase (TGR) for the treatment of schistosomiasis	Preclinical: demonstrated lethality to parasite larvae and adults	PCT/US2023/071043	Pavel Pasha Petukhov
SARS-CoV-2 and Ebola	Neimann-Pick C1	Tubeimosides target Neimann-Pick C1 to inhibit SARS-CoV-2 and Ebola virus infection	Preclinical	Provisional filed	Yong-Hui Zheng
Antibiotics discovery	Research tool device	agar-flip plate for high-throughput discovery of antibiotics	Working prototype: Plates fabricated and in use in research	Provisional Filed	Sang Hyun Cho, Scott Franzblau, Brian Murphy, Jeongho Lee & Rui Ma
TB	Multiple	Macrolides and small molecule antibiotics	Preclinical: In vitro validation	US Patent 9,090,667 CN, JP, KR, IN, EP Patents Issued	Scott Franzblau

Indication	Target	Therapeutic Description	Stage of Development	Patents	Faculty
Drug Delivery/ Osteogenesis	Cell therapy	Methods to maximize production of EVs from MCSs, transport EVs through tissues, and immune evasive hydrogel coated MCSs.	Preclinical: in vivo studies in rodent models	PCT/US2021/048343 Nationalized in US, CA, and EP	Jae-Won Shin
Herpes	HSV-1 and HSV-2	DECON particles	Preclinical: in vivo	PCT/US2020/027299 Nationalized in US, EP and CA	Deepak Shukla & Teja Yadavalli
Drug Delivery	Cell Therapy	Engineered local lysis and permeabilization reagent for controlled drug delivery	Preclinical	PCT/US2022/032476	Chia Hao Mo
Drug Delivery	Extracellular matrix	In vivo bioengineered exosome to create function/target specific and content release controlled exosome cargo	Preclinical: in vivo Preliminary proof of concept in rat calvarial defect model	PCT/US2019/042096 Nationalized in US, EP, AU and CA	Sriram Ravindran
Drug Delivery	Non-specific	Toroidal-spiral design allows for two different drugs to be released at two different rates	Preclinical: in vitro data	US Patents 8,852,645 9,974,839	Ludwig Nitsche & Ying Liu
Drug Delivery	Zwitterionic polyethylenimine (PEI), polyaziridine or polyoxazoline for protein conjugation	Polymer conjugation to increase half life and reduce renal clearance and immune response, without compromising the characteristics of the protein	Preclinical: in vitro	PCT/US2019/035809 US Patent Pending	Gang Cheng
Drug Delivery	Non-specific	Continuous, scalable production of polymeric particles with novel heterogenous structures for cell and gene therapy	Preclinical: in vitro	PCT/US2021/048388 US Patent Pending	Ying Liu
Drug Delivery	Non-specific	Nano-hybrid delivery system for anticancer, anti-viral and anti-angiogenic agents	Preclinical: in vitro No animal data to date	US Patent 9,168,225	Seungpyo Hong
Drug Delivery and Protein Degradation	KB	KB tag- small, universal cellular uptake tag for cargo delivery and targetted protein degradation	Preclinical	Provisional filed	Alexander Adibekian & Dany Pechalrieu

