
INDUSTRY
INVENTORS
INVESTORS
3RD ANNUAL
UCLA
MEDICAL DEVICE
PARTNERING
CONFERENCE
TUESDAY MARCH 10, 2015
CNSI—UCLA CAMPUS
UCLA / OIP-ISR

Conference Program

9:15 am	**REGISTRATION/NETWORKING**
10:00 am	**WELCOME**—Emily Waldron Loughran
10:15 am	**INVESTORS PANEL Medical Device Startup Funding** RCT Ventures I Johnson & Johnson Innovation I Life Science Angels I Seroba Kernel Life Sciences IEnterprise Ireland I The Brenner Group
11:30 am	**TRENDS IN HOSPITAL PURCHASING OF MEDICAL DEVICES** UCLA Health I Kaiser Permanente
12:15 pm	**LUNCH**
1:15 pm	**STARTUP COMPANY PITCHES** Bone-Rad Therapeutics I Bruin Biometrics I Fluid Synchrony I QT Medical
2:15 pm	**NETWORKING OPPORTUNITIES**
2:45 pm	**STARTUP COMPANY PITCHES** CaliCast I Cayuga Biotech I GI Logic I Platinum Group Coatings
3:45 pm	**NETWORKING/EVENT CLOSE**

Contents

Richard M. Brenner

President & C.E.O.
The Brenner Group, Inc.

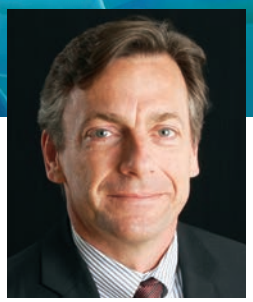
Rich Brenner founded The Brenner Group, Inc.® (www.thebrennergroup.com) in 1987. The Brenner Group is a financial services firm providing outsourced financial executives, financial advisory services and shareholder representative services and serves as CEO.

He has also been an active angel investor in and around Silicon Valley for many years.

One of these investments is Bridge Capital Holdings, the parent company of Bridge Bank, where Rich is a founder, Director Emeritus, former member of the Board of Directors and former Chairman of the Audit Committee. Recently, he has focused his Angel Investing in the life sciences sector.

He has worked in general and financial management, and has assisted many emerging companies in the roles of President, General Manager, Vice President and Chief Financial Officer. He has held executive level positions at Formaster Corporation, Corvus Systems Inc., US Leasing International Inc., ITEL Corporation, National BankAmericard (now VISA) and Autographic Business Forms Inc. He also served as venture capital consultant to Hillman Ventures.

Rich is, or has served, as a board member at Affymax, Inc., e-Nicotine, Inc., Sandstone Diagnostics, Inc., PartMiner, Inc. Vida Systems, Inc., Vello Systems, Inc., Abound Logic, Inc., Pavad Medical Systems, Inc. Cardiovention, Inc., Chadmoore Wireless Group and QuickHealth.



Andy DelGesso

Executive Director and Medical Portfolio Manager
Kaiser Permanente

Andy DelGesso is an Executive Director and Medical Portfolio Manager in Procurement & Supply at Kaiser Permanente. In addition to managing $1.5B in purchases of medical products, equipment and services, he is active in Business Strategy Development, Digital Health Integration, Supplier Relationship Management, and Outsourced Services Management.

Andy has 20 years of experience in Strategic Sourcing and Supply Chain functions, both in the U.S. and abroad. His background includes work in many industries, including healthcare, IT, automotive, agriculture, & manufacturing.

Andy holds a bachelor's degree in Business from Villanova University and is fluent in Japanese.

Norm Gitis, PhD

Managing Partner, Lymo Ventures
Screening Committee Chair, Life Science Angels

Norm Gitis obtained his PhD in Engineering from the USSR Academy of Sciences in Moscow. Upon immigration to the US, he was a visiting professor at MIT until IBM moved him to San Jose. He worked in the disk drive industry, at IBM and then Maxtor.

Norm founded and ran two high-tech companies, Center for Tribology, Inc. in Mountain View (1994–2000) and CETR in Campbell (2000–2011). He was twice named by the Business Journal the CEO of Top 20 Fastest Growing Private Companies in Northern California.

Norm has authored over 150 scientific papers, three books and over two dozen patents, chaired and organized over three dozen international scientific conferences.

Over the past three years, Norm has been pursuing his passion of helping technology-based start-ups with funding, IP and business development. Norm chairs a screening committee of Life Science Angels and serves on a screening committee of the Band of Angels.

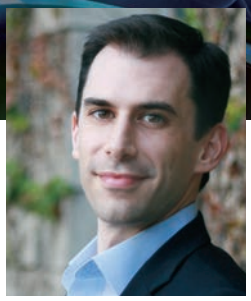
Paul M. Grand

Managing Director
RCT Ventures

Paul M. Grand is a Managing Director for RCT Ventures. At RCT, he is responsible for sourcing RCT's investments in medical devices and representing RCT on the boards of its portfolio companies. Grand serves as Producer and Master of Ceremonies for the annual MedTech Idol competition that seeks to identify outstanding early-stage MedTech opportunities.

Grand has extensive experience in new company formation and operations. Prior to joining RCT, Grand founded and operated eight high technology, medical device, and biotechnology companies. In the life sciences, Grand was co-founder and VP of Operations of Imagine Pharmaceuticals, and co-founder and CEO of MicroSurgeon in Los Angeles.

Grand is actively involved in programs to encourage bio-entrepreneurship, innovation, and commercialization of University technologies. He is on the Oversight Committees for the Coulter Translational Research Partnership Programs at USC and University of Washington. Grand is a reviewer for proof of concept and commercialization-focused funding programs for the University of California system, USC, University of Utah, and University of Colorado.



Thomas Lipkin, PhD

Head of New Ventures
UCLA OIP-ISR

Thomas Lipkin joined UCLA's OIP-ISR in 2012 and serves as Head of New Ventures. Dr. Lipkin and his team work to further the entrepreneurial environment at UCLA by building startup companies around UCLA's intellectual property, serving as a resource to faculty members, aiding existing UCLA startups in sourcing financing and talent, and helping secure additional funding for campus-wide startup initiatives. Dr. Lipkin is also responsible for actively promoting UCLA's intellectual property assets and engaging with parties interested in further developing early-stage technologies in the life sciences, physical sciences, and internet technology space. Previously, Dr. Lipkin was with Osage University Partners, a venture capital fund that invests exclusively in university-based startup companies. Dr. Lipkin received his B.S. in Biology from Indiana University and his Ph.D. in Cell Biology and Pathology from Columbia University.

Emily Waldron Loughran

Director of Licensing
UCLA OIP-ISR

Emily Loughran joined UCLA's OIP-ISR in 1994 as a technology transfer officer. Currently, as the Director of Licensing, she manages the licensing and patent prosecution groups, and oversees the office's large portfolio of invention disclosures, patents, and license agreements. Emily started in intellectual property administration at the City of Hope Medical Center where she was the Technology Transfer Manager responsible for patenting and licensing activities. Emily holds an MBA from USC and a BS from UC Berkeley.

Jennifer McKeever, MSc, BSc

Senior Investment Analyst
Seroba Kernel Life Sciences

Jennifer McKeever joined the team of Seroba Kernel in 2011. She graduated from University College, Dublin with an honours degree in Pharmacology in 2010. Jennifer then entered a Master's degree programme in Biotechnology and Business to further her interest in the interface of biomedical science with commercialisation. Having placed first in her Master's degree in 2011, Jennifer then joined Seroba Kernel's Investment Team as an Investment Analyst. Jennifer is a member of the Sandbox network, a global community for 'exceptional innovators' and she guest-lectures on venture capital at University College Dublin, Trinity College Dublin and the Royal College of Surgeons, Ireland. Jennifer was promoted to Senior Analyst in 2014.

Seroba Kernel is a European life sciences venture capital firm, focused on investing in breakthrough healthcare technologies that promise to improve lives and make a difference worldwide. Headquartered in Ireland, we work with some of Europe's best entrepreneurs developing innovative medical devices, diagnostics and therapeutic drugs.

Brian O'Neill, PhD, MBA

Manager, High Potential Start-Ups, Industrial & Lifesciences, High Growth Scaling Unit
Enterprise Ireland

Brian O'Neill is the Head of Industrial & Lifesciences High Potential Start-Ups for Enterprise Ireland—the Government of Ireland's Trade and Technology Agency responsible for the internationalisation of indigenous Irish industry. Brian has spent over 20 years working with the lifesciences sector in Ireland and internationally in a variety of private sector/government roles ranging from basic to applied research through to entrepreneur, technology transfer specialist, lifesciences business development adviser and Head of the indigenous Irish sector.

In his current role Brian and his team are responsible for the development and implementation of the strategic plan required to drive the continued growth of Ireland's vibrant start up community together with accelerating the global expansion of Ireland's most successful businesses. In addition, he plays a key role in shaping the Irish ecosystem to ensure its long-term development and evolution.

Brian had a PhD in Human Molecular Genetics from Trinity College Dublin, Ireland and a 1st Class Honours Masters of Business Administration from University College Dublin, Ireland.

For further information on Enterprise Ireland, please see www.enterprise-ireland.com

Jenell Paul, MSN, RN

Clinical Procurement Specialist
UCLA Health

Jenell Paul has been employed at UCLA Health for 18 years. She has worked in both the inpatient and operational areas. Currently she is responsible for value analysis initiatives, including new technology assessments, contracting, evaluations, and product conversions, for the UCLA Health System. Jenell contributes to clinical quality of care by assessing introduced products for compliance with the UCLA goal to deliver patient-focused, cost-effective, quality care. She is the Clinical Procurement Specialist and Value Analysis Coordinator for the UCLA Health System.

Renee Compton Ryan

Vice President
Venture Investments
Johnson & Johnson Innovation—JJDC

Renee Compton Ryan joined Johnson & Johnson Innovation—JJDC, Inc. (JJDC) in 2011. She is based in Silicon Valley, California and primarily supports the strategic investment activities in medical devices and diagnostics.

Mrs. Ryan's background includes over 20 years of healthcare investment banking. Most recently, she ran the medical device investment banking effort at R.W. Baird & Co. Previously, she lead the West Coast medical device group at Jefferies & Co. and was in the healthcare investment banking groups at Goldman Sachs and Credit Suisse.

Mrs. Ryan received an MBA from Columbia Business School and a Bachelors degree from Georgetown University.

Bone-Rad Therapeutics, Inc.

http://www.bone-rad.com/

Bone-Rad Therapeutics, has developed a proprietary Brachytherapy Bone Cement for the treatment of bone tumors. Bone-Rad's first product, Spine-Rad™ Cement, will simplify the treatment paradigm for cancer tumors of the vertebrae. The current treatment for vertebral tumors is a two-step process starting with vertebroplasty or kyphoplasty to strengthen the bone, followed by 10-20 visits for external beam radiation therapy (EBRT) to kill the tumor. Spine-Rad Cement, which incorporates a radionuclide, is injected into the vertebral body as part of a standard kyphoplasty procedure and delivers a therapeutic radiation dose to the tumor while simultaneously strengthening the vertebral body. Spine-Rad will eliminate the 10-20 hospital visits typically needed for EBRT, making the treatment of vertebral tumors less expensive, while dramatically reducing the unpleasant side effects associated with EBRT and greatly improving patient care and quality of life.

bruin BIOMETRICS

http://bruinbiometrics.com/

Bruin Biometrics, LLC (BBI) was founded in 2009 on the insight that sensing technology could be developed to detect and monitor diseases earlier and with greater diagnostic certainty than prevailing methods. BBI identifies, develops and commercializes devices that use biometric sensors to noninvasively measure bodily changes that are indicative of the early stages and progression of disease states. These biomarkers offer new, immediate, inexpensive and clinically valuable medical data at the point of care.

BBI's lead product—the SEM Scanner™ — is a revolutionary, sensor-based medical device which received CE mark in Europe in 2013, for the detection of early stage Pressure Ulcers and suspected Deep Tissue Injury. With up to 91% true positive and 86% of true negative performance, The SEM Scanner™ Makes Pressure Ulcer Prevention Possible.

CaliCast™

Traditional casts are bulky, smelly, uncomfortable, subject to molding and degradable in water. CaliCast is a next generation cast and turn-key casting system which uses biocompatible, nontoxic, blue light activated polymers to create a strong, thin, porous, quick drying and breathable casts for any body part. With CaliCast the wearer may swim and bathe as well as feel less encumbered due to the thin, low profile design which will allow enhanced mobility and ease of movement. There are currently casts on the market that advertize as water compatible but have shortfalls which the CaliCast design overcomes. The two competing products use a waterproof liner under the traditional fiberglass and drain at each end. CaliCast on the other hand does not need the fiberglass layer and also breathes without requiring draining. The compact and breathable nature of CaliCast makes it particularly attractive for the pediatric, geriatric, military and veterinary markets where compactness and water compatibility are pains that CaliCast can relieve. Furthermore Calicast is cost competitive with the two other products in the waterproof cast space. CaliCast has a line of products planned to address the needs of the active orthopedic patient of any age or species!

Cayuga Biotech

http://www.cayugabiotech.com/

Trauma and hemorrhage are intertwined conditions that account for the number one cause of death and disability worldwide. In the US, blood loss is the #1 cause of death on the battlefield and #2 cause of death in US civilian hospitals, including 25 % of all trauma deaths. These numbers are expected to rise with the increased use of anticoagulants, especially those lacking an FDA-approved antidote. Cayuga Biotech is developing a commercially viable nanotherapeutic drug to stop bleeding. We deliver biomimetic polyphosphate (polyP) to wound sites to accelerate clotting, improving upon current treatments that initiate clotting. Attaching polyP to a nanoparticle significantly enhances shelf-life to allow for prehospital use. This strategy employs biocompatibility and selective targeting to improve safety and efficacy. The therapeutic is easily applied to bandages and sealants to treat injuries through topical application. We have completed the drug development stage and begun preclinical trials.

fluid synchrony

http://fluidsynchrony.com/

Fluid Synchrony develops wirelessly controlled drug infusion systems for safe, accurate, and localized administration of liquid drug formulations directly to targeted tissue. This automated metronomic dosing maximizes therapeutic efficacy while minimizing unintended side effects. Our patented microtechnologies enable a highly-desirable miniaturized form factor and superior power efficiency for implantable and wearable applications. Our high-performance micropump platform addresses multiple markets: laboratory animal research, veterinary care, agriculture animal, and human patient care. Fluid Synchrony has been awarded over $1.6 million in SBIR funding over the past year to develop multiple product lines. FluidSync™ microinfusion systems have been successfully demonstrated in long-term *in vivo* studies and have been sold to customers in academia and the pharmaceutical industry.

GI LOGIC

http://gi-logic.com/

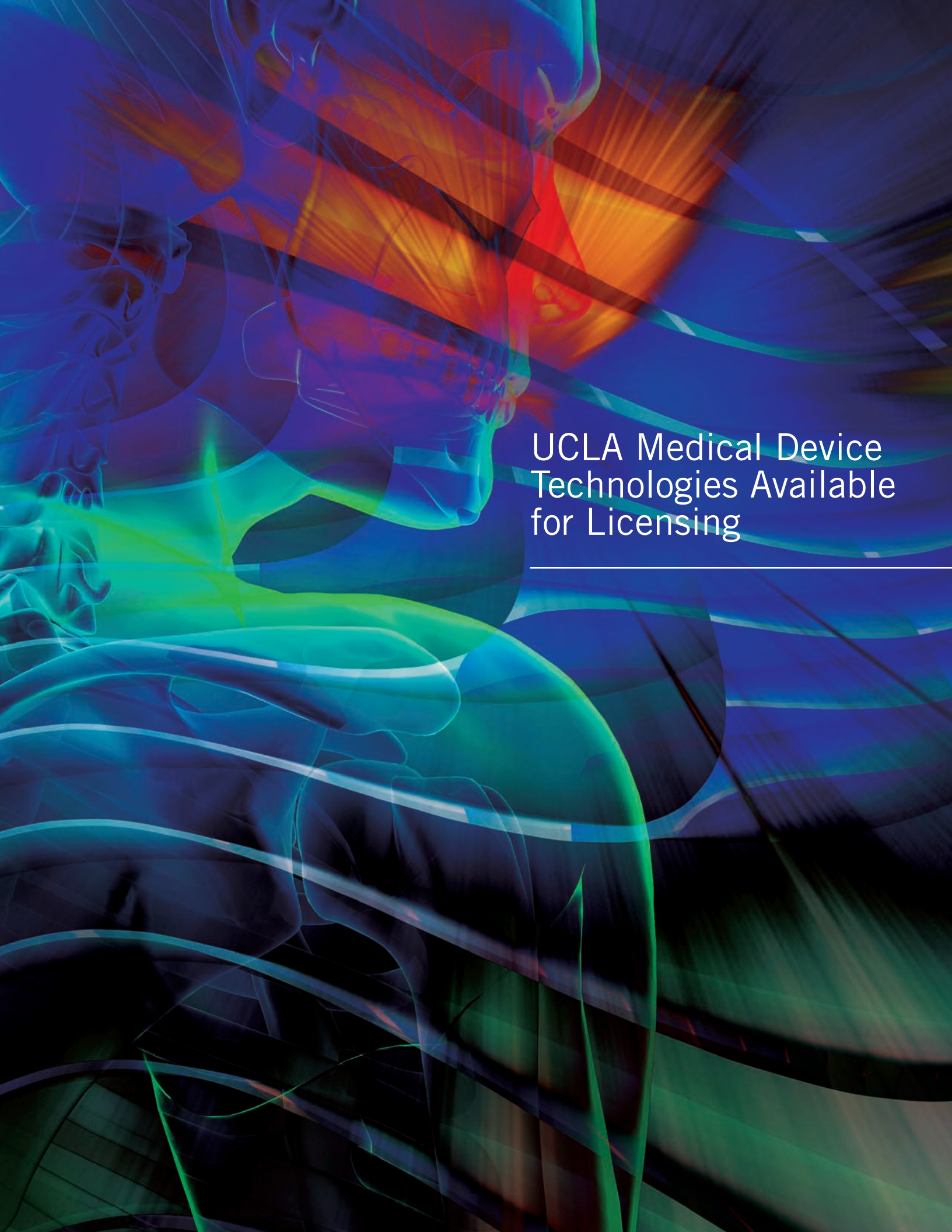
The mission of GI Logic is to continually innovate and evolve medical devices that help contribute to human welfare and advance the field of gastroenterology

GI Logic was created to address an urgent need for convenient, low cost, sensor systems that can be deployed rapidly in the hospital, clinic and home for diagnosis of digestive disorders. These sensor systems must provide network communication capability for both local area mobile computing devices as well as communication to remote assets.