Disease/Condition	Target/Marker	Stage of Development	Patents	Faculty
Epilepsy	Metabolite expression profile using MRI Spectroscopy	Identified in human epileptic brain tissue	US 11,350,870	Jeff Loeb
Pancreatic Cancer	Use of CA19-9, CEA, and CA242 for detection of pancreatic cancer using serum/blood	Preclinical: in vitro data	Provisional Filed	Mathew Mathew
Pancreatic Cancer	PCR-based assay using multiple data-driven targets to create an optimized model that can predict IPMN with high-malignant potential with up to 86% accuracy	Assay run on multinational human pancreatic cancer cyst fluid	PCT/US2018/02502 7 Nationalized in US, EP, CN, CA, AU and JP	Ajay Maker
Point-of-Care Diagnostic	in vitro data of multiple bacteria types	Novel Surface Chemistry of Filter Paper in Point-of-Care Detection/ Working prototype	PCT/US2020/03968 4 Nationalized in US and EP	Yajing Song & Peter Gyarmati
Bioanalysis and Imaging/Time-resolved fluorescence	Metal chelators	Working prototype	US Patent 10,961,197	Lawrence Miller & Ali Mohamadi
Viral detection from aerosol particles	BioAerium: Airborne monitor to detect SARS-CoV-2 and other viruses in airborne samples using nucleic acid amplification techniques	Working prototype	US Patent Pending	Igor Paprotny
Dry Eye Disease, Sjogren's GVHD	Histatin Biomarkers	Validated in a mouse model	PCT/2019/057807 Nationalized in US, JP and EP	Vinay Aakalu & Sandeep Jain
Peptide Biomarkers	Dry eye Syndrome diagnostic and also therapeutic	Proof of concept	PCT/2019/057807 Nationalized in US, JP and EP	Vinay Aakalu & Sandeep Jain
Idiopathic Pulmonary Fibrosis	Peripheral blood biomarkers	Validated in a small set of human samples	US Patent 10,036,069	Joe Garcia
Cellular Lipids	In Situ Quantitative imaging with specific molecular sensors for detection from Cholesterol to Cancer	Demonstration of several in situ molecular sensors	Material License	Wonhwa Cho

Disease/Condition	Target	Target/Marker	Stage of Development	Patents	Faculty
Dry eye, retinopathy, angiogenesis	VEGF Activation	Fusion peptide inhibitor based on Histaminesm. Applications in wound healing, metal ion chelation, anti-inflammatory effects and angiogenesis	Preclinical: In vitro data, In vivo data in mouse	PCT/US2016/063906 US Patent 10,800,822 11,370,816 Nationalized in EP, CN and JP	Vinay Aakalu
MEK inhibitors, Corneal Scarring, Ocular Angiogenesis	Therapeutic targeting Aniridia associated with PAX6 deficiency	MEK inhibitors can limit the corneal scarring, opacification and neovascularization in severe corneal injury and disease	Preclinical: In vivo mouse data	US Patent Pending	Ali Djallilian
Peptide Therapeutic	Functional Pentapeptide for Treatment and Diagnosis of Human Disease	A new pentapeptide compound that enhances epithelial wound healing (multiple surfaces) and is positively associated with the histatin peptide-family to promote similar effects	Preclinical: In vivo mouse data	PCT/US2020/062140 Nationalized in US, EP, CN and JP	Vinay Aakalu
Tumor & Ocular Angiogenesis	selective VEGF regulation through KAI	Peptide based inhibitor of VEGF activation	Preclinical: In vitro validation and early in vivo studies in a mouse lung cancer model	PCT/US2017/049584 US Patent 11,299,524 AU Patent Allowed Nationalized in EP, NZ, SG, JP, CN	Kaori Yamada & Asrar Malik
AMD (also sepsis, cancer and inflammatory disorders)	End-binding 3 protein	IP3R derivative peptide targeting the inhibition of EB3 to treat AMD as lead indication with additional data demonstrating benefits for therapeutic efficiency in sepsis, allergy/asthma and inflammation	Preclinical: in-vivo small animal and non-human primate data for AMD in vivo small animal for sepsis, allergy/asthma and inflammation	PCT/US2012/042118 Allowed or issued patents in US and 30 countries worldwide	Yulia Komorova
Peptide Biomarkers	Dry eye Syndrome diagnostic and also therapeutic	Biomarker, diagnostic, and potentially therapeutic, for ophthalmic or other system diseases especially those associated with inflammation, derangement in immunity, oncologic changes, infection, and wounding	Preclinical: some animal data	PCT/US2019/057807 JP Patent JP7281835B2 US and EP Patents Pending	Vinay Aakalu & Sandeep Jain
Diabetic Retinopathy	NAMPT enzymatic activation to increase concentration of NAD in the eye.	Decrease in NAD+ levels is attributed to an imbalance between NAD+ synthesis and consumption given that the expression and activity of enzymes critical to NAD+ synthesis decline with increasing age despite the fact that the obligatory requirement for NAD+ remains high	Preclinical: Compounds have been biochemically confirmed to increase enzymatic Kcat for NAD+ production	US Patent 11,584,766 US Patents Pending	Kiira Ratia Greg Thatcher and A. Kazlauskas