Clinicians have traditionally relied on either the basic capabilities of a stethoscope or on invasive, often complex, methods to diagnose and treat increasingly common GI disorders. Through innovation and research, GI Logic aims to develop a range of new tools to help clinicians improve patient care and advance the field of GI medicine.

Implantable microelectronic devices are used to treat conditions like arrhythmias, Parkinson's disease, and back pain and other indications are under clinical investigation. This industry's market is expected to grow at greater than 15% for several years, however these devices continue to use 50-year old designs consisting of platinum electrodes embedded in silicone insulation, connected to titanium-encased electronics. The size and efficiency of these devices cannot be improved using the material technologies available today. Platinum Group Coatings (PGC) has developed a novel Electroplated Platinum Iridium Coated (EPIC) electrode technology for biomedical stimulation/sensing. EPIC allows electrode size reduction by >100x without decrease in performance. EPIC enables chronic stimulation using MEMS electrodes, currently not possible with thin-film fabricated microelectrodes. Our process is scalable, compatible with non-planar substrates and patent-protected. PGC is currently selling electrodes to research customers and engaging with medical device manufacturers for collaborative development programs.

QT Medical, Inc. is a spinoff of the Los Angeles Biomedical Research Institute (LA BioMed). Founded in 2013, QT Medical aims to lead the market for newborn screening of heart disease. Dr. Chang is Founder and CEO, Professor of Pediatrics at UCLA, who has 15 years research in newborn cardiac screening. The first product—QT-ECG, the world's smallest full function 12-lead ECG system designed for use in newborns, will launch in 2015. QTScreen—an ECG system designed for newborn screening of long QT syndrome, is currently in Phase II clinical trial. This will be the first 12-lead ECG system that can be used at home. 510(k) submission for QTScreen is anticipated in 2016, and service for long QT syndrome screening in newborns will launch soon after the FDA clearance. Cardioscreen—a wearable device with pulse oximetry, phonocardiogram and 12-lead ECG for babies, is currently under development. QT Medical has received over $2.2 million in funding from NIH. We are now seeking investors and strategic partners for product launch and clinical trials.



UCLA Medical Device Technologies Available for Licensing

Cardiovascular Devices

Coil-Assisted Retrograde Transvenous Obliteration (CARTO) Plug

Gastric varices (i.e. dilated submucosal blood vessels) are a common complication of portal hypertension in patients with cirrhosis and other liver diseases and are associated with serious morbidity (e.g. bleeding) and increased risk of mortality. An interventional technique called balloon-occluded retrograde transvenous obliteration (BRTO) has been shown to be effective in the management of gastric varices and is quickly gaining attention in the United States. However, due to long balloon indwelling time (4 - 48 hrs.), the balloon used in BRTO may become a nidus for complications. UCLA researchers have introduced a new technique called coil-assisted retrograde transvenous obliteration (CARTO). In this approach, metallic coils are utilized for occlusion of the shunt. They have also developed a new device that can automatically adjust its size and diameter to the blood vessel and prevent dislodging of the deployed coils. Design features also include a central conduit that enables the infusion of complementary coagulative materials such as GelFoam®.

UCLA Case No. 2013-082

LEAD INVENTOR: Edward Lee

Patent Status: Pending

Improved Treatment of Metabolic Acidosis

Professors Thomas Mason and Jeffrey Kraut in UCLA's Department of Chemistry and School of Medicine, respectively, have developed improved materials and methods of treating acute metabolic acidosis, a condition in which pH within a patient has become abnormally acidic and can be life-threatening. The inventors have developed more effective base-treatment solutions involving a strong base, such as disodium carbonate, mixed with a weak base, such as sodium bicarbonate to raise both intracellular and extracellular pH while beneficially consuming dissolved carbon dioxide. Additionally, the investigators have conceived new methods of delivering these formulations in a time- and spatially-varying manner, thereby optimizing the solution's mixing ratio and rate of delivery based on past and present measurements of a patient's blood-gas parameters, including pH.

UCLA Case No. 2013-076

LEAD INVENTOR: Thomas Mason

Patent Status: Pending

Novel Application of Laser Lithotripsy for Treating Vascular Calcification

Traditionally, vascular bypass surgery has been considered the "gold standard" of treatment for peripheral arterial disease. However, surgery is associated with significant morbidity and mortality, and 40% of these patients are not eligible for surgery. Percutaneous Transluminal Angioplasty (PTA) has been introduced as an alternative to surgical revascularization demonstrating favorable clinical outcomes, but still carries its own limitations. To overcome limitations of PTA, UCLA researchers have developed a special endovascular catheter that can be used for laser-assisted angioplasty under direct visualization. This method also allows for irrigation and extraction of ablation-induced debris, thus reducing the risk of distal embolization. This method is based on Holmium laser and provides a higher energy and repetition rate for smoother cutting and faster, more efficient tissue ablation.

UCLA Case No. 2012-565

LEAD INVENTOR: Bashir Tafti

Patent Status: Pending - Pub. No. WO/2013/184697

Novel Catheter for Precise Stent Delivery

Current therapeutic strategies for the management of cerebrovascular disease (CVD) include endovascular stents to expand a narrowed or blocked artery. The flexible nature of the stent that permits expansion and enables passage through tortuous blood vessels also imposes a technical challenge, known as foreshortening, to the accurate placement of the stent. Foreshortening describes the change in length of the stent as it elongates to fit the confines of the delivery catheter and shortens following its expansion within the target vessel - leaving the surgeon to estimate precise placement. UCLA clinician Dr. Satoshi Tateshima in the Division of Interventional Neuroradiology has developed a novel catheter to help anticipate the degree of foreshortening during stent deployment. The present technology overcomes the inherent limitations of the widely used braided and laser cut stents – providing a superior device with increased placement accuracy and ease of use.

UCLA Case No. 2012-218

LEAD INVENTOR: Satoshi Tateshima

Patent Status: Pending - Pub. No. WO/2014/042900

Self-Navigating Intracardiac/ Intravascular Catheter

While fluoroscopy is frequently used to localize catheters within the body, its performance is limited by the radiation exposure, space, and noise and blurring effects of the X-ray and acquisition system. Thus, catheter-based procedures —particularly those that require high precision, such as accessing the coronary sinus—are limited by fluoroscopy and technical operator skills as are other imaging modalities. To address the challenges of catheter placement, Dr. Peyman Benharash of UCLA's Division of Cardiothoracic Surgery and colleagues have designed a self-navigating catheter that contains sensors to determine its own position in the body. To date, the catheter design has been tailored to accessing the coronary sinus, a common site for interventional therapies. Sensors and other self-contained imaging modalities will provide inputs to either an operator or an automated system that will drive the catheter to the appropriate location.

UCLA Case No. 2012-108

LEAD INVENTOR: Peyman Benharash

Patent Status: Pending

Unobstructing Microdevices for Self-Clearing Implantable Catheters

Implanted medical catheters are now an integral part of clinical care. However, many chronically-implanted catheter systems are plagued with reduced performance as a result of accumulating biological debris. Dr. Jack Judy and colleagues in the Department of Bioengineering at UCLA have developed an unobstructing microdevice for self-clearing catheters that alleviates flow obstruction. The researchers designed micro-mechanical mechanisms to disrupt the accumulation of biological material and keep catheter pores clear of debris. This device may be directly integrated into commercially available catheter systems for use in existing surgical techniques (e.g. chronically implanted catheters).

UCLA Case No. 2010-175

LEAD INVENTOR: Jack Judy

Patent Status: Pending - Pub. No. US 2011/0313340 A1

Dual Rotational Stent

Researchers at UCLA invented a novel dual rotational stent device for the endovascular treatment of cerebral aneurysm without the need for placing coils in the aneurysm lumen. The adjustable and variable struts density pattern of the new stent device allows it to cover the orifice of the aneurysm. This is advantageous for causing blockage of blood flow to the occluding aneurysm while sparing blood flow to perforators or side branches near the aneurysm neck. Specifically, the new compound stent has two main, but separate components; one for being positioned and stabilized in the parent vessel spanning the neck of aneurysm, and another for controlling the degree of blood flow into the aneurysm.