Ophthalmology Devices

Device	Function	Stage of Development	Patents	Faculty
Corneal Blindness	Medical Device	Prototype	US Patent 11,376,163 EP Patent Pending	Mark Rosenblatt & Charles Yu
Ophthalmology	Intra-vitreous injections	Prototype; animal data	PCT/US2020/060898 Nationalized in US and EP	Yannek Leiderman
AI Classification of Diseases	Artificial intelligence classification methodology to differentiate between normal and diseased states of ocular conditions	AI model developed from clinical data	PCT/US2020/022774 Nationalized in US and EP	Xincheng Yao
Non-contact non-mydratric fundus camera Ultra wide angle	By freeing the pupil for collecting imaging light only, trans-pars-planar illumination enables >200ofundus view in single-shot images	Prototype; human data	PCT/US2018/037281 Nationalized in US, CN and EP	Xincheng Yao
Multimodal OCT for concurrent imaging of retinal neural activity and vascular hemodynamics	Fosters the study of neurovascular coupling mechanisms in the retina, providing a new method for retinal disease detection and diagnosis.	Prototype; human data	US Patent Pending	Xincheng Yao
Novel Keratoprotheses	Sutureless Keratoprosthesis with flexible component for treatment of corneal blindness	Prototypes; rabbit data	US Patent 11,446,137 EP Patent Pending	Mark Rosenblatt & Charles Yu
Miniaturized indirect ophthalmoscopy	Miniaturized indirect ophthalmoscopy for wide-field fundus photography.	Prototype; human data	US Patent 11,484,198 Issued Patents in EP and CN	Xincheng Yao
Optical coherence tomography angiography	OCT feature analysis guided artery-vein differentiation in OCTA	AI model developed from clinical data	PCT/US2020/022774 Nationalized in US and EP	Xincheng Yao
Microsurgery OCT guidance	Optical Coherence Tomography Image-Guided Microsurgery of the Eye	Prototype	PCT/US2020/017425 Nationalized in US, EP and AU	Yannek Leiderman
Contrast Sensitivity Chart	diagnostic tool for assessing contrast sensitivity in a subject	Final product	US Patent 11,712,159	Jason McAnany

Medical Devices

Device	Function	Stage of Development	Patents	Faculty
Catheters	Catheter head design for use in the suprachoroidal space	The complete navigational system was tested in various models to demonstrate functionality, including tip articulation, obstacle maneuvering and avoidance, and targeted delivery of a payload.	PCT/US2020/060898 Nationalized in US and EP	Anthony Felder
Stroke Rehab	A Soft Exoskeletal Network of Elastic, Nonlinear Torque Field Generators for Neurorehabilitation	Simple, customizable tool capable of providing assistive torques to patients with motor deficits	PCT/US2020/038631 US Patent Pending	James Patton
Operating table Patient Stabilizer	Operating table for procedures in the Trendelenburg position to reduce stress on nerves and prevent musculoskeletal injury	Prototype	PCT/US/2019/029495 Nationalized in US, EP and AU	Michael Young
Spine	Method and device for delivering solution to posterolateral fusion: Medicant delivery in a fenestrated rod of the posterolateral fusion fixation system	Device build and physically tested	PCT/US2020/038127 US Patent Pending	Ankit Mehta & Philip Ostrov
Ankle Stroke Rehab Device	Affordable at-home digital rehabilitation device for post-stroke ankle recovery.	Prototype	PCT/US2019/061264 Nationalized in US, EP, CA, KR and SG	Sangeetha Madhavan
Extendable Intravenous Catheter	A catheter designed for pediatric patients	Prototype being developed	US Patent 9,517,324	Girish Desphande