UCLA Case No. 2009-668

LEAD INVENTOR: Dieter Enzmann

Patent Status: Pending - Pub. No. W0/2014/028913

Bioactive Endovascular Coils

Researchers at UCLA have developed a detachable endovascular coil system with increased biological activity. These coil materials are inherently bioactive and can be further coated with, or act as a delivery vehicle for, bioactive or therapeutic agents, such as drugs to control the inflammatory reaction inside an aneurysm. The innovation maintains the mechanical flexibility of the coils, ensuring that they are highly effective at preventing blood flow. These improvements will accelerate aneurysmal healing and minimize their rate of recurrence.

UCLA Case No. 2011-135

LEAD INVENTOR: Benjamin Wu

Patent Status: Pending - Pub. No. US 2014/0180395 A1

Brain Collateral Perfusion Augmentation by Cerebral Venous Pressure Modulation

UCLA researchers have developed a novel method and device to improve cerebral blood flow to about 50% of normal baseline value, thereby treating acute or chronic ischemia associated with stroke. The device and corresponding method uses applied pressure to artificially achieve collateral circulation in the brain. To increase cerebral venous pressure and thereby, redirect maldistributed blood flow, the device creates an occlusion of one or more veins coupled to the collapsed vessel. The device consists of an elongated tubular member with proximal and distal ends for insertion into a patient's superior vena cava (or other vein), an expandable occluder located at the distal end of the tubular member (the occluder has an expanded and a collapsed state), a device to measure pressure at the distal end of the tubular member, a device to measure cerebral blood flow in the patient, and a controller programmed to actuate the expandable occluder as a function of the measured venous pressure and the measured cerebral blood flow.

UCLA Case No. 2009-224

LEAD INVENTOR: David Liebeskind

Patent Status: Pending - Pub. No. US 2010/0318114 A1

Method and Device for Treating Intracranial Vascular Aneurysms

Inventors at UCLA have developed a device, and a method, for the therapeutic management of intracranial vascular aneurysms. This technology involves the use of intravascular catheters that can directly image the aneurysm, and can occlude the entire lumen of the aneurysm sac using liquid sealing agents. The intracranial catheters are designed in various configurations so that they can be used to treat aneurysms regardless of their neck size or location within the intracranial vascular system.

UCLA Case No. 1996-528

LEAD INVENTOR: Tarik Massoud

Patent Status: U.S. Patent Issued - # 5,776,097

Neuro-Endovascular Ultrasound Thrombolysis

Researchers at UCLA have developed a new method of treating stroke using ultrasonic energy. There are several advantages of this method over conventional fibrinolytic therapy: (1) ultrasound can recanalize arteries much quicker than fibrinolytic therapy, (2) ultrasound does not cause bleeding complications, and (3) ultrasound can be more economical than fibrinolytic therapy in itself and in overall hospital costs.

UCLA Case No. 1995-593

LEAD INVENTOR: Cheng Ji

Patent Status: U.S. Patent Issued - # 6,024,718

CNS Technologies

Wireless Implantable System to Restore Memory

Traumatic brain injury (TBI) may cause both anterograde and retrograde memory impairment. While implantable deep brain stimulation (DBS) systems are FDA-approved for the treatment of Parkinson's disease and epilepsy, there are currently no interventional therapies for memory restoration in TBI patients. UCLA researchers have developed a wireless, implantable DBS system that delivers electrical brain stimulation via specially designed electrodes (UCLA Case No. 2014-287) in order to restore and enhance the memory of patients suffering from TBI.

UCLA Case No. 2014-959
LEAD INVENTOR: Itzhak Fried
Patent Status: Pending

A Method for the Unsupervised Detection of Biomarkers of Epileptogenic Brain in Real Time

Dr. Weiss from the Department of Neurology has developed a method for the real-time detection and quantification of inter-ictal discharges and high-frequency brain oscillations (HFOs) associated with epileptic seizures and neurological or psychiatric disorders. The system or device may process previously acquired EEG or MEG with a short turn-around time, or receive input from a data acquisition device and operate in a fully automated, real-time fashion. By distinguishing between pathological discharges and normal physiological brain activity, this device can automatically detect brain tumors and developmental abnormalities that generate seizures.

UCLA Case No. 2014-699
Lead Inventor: Shennan Weiss
Patent Status: Pending

Implantable Targeted Ultrasound for Neuromodulation

Electrical deep brain stimulation is the current standard of care for many neurological diseases, but the imprecise targeting of specific neural circuits by currently available trans-cranial stimulation devices limits its effectiveness. UCLA researchers have developed a prototype of an implantable ultrasound device for stimulation and modulation of neural circuits in the brain. This technology is the first millimeter-scale, low frequency implantable ultrasound probe suitable for targeted invasive ultrasonic stimulation. This device would offer a novel form of neuromodulation, with distinct advantages over both electrical deep brain stimulation and trans-cranial focused ultrasound technologies.

UCLA Case No. 2014-512
LEAD INVENTOR: Amit Mulgaonkar
Patent Status: Pending

Wireless Wearable Big Data Brain Machine Interface

In order to improve the investigation, diagnosis, and treatment of brain activity, UCLA researchers have designed a user-friendly brain-machine interface (BMI) that consists of an implanted recording-and-transmitting module, a wearable receiving-and-forwarding module, and a mobile post-processing unit. Where previous systems designed to monitor neural activity are limited in data transfer rates and use physically connected wires, this newly designed BMI can wirelessly transmit data at an unprecedented rate of ~1 Giga-bit/second. This BMI could support research investigating brain activity mapping, the diagnosis of brain abnormalities, and the development of new treatments to prevent or cure brain-related illnesses.

UCLA Case No. 2014-495
LEAD INVENTOR: Wentai Liu
Patent Status: Pending

Silicon Microsystems for High-Throughput Analysis of Neural Circuit Activity

Functional MRI (fMRI) and electroencephalography (EEG) techniques can provide coarse-grained pictures of neuronal activity in the brain; however, they are unable to provide information on rapidly changing activity of single neurons, which is key to unraveling how the brain codes information. UCLA researchers in the Department of Neurobiology have developed a unique electrode array capable of simultaneously mapping neural activity from two or more brain structures. This technology addresses major technical obstacles of recording single neuron activity and expands on the potential of neuronal monitoring by allowing single-cell-resolution measurements of activity from numerous networked brain structures. In addition to enhanced recording performance, these new electrode array-probes will be more cost-effective to manufacture, as well as smaller and hence less invasive.

UCLA Case No. 2013-039
LEAD INVENTOR: Sotiris Masmanidis
Patent Status: Pending

Quantitative EEG Method to Identify Individuals at Risk for Adverse Antidepressant Effects

Antidepressant medication has demonstrated efficacy for the symptoms of depression, but some individuals may experience adverse effects on mood during antidepressant treatment that could result in harm to themselves or others. Researchers at UCLA have developed a method that identifies patients likely to experience adverse effects from antidepressant medication. A patient's response to the treatment is measured by using quantitative electroencephalographic recordings (QEEG). This method has been validated in a small double-blind placebo-controlled clinical trial with 97% accuracy. Patient response to medication was corroborated by using standard clinical checklists that diagnose adverse symptoms.

UCLA Case No. 2006-262
LEAD INVENTOR: Aimee Hunter
Patent Status: U.S. Patent Issued - # 8,521,270

Device Materials

Biodurable and Bioselective Coatings for Dental Implants

The oral cavity is a complex ecosystem of microbial organisms, some being harmful and some beneficial. However, modern medicine has introduced materials and implants that may disrupt the natural equilibrium and lead to oral health problems. UCLA researchers are developing a series of materials that prevent the attachment and growth of harmful bacteria, but allow selected neutral or beneficial flora to grow at endogenous levels; much like the normal environment of healthy oral cavities. The benefits of this new paradigm for oral healthcare are realized by new materials that support bio-beneficial and selective environments for preventative care, rather than treating diseases after the fact.

UCLA Case No. 2015-463
LEAD INVENTOR: Wenyuan Shi
Patent Status: Pending

Robust, Ultra-Flexible, Micro-Encoded Ferromagnetic Tape for Bioseparation and Assembly

Magnetic particles have found enormous use in biomedical applications, including drug delivery, cell separation, and as an MRI contrast agent. Dr. Dino Di Carlo and colleagues have developed a ferromagnetic tape, with user-defined microscale thickness, size, and structure, on a flexible substrate with a user-defined elastic modulus. This technology can be attached alongside microfluidic channels, Eppendorf tubes, catheters, and more to enable patternable and tunable separations of magnetic particles and significantly increase the speed and control over particle positioning.

UCLA Case No. 2015-154
LEAD INVENTOR: Dino Di Carlo
Patent Status: Pending

Hydrogel Coatings on Medical Implants for Preventative and Therapeutic Applications

In the case of open fractures, up to 50% of the patients suffer from osteomyelitis, a bone infection caused by the introduction of bacteria and other germs into the wound site. Researchers in the UCLA Department of Chemical and Biomolecular Engineering have incorporated antibiotics into a novel amphiphilic polymer that was covalently linked to titanium implants. The coating allows for the local release of antibiotics near the implant and has demonstrated efficacy against S. aureus infections in vivo. By taking advantage of the polymer's self-assembly nature, researchers were able to create a versatile structure with control over the thickness of the hydrogel layers, the loading capacity of antibiotics and the polymer's drug elution properties.

UCLA Case No. 2014-838
LEAD INVENTOR: Tatiana Segura
Patent Status: Pending

Poly(p-xylylene) Polymer-Based Microfilms for Oral Delivery of Therapeutics

Poly (p-xylylene), trade name Parylene, is an FDA-approved material used as a protective coating for medical devices, but its elution capabilities in pharmaceuticals are less exploited. UCLA researchers have utilized semi-porous poly (p-xylylene) film as a stand-alone vehicle for the intraoral delivery of pharmaceuticals with predetermined time scales and dimensions. The film is synthesized as a semi-porous patch to be placed in the mouth for long-term (greater than 1 month) storage and delivery of therapeutic compounds. Due to the benign synthesis process of the Parylene film, a variety of therapeutic compounds can be incorporated, including small molecule drugs and proteins for anti-inflammatory, anti-cancer and anti-mucosal ulcer therapies.

UCLA Case No. 2014-555
LEAD INVENTOR: Dean Ho
Patent Status: Pending

Graphene Based Catalysts for Biomimetic Generation of Antithrombotic Species

Thrombogenicity (the tendency for blood to adhere to a material's surface) has remained a major challenge for implanted medical devices since their inception. UCLA researchers from the Departments of Chemistry and Materials Science and Engineering have developed a graphene-based catalyst for generating HNO, an antithrombogenic species, for biomedical applications. This material greatly extends the lifetime of antithrombogenicity by using endogenous and abundant glucose and L-arginine for the production of HNO. The graphene-based conjugates can be incorporated into polymer coatings that can be applied to biomedical devices.

UCLA Case No. 2014-521
LEAD INVENTOR: Xianfeng Duan
Patent Status: Pending

A Novel Polymer Platform for Drug Delivery

Aggressive surgical resection and chemo-radiation therapy (CRT) are the dominant treatment course for patients with Head and Neck Squamous Cell Carcinoma (HNSCC), but these approaches often negatively impact patient quality of life, including disfiguration and loss of facial mobility in some cases. UCLA researchers have developed a novel implantable drug delivery device that reproducibly reduces tumor growth in vivo, bypassing the traditional HNSCC treatment course. The technology combines biocompatible polymer sheets with anti-tumor drugs and immune-boosting proteins that can be implanted to the surgical bed after debulking of the tumor. These layers of sheets are highly customizable, as they can incorporate multiple drugs at different concentrations and release rates.

UCLA Case No. 2014-235
LEAD INVENTOR: Benjamin Wu
Patent Status: Pending

Bidirectional Hyperelastic Covers for Woven Stents

Current stent designs frequently result in hazardous wrinkling of the cover upon deployment, substantially increasing the risk of stent failure, and subsequent morbidity. UCLA researchers have developed a novel hyperelastic thin film nitinol (HE-TFN) that can be used to cover medical stents. This porous film maintains a deformation ratio that matches the commercial stent distortion during deployment. As a result, potentially dangerous kinks and folds that arise from the crimping/expanding process are substantially avoided. This ensures the conformal stent delivery and deployment. Furthermore, the design strategy and the hyperelastic material allow customization of the cover to different deformation ratios, making the novel cover widely applicable to various types of commercial stents.

UCLA Case No. 2013-238

LEAD INVENTOR: Greg Carman

Patent Status: Pending

Surface Modification of Endovascular Devices

Current endovascular procedures for the treatment of vascular diseases use a number of metallic devices including guidewires, stents and coils. Although these materials are commonly used, they have several limitations, such as friction generated during the installation procedure and the need to be on blood thinning medication for a long time after implantation. Researchers at UCLA have discovered a method of treating NiTi, "nitinol," sheets, wires, or stents that overcomes these limitations. The devices are treated with a type of light, causing them to take on super hydrophilic properties. This conversion increases the affinity between the device and vascular tissue, resulting in the acceleration of the healing process and a reduction in clotting. The hydrophilic device also demonstrates less friction during insertion and delivery.

UCLA Case No. 2008-007

LEAD INVENTOR: Satoshi Tateshima

Patent Status: U.S. Patent Issued - # 8,487,284

Improvement of Dental Resins: Decreased Toxicity and Improved Biocompatibility

Resin-based and resin-containing materials are routinely used in dental practice as direct filling materials, fissure sealing agents, and as bonding resins or resin cements for metal, porcelain, resin inlays, veneers, crowns, and bridges. While the use of resin-containing materials is beneficial to the appearance of patients, these materials carry the risks of cytotoxicity and allergy often through resins such as HEMA or TEGDMA. UCLA investigators have discovered that the presence of a chemical inhibitor (CI) can inhibit HEMA- and TEGDMA-mediated apoptosis (cell death) in numerous human cell lines. Not only was cell death inhibited, but the presence of the CI also led to an increased viability and function of treated cells. The results indicate that the CI prevents adverse effects mediated by HEMA, TEGDMA and bleaching agents and may be incorporated into additive resin materials.

UCLA Case No. 2005-379

LEAD INVENTOR: Anahid Jewett

Patent Status: U.S. Patent Issued - # 8,481,005

Diagnostic Tools

ClearBot

To further our understanding of the human body, it is essential to continuously develop new tools to visualize the 3D structure and molecular details of complex organs and tissues, such as those of the brain and tumors. Current visualization techniques include "clearing" the tissue sample by infusing reagents into the tissue. However, some methods involve lengthy experimental times or setups that may cause damage to the tissue samples. UCLA researchers in the Department of Bioengineering have developed a device and an accompanying method of clearing multiple bulk tissue samples simultaneously that has been proven to produce optically transparent tissue samples from whole mouse organs. Compared to conventional methods, the device also reduces the time, damage to tissue samples, and quantity of reagents that are necessary.

UCLA Case No. 2014-731

LEAD INVENTOR: Dino Di Carlo

Patent Status: Pending

Arrayed Force Phenotyping of Single-Cells for High-Throughput Screening and Analysis

Cell contractility is important to several physiological processes, such as cardiac function and immune cell function, and its dysregulation is implicated in a variety of diseases. Current technologies used to assess cell contractility forces, however, have limitations in objectivity of measurements, throughput, and normalization of test conditions. UCLA researchers from the department of bioengineering have developed a simple and high-throughput tool for making well-defined quantitative measurements of cell contractility that is compatible with standard SBS well plate formats. During the measurements, the platform also maintains strict control over environmental conditions, cell orientation, spacing, and spreading.

UCLA Case No. 2014-709

LEAD INVENTOR: Dino Di Carlo

Patent Status: Pending

Single-Molecular Homogenous Amplified Detection in Confined Volumes

Enzyme-linked immunosorbent assays (ELISA) are widely used tools for analytical research in molecular biology research labs, and in clinical diagnostics. Researchers at UCLA have devised a method to detect analytes using a modified sandwich ELISA that does not require immobilization on a surface or a solid phase. Using fractioned volumes, detection signals can be measured as a binary cutoff signal, leading to higher sensitivity. Additionally, this assay does not require a number of wash steps or sequential addition of reagents. It only requires one mix step and subsequent compartmentalization. This method can be used as a clinical diagnostic tool, including point of care devices, and for analytical research.

UCLA Case No. 2014-180
LEAD INVENTOR: Dino Di Carlo
Patent Status: Pending

Universal Bio Diagnostic, Drug Delivery Device & Marker For Correlated Optical & Electron Microscopy

UCLA researchers from the Department of Chemistry have developed nanodiamonds with highly stable fluorescent centers that are visible in both fluorescent imaging and electron microscopy. This technology is non-toxic and non-blinking, and the surface can be facilely conjugated with biomacromolecules for targeting purposes. This technology enables the visualization of subcellular targeting of drugs and other biomacromolecules, and the measurement and localization of subcellular heating.

UCLA Case No. 2014-166
LEAD INVENTOR: Louis Bouchard
Patent Status: Pending

Multi-Modal Depth-Resolved Tissue Status Monitor

Researchers at UCLA have developed a portable tissue status monitor that sits on the surface of the skin and can provide depth-resolved information about tissue health status, which is of paramount importance where tissue is very thin or consists of multiple layers. The monitor uses a variety of sensors to perform not only near-infrared spectroscopy, but also ultrasound, pressure, temperature and stretch sensing. In providing depth-resolved physiologic information, the technology may be used to monitor tissue after vascular surgery, during prolonged surgeries, or after mastectomy. In addition, the device can fit easily under surgical dressings or casts, and operates wirelessly, making it rather simple to use.

UCLA Case No. 2013-527
LEAD INVENTOR: Warren Grundfest
Patent Status: Pending

Point-of-Care Detection of Nucleic Acids

DNA testing for infectious diseases at the point of care is beginning to enter clinical practice in both developed and developing countries. Dr. Bashir Tafti of UCLA's Department of Interventional Radiology has developed a method for rapid point-of-care detection of nucleic acids. The approach couples nucleic acid amplification with an enzyme-based chemical reaction that supports subsequent quantification with existing, portable devices. The detection scheme precludes the use of fluorescence or chemi- or bio-luminescence, thereby improving the stability and accuracy of detection. The researchers have also adapted the methodology for detecting protein antigens without the need for luminescent or fluorescent tags.