Medical Devices

Device	Function	Stage of Development	Patents	Faculty
Catheter tubing	Biocompatible, non-biodegradable and antifouling polyurethane	In vitro/early in-vivo	PCT/US2019/028296 Nationalized in US, EP and CN	Gang Cheng
Device for insertion of spinal cord stimulation paddle electrodes	This device decreases pressure on the midline spinal structures, primarily the spinal cord, and instead main pressure points will be at the lateral aspects of the spinal canal, away from the spinal cord itself	Theoretical concept exists	US Patent 9,351,752	Konstantin Slavin
Protective Mesh of Proximal Ventriculoperitoneal Shunt	Device that prevents debris from clogging the shunt tubing in Hydrocephalus patients	Early prototype exists	Provisional Filed	Ankit Mehta
DuraClose	Device that repairs tears/punctures in the dura mater	Early prototype exists	US Patent Pending	Ankit Mehta
Rapid Pathogen ID	Instrument free detection of pathogens from small blood sample	Prototype	PCT/US2020/039684 Nationalized in US and EP	Peter Gyarmati
Type I Diabetes	Novel islet transport	Mathematical Model	Algorithm/ Research Tool	Jose Oberholzer

Medical Imaging

Image application	Technology description	Patents	Faculty
MRI	MRI with sub-millisecond temporal resolution for cardiac valve imaging and scanner calibration (Eddy current)	US Patent Allowed	Joe Zhou
MRI	Method for Correcting Geometric Distortion in Echo-Planar Magnetic Resonance Imaging	PCT Patent Pending	Joe Zhou
MRI	Rapid MRI with High Motion Tolerance	US Patent 9,645,211	Joe Zhou
MRI	Time-Efficient Phase Error Correction in EPI-PROPELLER	US Patent 9,612,307	Joe Zhou
MRI	Method for Reducing Image Distortion in Echo Planar MRI	US Patent 9,797,970	Joe Zhou
Lattice Light-Sheet	Lattice Light-Sheet and Fresnel Incoherent Correlation Holography	PCT/US2021/017102 US and EP Patents Pending	Simon Trevor Alford
MRI	Tagging distance dependent Z-spectral (TADDZ) MRI for B0-corrected arterial spin labeling (ASL) imaging	US Patent Allowed	Kejia Cai
MRI	Methods for Reducing Fold-Over Artifacts in Magnetic Resonance Imaging	US Patent 8,847,594	Joe Zhou
MRI	3D reduced Field-of-View imaging	PCT/US2022/035187 Nationalized in US and EP	Joe Zhou

Title	Target or Indication	Description	Stage of Development	Intellectual Property	Faculty
DEEP	Diabetes	This is a diabetes education and self-management program endorsed by CMS	Commercially deployed https://mwlatino.uic.edu/deep-program/	Copyright	Amparo Castillo
Fit & Strong	Osteoarthritis	An evidence-based exercise program to treat osteoarthritis. This program is currently being taught in almost 100 sites in 24 states.	https://www.fitandstrong.org/	Copyright	Susan Hughes
LUMEN	Depression and Anxiety	AI voice-based virtual coach for behavioral therapy with promising evidence that virtual therapy could help address gaps in mental health care	Working app and multiple clinical trials	Copyright	Jun Ma
CATCH-IT	Adolescent depression	Evidence based computerized cognitive behavioral therapy for depressed adolescents	Clinical trials with patients have been conducted. doi: 10.1097/DBP.0b013e3181966c2a	Copyright	Benjamin Van Voorhees
LUPUS- PRO	SLE Lupus	Patient Reported Outcomes Questionnaire	Used by pharmaceutical and clinical units to gauge disease severity	Copyright	Alan Simon Pickard Meenakshi Jolly
Medicinal Cannabis Technical Manuals	Medical Marijuana/Cannabis	Laboratory protocols describing the processing of medical cannabinoid products	Turn-key validated protocols	Copyright	Jennifer Bash
Academic Detailing Surveys	Opioid Death Prevention Counselling	Academic Detailing: a comprehensive and novel method of educational outreach designed to arm providers with current evidenced-based information through individual face to face interactions between PharmD professionals and patients.	Available for Licensing from UIC	Copyright	Simon Pickard and Todd Lee