UCLA Case No. 2012-731
LEAD INVENTOR: Bashir Tafti
Patent Status: Pending

A Rectal Mucosa Sampling Tool

Obtaining a sample of the rectal mucosa is key to millions of diagnostic procedures performed each year, including those for colorectal and cervical cancer. Physician-scientists at the UCLA David Geffen School of Medicine have developed an improved device for sampling the rectal mucosa. The device design eliminates the need to completely insert the tube into the rectum. This substantially reduces the discomfort associated with the procedure. In addition, other novel design implements make the tool more efficient, more precise, and safer for the patient.

UCLA Case No. 2012-535
LEAD INVENTOR: Jonathan Braun
Patent Status: Pending

A Device for In Vivo Characterization of Body Fluids

The rheological properties of certain fluid reservoirs in the body, such as the vitreous humor of the eye, hold clinical value for monitoring a variety of disorders as well as evaluating effects of therapeutic treatments. However, no devices currently exist to rapidly assess fluid properties in humans in vivo. Dr. Pirouz Kavehpour, Professor in the Department of Mechanical & Aerospace Engineering at UCLA, and colleagues have developed a needle-like probe to directly quantify the rheological properties of human body fluid in real time. Dr. Kavehpour's work has demonstrated that the physical properties of human body fluid can be informative in determining macromolecular structure and organization within an organ and that this information may be useful for detecting and monitoring disease. This probe has the advantages of being minimally-invasive and can measure fluid properties in vivo, obviating the need for fluid extraction. Thus, this device can be used to diagnose the risk or the presence of a degenerative or pathologic state through measurement of body fluid.

UCLA Case No. 2011-208
LEAD INVENTOR: Pirouz Kavehpour
Patent Status: Pending

Microfluidic and Solid-State Beta Camera In Vitro Radioassay

There is a broad interest in targeting kinases for drug discovery and patient diagnosis. UCLA researchers have developed a polydimethylsiloxane microfluidic platform with a solid state beta camera to measure kinase activity on a limited amount of patient samples. Miniaturizing the radiometric kinase assay brings several advantages over current radiometric assays. The amount of cell input required is reduced by 1,000 times over conventional assays. This allows for direct experimentation on clinical samples that are expensive or perishable. Also, the amount of radioactivity is reduced by at least one order of magnitude, alleviating radiation safety concerns. Further, the chips are inexpensive to custom design and produce. Finally, since most of the steps in the assay are under digital control, the performances of these assays are more efficient, faster, and less labor-intensive.

UCLA Case No. 2011-129

LEAD INVENTOR: Thomas Graeber

Patent Status: Pending - Pub. No. US 2013/0244257

Microfluidic Platform to Control Particle Placement and Spacing in Channel Flow

Researchers from the Department of Bioengineering at UCLA have developed a microfluidic platform that controls particle-wall and particle-particle interactions by intertial flow. This permits fine manipulation of inter-particle spacing during solution exchange. This microfluidic platform utilizes expansion and contraction channel geometries to make particle distribution more uniform in Reynolds number flow. Moreover, particle-particle spacing can be tuned to a desired frequency. Unlike existing particle manipulation methods, particle manipulation by inertial flow gives extremely high-throughput without bulky external control units. The device fabrication is simple and easy, requiring PDMS molding and bonding only. With further development, it could be used as a platform for a generation of high-throughput flow cytometers.

UCLA Case No. 2011-038

LEAD INVENTOR: Dino Di Carlo

Patent Status: Pending - Pub. No. US 2013/0233420

Sheathless Inertial Cell Ordering Microfluidic Device for Extreme Throughput Flow Cytometry

Flow cytometry is regularly used for patient blood analysis. However, because flow cytometry analyzes cells in a serial process, it is time-consuming and lacks sufficient throughput (current methods top out at 10,000 cells/sec) to detect rare cells in blood which can have concentrations in the range of one in one quadrillion ($1{:}10^{15}$). UCLA researchers have developed a microfluidic chip capable of processing ~28 million cells per second. The design does not require a sheath stream, which simplifies the design without sacrificing efficiency. By coupling the chip with high-speed imaging, the researchers can observe single cells to compare physical characteristics of specifically targeted/stained cells for accurate blood cell detection and analysis.

UCLA Case No. 2010-277

LEAD INVENTOR: Dino Di Carlo

Patent Status: U.S. Patent Issued - # 8,693,762

Accurate and Rapid Micromixer for Integrated Microfluidic Devices

UCLA researchers have designed and created a novel mixer for microfluidic devices that combines the advantage of rapid mixing times of droplet-based mixers (typically found in continuous flow devices) with precision and accuracy for controlling mixing volumes and ratios. The chip consists of three components: a digital droplet generator, a droplet mixer, and a gas extractor. It has been designed to easily integrate into digital microfluidic chips, (i.e. chips that use valves to control fluid flow), as well as automated systems for a variety of applications. The researchers have also built an interface between the mixing chip and a semi-automated chemical synthesis unit to synthesize a radioactive labeling probe and immediately label a biological molecule of interest.

UCLA Case No. 2008-249

LEAD INVENTOR: Michael van Dam

Patent Status: Pending – Pub. No. US 2011/0103176

Non-Invasive Optometric Medical Diagnostic Device

UCLA researchers have created a fast, low-cost, and non-invasive approach for diagnosing various skin-related diseases. The technology takes advantage of the temporal response of endogenous fluorophores to a pulse of excitation light. A non-invasive optometric device is used to measure skin autofluorescence which depends on the health of the skin's patient. The optometric device can be used to diagnose any disease affecting the auto-fluorescence of the skin. Examples include hyper-pigmentation diagnosis of non-melanoma skin cancer, photo-aging caused by UV, and monitoring utriculus. It can also be used to determine the depth and size of a cancerous lesion and changes in skin morphology. The device could be used for—but is not limited to—monitoring diabetes, skin-related disorders, cancer, acne, and photo-aging.

UCLA Case No. 2004-657

LEAD INVENTOR: Laurent Pilon

Patent Status: U.S. Patent Issued - # 7,904,140

Orthopedic Devices

Objective, Real-Time Acoustic Measurement and Feedback for Proper Fit and Fill of Hip Implants

Orthopaedic surgeons currently rely on manual assessment of the fit of implants in bone, leaving the procedure prone to technical errors that require revision surgeries. The present invention helps improve implant fit by aiding surgeons' senses during the broaching procedure by analyzing and classifying acoustic features generated from hammering the broach into cancellous bone. The method monitors the impact between the femoral component of a hip prosthesis with the patient's femur. The impact data is decomposed by a data acquisition and analysis device. Metrics based on a number of acoustic features are calculated to determine the fit and stability of the broach in the femur. Results are classified and output to a user interface to assist the surgeon.

UCLA Case No. 2014-935

LEAD INVENTOR: George Hafzalla

Patent Status: Pending

A Novel Device for Quantifying Rotational Stability of the Knee

The current standard for determining anterior cruciate ligament (ACL) reconstruction effectiveness, the Lachman test, only measures translational stability. For rotational stability, the pivot shift test is widely accepted, though it lacks an objective means of quantification and current devices are large, fixed-position constructs that are impractical for clinical use. Dr. Petrigliano and colleagues in UCLA's Department of Orthopaedic Surgery have developed a novel microelectromechanical system (MEMS) gyroscope with specific software architecture to quantitatively assess both rotational and linear stability of the knee. Non-invasively applied to a patient's lower extremity, it provides an objective measurement of the axial rotation of the tibia relative to the femur during the pivot shift exam.

UCLA Case No. 2012-519

LEAD INVENTOR: Frank Petrigliano

Patent Status: Pending - Pub No. WO/2013/123263

An Improved Cast for Bone Fracture Healing

The healing of a bone fracture often requires extended immobilization of the affected area. However, traditional plaster casts are heavy, uncomfortable, and commonly cause skin irradiation and pressure point pain. Casts are also subject to molding, degradation, and infection caused by water and sweat. Researchers from UCLA's Office of Intellectual Property and from the Department of Bioengineering have developed an improved layered cast using lighter, synthetic materials that allow greater water permeability than existing casts. The new cast also allows for reversible hardening of the cast to allow for adjustments and removal of pressure points over the course of application. This new cast advances bone fracture treatment by improving the hygiene associated with cast-wearing and by increasing patient comfort through its adjustability and enhanced mobility.

UCLA Case No. 2012-755

LEAD INVENTOR: Benjamin Wu

Patent Status: Pending

Radiation Therapy & Oncology

A Breast Immobilization Device to Improve Radiation Therapy Dosimetry

Breast setup and immobilization is a difficult problem for external beam radiation therapy of breast cancers. A lack of setup reproducibility with breast tissue results in sub-optimal dosimetry and tissue toxicity in non-targeted, healthy tissues. Dr. Ke Sheng, Associate Professor in UCLA's Department of Radiation Oncology, has developed a novel breast immobilization device that allows for more comfortable support as well as a robust radiation dosimetry improvement in breast tissue without the skin dose build-up effect that has plagued existing methods. The device is low-cost and modifiable for the desired breast morphology.

UCLA Case No. 2013-077

LEAD INVENTOR: Ke Sheng

Patent Status: Pending - Pub. No. WO/2014/074602

Magnetic Resonance Imaging (MRI) Device for Improved High-Dose-Rate (HDR) Brachytherapy Treatment Planning

Internal radiation therapy (brachytherapy) involves the positioning of tiny, radiation-emitting sources within tumor tissue by using delivery devices such as catheters, needles or other hollow conduits. Dr. Daniel Ennis, Dr. Jeffrey Demanes, and colleagues in UCLA's Department of Radiological Sciences have developed a device that allows for the effective imaging of the radiation-delivering catheter and the surrounding tissue. Under MRI, the device can be detected with high contrast, thereby providing valuable positioning information of the treatment catheters relative to the tumor and normal tissue. The device will allow optimal positioning of the radiation source for the purpose of radiation therapy. This device has utility in visualizing catheter placement in the body where brachytherapy is the preferred treatment strategy and where catheters are used as brachytherapy conduits.

UCLA Case No. 2012-546

LEAD INVENTOR: Daniel Ennis

Patent Status: Pending

Sensors & Patient Monitoring Devices

Autonomous Thermoelectric Energy-Harvesting Platform for Biomedical Sensors

To make thermoelectric energy harvesters (TEH) a truly autonomous energy source for size-constrained, wireless biomedical sensors and eliminate the need for batteries, it has been necessary to drastically improve their energy density and conversion efficiency. UCLA researchers from the Department of Electrical Engineering have developed an autonomous energy source for implantable biosensors by developing a TEH that can operate with a 68% end-to-end peak efficiency with <20ms tracking time, and start-up voltages as low as 65mV. A 645μW regulated output power was harvested from the head of a rat implanted with the new TEH while achieving a 7.9x improvement in regulated power density.

UCLA Case No. 2015-245
LEAD INVENTOR: Dejan Markovic
Patent Status: Pending

Non-Invasive System for Classification of Individual's Intake

UCLA researchers have developed a method for processing data from piezoelectric sensors worn around the neck in order to more accurately assess what foods an individual has ingested. Algorithms are being refined that employ a spectrogram analysis towards multiple piezoelectric sensor data. This method could greatly improve monitoring of food intake in an effort to better meet weight management goals.

UCLA Case No. 2015-108
LEAD INVENTOR: Majid Sarrafzadeh
Patent Status: Pending

A Novel Method and Apparatus to Monitor Cardiac Disease

Most heart conditions are characterized by detectable abnormalities of electrical (neural) heart function, but there currently exists very limited technology for the prolonged active monitoring and early stage treatment of these abnormalities. UCLA researchers have developed a system that records and analyzes electrical signals from heart neurons. This technology enables the detection of functional abnormalities associated with heart disease, and can improve diagnosis, continuous monitoring, and treatment.

UCLA Case No. 2015-093
LEAD INVENTOR: Kalyanam Shivkumar
Patent Status: Pending

ECG-gated Pulsed Wave Doppler Ultrasound Device for Zebrafish

A real-time non-invasive methodology to monitor the structure and function of cardiac organs in small animals is needed in research and technology development. UCLA researchers have developed a high frequency ultrasound transducer that can simultaneously acquire an electrocardiogram and an echocardiogram to monitor the physiological conditions of small animals in real-time and in a non-invasive manner. The device and methodology can be used in monitoring the health of cardiac tissue during post cardiac transplantation and drug screening.

UCLA Case No. 2015-087
LEAD INVENTOR: Tzung Hsiai
Patent Status: Pending

Wireless Remote Sensing of Changes in Fluid Filled Containers

Trials of remote sensing of patient metrics, such as blood pressure, have been successful in reducing hospital visits and medical costs by increasing the accuracy and amount of data, while lowering the amount of staff time necessary to take the data. However, for accurate fluid management, staff must measure and analyze the fluids, their flow rates, and their compositions in order to ensure quality care. UCLA researchers have developed a novel device and method for continuous and dynamic monitoring of patient fluids. This technology may extend beyond patient fluids to other medium such as evaluation of air (air leaks) following lung surgery or injury that guide timely management of drainage tubes. Wireless remote sensing technology may quickly detect changes in fluid or air measurements suggestive of complications before or after surgery enabling earlier discharge from the hospital and safer outpatient monitoring.

UCLA Case No. 2014-499
LEAD INVENTOR: Dieter Enzmann
Patent Status: Pending

Prediction of Clinical Deterioration

Dr. Scott Hu at UCLA has developed a method to predict clinical deterioration of patients, which could warn clinicians of impending clinical deterioration before its occurrence. This predictive method is able to detect rare events of patient deterioration with high sensitivity and improve results as more samples are entered. This method had a positive predictive value that was 50% greater than traditional statistical models. It is currently being used to predict sepsis in leukemia patients, but is being adopted to predict respiratory failure, myocardial infarction and other common critical care aliments.

UCLA Case No. 2014-445
LEAD INVENTOR: Scott Hu
Patent Status: Pending

Saturation-Tolerant Electrophysiological Recording Interface

Weak electrophysiological input signals (EEG, ECG, EMG) are often detected by digitizing them using a large voltage gain in order to achieve a low background noise level. However, in noisy environments, the loud signals from motion artifacts, unrelated biological signals, or man-made interferers saturate the input signal and prevent their detection. Researchers at UCLA have designed an electrophysiological signal processing device that can measure EEG, ECG, and EMG signals with high sensitivity in noisy environments that would otherwise drown out weak signals. An on-chip system has been developed that shows a 20x improvement for saturation tolerance over existing systems of similar power, noise, and area.

UCLA Case No. 2014-404
LEAD INVENTOR: Dejan Markovic
Patent Status: Pending

BigFoot: Analysis, Monitoring, Tracking, and Sharing of Biomedical Features of Human Appendages

Many diabetic patients suffer from peripheral neuropathy, a disorder that results in the loss of sensation in their extremities. Individuals with this condition may develop severe infections from sores on the soles of their feet without their knowledge, which can lead to the loss of limbs. BigFoot uses customized software integrated with a commercial flatbed scanner that enables easy image acquisition and analysis of feet abnormalities. For patients that find checking their feet difficult, this tool can easily monitor, track data and share image data in order to identify abnormalities early and prevent complications.

UCLA Case No. 2014-132

LEAD INVENTOR: Aydogan Ozcan

Copyright Status: Pending

Method to Non-Invasively Determine Respiration Rate Using Pressure Sensors

UCLA researchers in the Department of Electrical Engineering have developed a noninvasive method for measuring respiratory rate. Although not required, the system is intended to be used when the patient is sleeping, either at home or in a clinical setting. While the user is lying on top of the mattress embedded with pressure sensors, the system calculates and displays the breathing rate of the user, which can be used to identify irregular breathing patterns. Of particular note is that the system can detect episodes of apnea and subsequently alert a medical professional or caregiver. The graphical user interface developed as part of the invention provides several additional features.

UCLA Case No. 2013-009

LEAD INVENTOR: Majid Sarrafzadeh

Patent Status: Pending

Networked Sensor Systems for Remote Patient Monitoring

Current methods to monitor sleep require patients to go to Sleep Monitor Centers with large electrophysiology, respiratory measurement, and motion measurement systems. UCLA researchers have developed an innovative Wearable-to-Enterprise Sleep Monitoring System to serve the market demand for Out of Center Sleep Testing (OCST) in adult patients. This technology combines monitoring, data archiving, reporting, usage assurance, and subject guidance. The system is comprised of wearable head, chest, and leg units. These units contain sensors for airflow, electroencephalography (EEG), electrooculography (EOG), electrocardiography (ECG), respiratory effort and rate, electromyogram (EMG), sleep time, motion, blood oxygen, auditory sensing, and actigraphy sensing measurements.

UCLA Case No. 2013-008

LEAD INVENTOR: William J. Kaiser

Patent Status: Pending - Pub. No. WO/2014/066059

NMR Probe for Detection of Microstructures

Nuclear Magnetic Resonance (NMR) spectroscopy is a widely-utilized method for analyzing small molecule compositions. However, NMR sensitivity is too poor for diagnostic purposes and has limited its use to academic research. A key component responsible for the sensitivity is the NMR probe, which holds the sample as it is inserted into the magnetic field. UCLA researchers developed a NMR probe with sensitivity superior to current designs. It contains a novel noise reduction mechanism, making it the most sensitive probe of its kind. These properties allow the detection of metabolites at the single cell level. Additionally, the probe has a planar configuration, making it ideally suited for microfluidic chips used for diagnosis and prognosis. It is also made with an ultra small detection region, 0.08 mm length by 0.05 mm width by 0.05 mm high, for samples of small volume and low concentration (such as biological samples).