Title	Target or Indication	Description	Stage of Development	Intellectual Property	Faculty
Asthma, Eosinophilic Esophagitis	CCR3, eosinophils	Peptide therapeutic to compete against Eotaxin and other chemokines as a treatment for asthma	Preclinical: in vivo Eosinophil mouse model	US Patent 10,363,286 and 11,167,012 EP Patent Issued Nationalized in CA	Steven Ackerman & Vadim Gaponenko
Amyotrophic Lateral Sclerosis (ALS) and Alzheimer's Disease	Neuregulin Signaling	GlyB4 Fusion with Neuregulin Heparin-Targeting Domain to Block Neuregulin Signaling	Preclinical: in vivo Improves early chronic motor performance deficits, delays disease onset and prolongs survival in mouse models	US Patent 7,527,794 US Patent 7,994,123 EP Patent 1,824,879 PCT/US2020/012025	Jeff Loeb
Niemann-Pick	TMEM 97 or NPC 1	Small peptide (5 AA)	Preclinical: in vivo assays	PCT/US2021/033319 Nationalized in JP, US, and IL	Vinay Aakalu
Charcot Marie Tooth (CMT), Autism, Neuroprotection	HDAC6	Nanomolar inhibitors of HDAC6 highly selective over other HDACs	Preclinical: in vivo Compounds were dosed into transgenic models of CMT and successfully blunted the disease in a transgenic animal model	US Patents 10,456,394 and 9,409,858 JP Patent Issued Nationalized in CA and EP	Alan Kozikowski & Duncan Wardrop
Fertility	SIK	SIK inhibitor for enhancing fertility	Preclinical	US Patent 11,690,897	Carlos Stocco
Proteus Syndrome	Very specific to the mutated AKT E17K mutation that causes Proteus Syndrome	Highly potent and highly specific Akt1-E17K inhibitor for the treatment of Proteus Syndrome and potentially highly proliferative cancers.	Preclinical: in vivo	Provisional application	Wonhwa Cho

Startups

Company	Technology	Website	Type	Faculty	Stage of Development
5by5	Novel Surgical Stations		Device	Pier Giulianotti	Seed stage startup
Actuate Therapeutics	Highly Selective GSK3 inhibitors for Oncology and CNS indications	https://actuatetherapeutics.com	Therapeutic	Alan Kozikowski	Received \$90M in investment; undergoing Phase II clinical trials, several indications
Advaita	Anti-inflammatory in ocular surface diseases	http://advaita.com/	Therapeutic	Sandeep Jain	Seed stage startup
Bright Minds Biosciences	Novel biased agonists of the human 5HT2c receptor targeting multiple CNS indications	https://brightmindsbio.com/	Therapeutic	Alan Kozikowski	Post IPO company raised \$20M, starting Phase I clinical trial in May 2022
Capio Biosciences	Circulating tumor cell capture device for diagnostic applications. Successfully raised \$2M in start up funding.	http://www.capiobiosciences.com/	Diagnostic	Seungpyo Hong	Post IPO company raised \$20M, starting a Phase I clinical trial in May 2022
Cell Biologics	Therapeutics for treating sepsis and other pulmonary indications; primary cultured cells and cell culture products	http://www.cellbiologics.com	Therapeutic & Reagents	Asrar Malik	Seed stage company with multiple STTR grants over \$1.8M
Drax Therapeutics	Biotechnology company developing small molecule inhibitors of NAMPT as disease modifying therapeutics for Pulmonary Arterial Hypertension.	https://research.impact.iu.edu/our-strengths/innovation-commercialization/ico-pipeline.html	Therapeutic	Tom Driver and Roberto Machado	STTR based, preclinical assets
DuPage Medical	Peptide based anti-thrombotics that don't cause bleeding	https://dupagemt.com/	Therapeutic	Xiaoping Du	Seed stage company with multiple non-dilutive grants including VITA and SBIR grants totaling over \$6M
Dystrogen Therapeutics	Chimeric Cell Therapy for Treating Muscular Dystrophy including Duchenne Muscular Dystrophy (DMD)	http://dystrogen.com/	Therapeutic	Maria Seimionow	1 st in-human trial
Enzyme by Design	Safer asparaginase proteins that have been designed to minimize glutaminase activity for treating cancer	https://www.enzymebydesign.com	Therapeutic	Arnon Lavie	Seed stage corporation with multiple STTR grants over \$4M