UCLA Case No. 2012-550

LEAD INVENTOR: Louis Bouchard

Patent Status: Pending - Pub. No. WO/2014/011937

Corneal Hydration Sensing with THz Illumination

Proper corneal hydration levels are critical to maintaining optical vision. Researchers at UCLA have developed an imaging system to detect corneal hydration levels by illuminating the cornea with low power, low energy, terahertz (THz) frequency light and measuring the magnitude of the reflected THz signal. The system is capable of resolving 0.18% changes in the water concentration of the cornea in vivo and results suggest a ~3x increase in dynamic range over ultrasound-based pachymetry. This system can be used for detecting inflammation, immune responses, edema, or other disease in the cornea.

UCLA Case No. 2012-100

LEAD INVENTOR: Martin Culjat

Patent Status: U.S. Patent Issued - # 8,690,331

Exercise-based Entertainment Controller

To help combat childhood obesity, UCLA researchers in the Department of Electrical Engineering have developed an exercise-based entertainment controller system. The system allows children to use entertainment appliances, such as the television or computer, based on the amount of physical activity they have done throughout the day, recorded via a pedometer. When a child plugs the pedometer into their PC, the software retrieves data from the pedometer, and allots a time budget for the child to use entertainment appliances. When the time budget is exhausted, the power control module shuts off the corresponding appliance via an RF signal.

UCLA Case No. 2009-496

LEAD INVENTOR: Majid Sarrafzadeh

Patent Status: Pending - Pub. No. US 2013/0090213

Surgical Tools

Inferior Vena Cava Filter Retrieval Device

An inferior vena cava (IVC) filter is a medical device that is placed into the IVC to prevent life-threatening conditions such as pulmonary emboli. Removing the filter by pulling it back through the jugular vein requires easy access to the retrieval hook. There is a significant risk associated with the removal of an IVC filter. If the retrieval hook is in an inaccessible location in the body, then the risk is significantly elevated. Physicians at UCLA Department of Radiology have invented a new IVC filter retrieval system which can be used for extracting IVC filters when the hook is not accessible for capture with a snare (e.g. embedded in the vessel wall).

UCLA Case No. 2014-960
LEAD INVENTOR: Stephen Kee
Patent Status: Pending

Percutaneous Catheter for Lung Assist Device

Some patients with severe lung disease need to be treated with ECMO systems that oxygenate the blood using extra-corporeal, bedside machines. Currently used catheters for ECMO systems suffer from two primary disadvantages: blood that has already been oxygenated often gets re-circulated through the system; and the catheter's strong dependence on position results in inefficiencies when a patient inevitably moves. Dr. Ardehali has designed a catheter that overcomes these inefficiencies in ECMO catheter design by having both more stability during use and a better fluid flow design that reduces re-circulation.

UCLA Case No. 2014-642
LEAD INVENTOR: Abbas Ardehali
Patent Status: Pending

Covalt Uterine Removal System

When a hysterectomy is performed due to the presence of cervical cancer, the risk of causing cancer cells to be pushed into neighboring tissue and possibly grow into new malignant tumors is great. While specimen retrieval bags have been used in conjunction with uterine manipulators to avoid the spillage of cancer cells, some studies have reported that spillage still occurs over 10% of the time. Dr. Cohen has designed a specimen retrieval bag that utilizes air compression technology and attaches to the uterine manipulator in order to further reduce the spillage of cancer cells during hysterectomies and other tumor removal processes.

UCLA Case No. 2014-395
LEAD INVENTOR: Joshua Cohen
Patent Status: Pending

Image-Guided Irrigating Suction Cannula for Removal of Intracerebral Hemorrhage and Other Lesions

Intracerebral hemorrhages (ICHs) are potentially life-threatening conditions that occur when a blood vessel ruptures within the brain and causes an accumulation of blood. Dr. Neil Martin at UCLA has designed a simple multifunctional cannula system for performing minimally invasive image-guided evacuation of ICHs. After making a small burr hole in the skull, the cannula system is inserted toward areas of localized bleeding to both evacuate excess blood and irrigate the wound site until hemostasis is reestablished. With multiple instrument adapters, this system is capable of performing visual endoscope guidance, stereotactic image guidance, MRI image guidance, and computerized tomography image guidance. Additionally, Dr. Martin's instrument may be adapted to allow the use of a rotational clot or tissue fragmentation device for hematomas with higher levels of blood clotting.

UCLA Case No. 2014-320
Lead Inventor: Neil Martin
Patent Status: Pending

Organ Resuscitation Solution & System for Enhanced Liver Transplantation

Researchers in the Department of Surgery and UCLA Pfleger Liver Institute have developed a novel solution and system to minimize the tremendous degree of ischemia and reperfusion injury (IRI) associated with liver transplantation. The invention serves to replenish exhausted nutrients and resuscitate the organ before revascularization. In a swine model, use of the novel solution and system demonstrated enhanced liver function and improved survival compared to conventional approaches. This system may salvage livers, deemed to have incurred severe degree of ischemic injury and discarded, to transplantable organs. A solution and system to alleviate organ damage from IRI would have significant consequences on patient outcomes as well as the availability of transplantable organs.

UCLA Case No. 2012-292
LEAD INVENTOR: Johnny Hong
Patent Status: Pending - Pub. No. US 2014/0329221

A Video-Guided Chest Tube Insertion System

Dr. Robert Cameron, Professor of Clinical Cardiothoracic Surgery and Surgical Oncology in the Department of Surgery at UCLA, has designed a novel trocar system that supports real-time visual monitoring of chest tube placement. Thousands of chest tubes are placed annually into the pleural space of patients who have excessive air and/or fluid collapsing the lung. Currently, chest tube placement involves either a extremely painful "medieval" incision and clamp technique or a trocar/dilator system, both of which are "blind" procedures often leading to poor tube position, organ damage, and even death. Dr. Cameron's device capitalizes on existing medical video technology to provide real-time monitoring and guidance of anatomical position of the chest tube during placement.

UCLA Case No. 2012-287
LEAD INVENTOR: Robert Cameron
Patent Status: Pending

Lung Isolation System

Researchers at UCLA have invented a novel system that achieves reliable lung isolation using a standard large bore single lumen endotracheal tube, which maximizes compatibility with other devices. The system enables true dual lumen lung isolation/ventilation thus enabling all the benefits of both a double lumen tube and a bronchial blocker (the current methods of treatment) without the downsides of either. It also incorporates a video visualization system, thus precluding the need for traditional fiberoptic bronchoscopy.

UCLA Case No. 2011-739

LEAD INVENTOR: Nir Hoftman

Patent Status: Pending - Pub. No. WO/2013/188845

Robotic Micro-Surgery System

Researchers at UCLA have developed a robotic system that performs complete micro-surgical procedures by exactly mimicking the motion of a joystick controlled by a surgeon. The system incorporates multiple arms, which can be moved separately or in unison. Each arm holds a surgical instrument that is moved in real time, has high range of motion, and has access to a universal cartridge that facilitates connections for multiple utilities. The instrument precision is further refined by filtering and removing the natural tremor of the surgeon's hand. Additionally, because micro-surgery requires the instrument to mechanically maintain a fixed-point of rotation at the site of penetration, the system incorporates an integrated tracking system that allows the robot to compensate for patient movement. The tracking system also triggers automatic termination in the event that the patient moves beyond a determined threshold.

UCLA Case No. 2009-300

LEAD INVENTOR: Tsu-Chin Tsao

Patent Status: Pending - Pub. No. WO/2011/088400

Laser-based Bacterial Disruption for Treatment of Infected Wounds

Wound infections are difficult to treat because bacteria form biofilms that encase the bacteria. This barrier formed by the bacteria prevents white blood cells and antibiotics from entering and killing the bacteria. Researchers at UCLA have developed a novel technology using laser generated shockwaves to disrupt bacterial biofilms. Laser is applied to tissue coated with a thin metallic film. The metal absorbs the laser, exfoliates, and launches a mechanical stress wave (shockwave) through the tissue that disrupts the bacterial biofilms. A second wave is then generated through a gel containing nano-encapsulated antibiotics and silver nanoparticles, and the antibiotic and silver nanoparticles are propelled into the tissue. Thus, this technology not only disrupts the bacterial biofilms but also delivers antibiotics into the tissue.

UCLA Case No. 2009-230

LEAD INVENTOR: Warren Grundfest

Patent Status: Pending

Expandable Mechanical Distension Device for Hollow Organ Growth

Short gut syndrome is a condition in which patients have insufficient length of intestine to maintain normal digestion and absorption. In the United States, over 100,000 patients suffer from the disease each year. Researchers at UCLA have developed a device to mechanically stretch out the intestine through the application of longitudinal force. The device is made of shape memory materials such as nickel-titanium or biocompatible polymers. During implantation, the device is collapsed to its minimum size, followed by deployment into the intestinal tract via a push rod. The structure then binds to a particular location, and slowly expands over a period of several weeks. In doing so, it applies longitudinal force, resulting in the lengthening of the intestine.

UCLA Case No. 2009-227

LEAD INVENTOR: Greg Carman

Patent Status: Pending - Pub. No. WO/2010/124126

Notes:

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