Startups

Company	Technology	Website	Type	Faculty	Stage of Development
EpiDestiny	Decitabine formulation for treating blood related cancers and indications including sickle cell anemia	https://www.epidestiny.com	Therapeutic	Yogen Saunthararajah & Joe DeSimone	Partnered with Novo Nordisk for Sickle cell disease programme (Phase I completed), Phase II clinical trials initiated for myeloid malignancies, peripheral T-cell leukemia/lymphoma, and small cell lung cancer (seeking partnership).
FertilityABC	Software (app) for primary care physicians, their patients, and Resident physicians to provide guidance on methods besides in vitro fertilization to increase opportunity/likelihood for pregnancy		Software Application	John Holden	App beta testing ongoing
Keywise Inc.	A smartphone application that enables monitoring of non-verbal speech using keyboard dynamics, meta-data, and related mobile sensor information to infer the users' neuropsychological state	https://keywise.tech/	Health IT Software	Alex Leow Olusola Ajilore Faraz Hussain	App beta testing ongoing
Nano Biotherapeutics Inc.	Diagnosing or Treating Neutrophil-Mediated Inflammatory Disease	http://www.nanobiotherapeutics.com	Therapeutic	Asrar Malik	Seed stage company with multiple STTR grants over \$1.7M
NS Intelligence IP	Non-contact videoplethysmograph (VPG) measure of human arterial pulse using a digital camera		Diagnostic	Stephen Porges	
PAX Neuroscience	Blood based test for evaluating antidepressant efficacy and diagnosing depression	http://www.paxneuroscience.com	Diagnostic	Mark Rasenick	Preseed company, working in depression diagnostics
Pearl Bio	Harnessing the power of synthetic biology to build next-gen biomaterials for smart biologics. Pearl Bio's proprietary technology couples genome and ribosome engineering to produce novel biologics with diverse chemistries previously inaccessible to science.	https://www.pearlbio.com/	Therapeutic, Drug Discovery	Alexander Shura Mankin, Cedric Orele & Teresa Szal	Executed a \$1 Billion exclusive license agreement with Merck.
RespireRX	Novel drug therapies for sleep apnea, drug-induced respiratory depression, and other brain-mediated breathing disorders	http://www.respirerx.com	Therapeutic	David Carley	RespireRx Pharmaceuticals has raised a total of \$12.2M in funding over 5 rounds.

Company	Technology	Website	Type	Faculty	Stage of Development
Revivo Therapeutics	Novel methylthiazoles for CNS indications with the lead molecule well tolerated in a Phase 1 study in healthy volunteers	http://www.revivotherapeutics.com	Therapeutic	Greg Thatcher	Seed stage company with \$3M in funding, seeking further venture funds
Selagine	Antibody based biologics for eye diseases	https://www.selagine.com/	Therapeutic	Sandeep Jain	Seed stage startup
SENEX Bio	Biotechnology company pivoting on development of novel kinase inhibitors for oncology, Senex is developing highly selective small-molecule inhibitors of this protein for the treatment of presently incurable types of prostate cancer, breast cancer and leukemia	https://senexbio.com/	Therapeutic	Igor Roninson & Karthik Gopalakrishnan	Company is repivoting on a new platform and raising seed stage investment
Syntax	Biotech developing a proprietary CRISPR/Cas9 based, genetic programming platform technology that converts cells into biological computers using DNA based instructions that read like lines of codecompany leveraging next generation CRISPR in therapeutics and food science.		Therapeutic & Food Science	Brad Merrill & Ryan Clarke	Supported by Portal Innovations, raising seed \$5M
Tianhe Stem Cell Biotechnologies	Stem Cell Educator Therapy is a treatment of autoimmune related diseases using stem cells drawn from human umbilical-cord blood	http://www.tianhecell.com	Device & Therapeutic	Yong Zhao	Phase 2 clinical trial initiated for Type 1 Diabetes, Alopecia Areata, and Covid 19
TTC Oncology	Clinical stage hormone receptor modulators for treating cancer	https://www.ttconology.com	Therapeutic	Greg Thatcher	Completed Phase I trials with \$5M captilization, seeking additional funds
ViSoTherapeutics	Histatin Peptides		Therapeutic	Vinay Aakalu	Seed stage startup
Yaso Biotech	Therapeutic and prophylactic agent for sexually transmitted viral pathogens with contraceptive properties	http://www.yasotherapeutics.com	Therapeutic	Alex Kronic & Don Waller	STTR phase company with \$5M raised, seeking venture capital