

Hosted by:



MARYLAND

Stem Cell & Regenerative Medicine

Tech Showcase

April 29, 2025

The Rita Rossi Colwell Center
701 E Pratt Street,
Baltimore City, MD 21202

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MARYLAND

Stem Cell & Regenerative Medicine

Tech Showcase

A G E N D A

1:30 PM

DOORS OPEN, REGISTRATION, & SEATING

2:00 PM

WELCOME

- Ruchika Nijhara, PhD, MBA, [Executive Director, MSCRF](#)
- Ulyana Desiderio, PhD, [Senior Director, Department of Commerce](#)

2:15 PM

KEYNOTE ADDRESS

"The Sector Evolves Toward a Bright Future"

Michael Lehmicke, [Senior VP, Alliance for Regenerative Medicine](#)

2:40 PM

PITCH PRESENTATIONS I

- Poppy Wang, PhD, [SereNeuro Therapeutics, Inc.](#)
- Samson Tom, PhD, MBA, [Britecyte, Inc.](#)
- Luis Alvarez, PhD, [Therapdative, Inc.](#)
- Sam Kamali, PhD, [Caleo Biotechnologies, Inc.](#)
- Sashank Reddy, MD, PhD, [Lifesprout, Inc.](#)
- Ben Holmes, PhD, [Nanochon, Inc.](#)

3:45 PM

DEBATE

"Future of Manufacturing in Regenerative Medicine"

- Jessica Carmen, PhD, [Roslin CT](#)
- Patrick Hanley, PhD, [Children's National Hospital](#)

4:10 PM

BREAK

4:20 PM

PITCH PRESENTATIONS II

- Warren Grayson, PhD, [JHU](#)
- Carter Cliff, [Agnos Therapeutics, Inc.](#)
- Aki Ko, [Elixigen Therapeutics, Inc.](#)
- Michal Zalzman, PhD, [UMB](#)
- Brian Jamieson, PhD, [Diagnostic Biochips, Inc.](#)
- Vered Caplan, MS, [Orgenesis - CellVira, Inc.](#)

5:25 PM

KEYNOTE ADDRESS

Jay A. Perman, MD, [USM Chancellor](#)

5:30 PM

CLOSING KEYNOTE REMARKS

Aruna Miller, [Lieutenant Governor of Maryland](#)

5:45 PM

NETWORKING, POSTER SESSION & RECEPTION

REVIEW PANELISTS FOR PRESENTATIONS

Anthony Accorsi
[Blackbird Labs](#)

Daniel Flicker
[TID Fund](#)

Deborah Hemingway
[Ecphora Capital](#)

Anton Mihic
[McKinsey & Company](#)

Ted Olsen
[Blu Ventures](#)

Cathryn Paine
[Anzu Partners](#)

Brett Shealy
[J.P. Morgan](#)

David Warschawski
[W Ventures](#)

Sherman Williams
[AIN Ventures](#)

Tien Wong
[Opus8](#)



About Hosts

Maryland Stem Cell Research Fund



Established by the Governor and the Maryland General Assembly, Maryland Stem Cell Research Fund (MSCRF) was established to advance stem cell research and foster innovation in regenerative medicine. Since its inception, the fund has supported over 650 research projects from companies and academic institutions across a diverse range of disease areas, demonstrating its commitment to improving patient outcomes. By investing in cutting-edge science, MSCRF plays a pivotal role in transforming healthcare and promoting economic growth within Maryland's biotech sector.

Please visit the MSCRF website: mscrf.org

Maryland Department of Commerce



As the state's primary economic development agency, we stimulate private investment and create jobs by attracting new businesses, encouraging the expansion and retention of existing companies, and providing workforce training and financial assistance to Maryland companies. The Department also promotes the state's many economic advantages and markets local products and services at home and abroad to spur economic development and international investment, trade and tourism.

Please visit the Department of Commerce website: commerce.maryland.gov

Keynote Speakers



Aruna K. Miller
Lt. Governor, Maryland

Aruna Miller is the second woman to serve as Lieutenant Governor and the first woman of color and immigrant elected to statewide office in Maryland.

Miller served on the Ways and Means Committee and its Revenue, Transportation, and Education Subcommittees. Additionally, in her second term, she served on the Appropriations Committee, where she served as chair of the Oversight of Personnel Subcommittee, vice chair of the Transportation and Environment Subcommittee, and vice chair of the Capital Budget Subcommittee.

Dedicated to public service, she advocates for equity and opportunity. She earned a Bachelor of Science degree in civil engineering from the Missouri University of Science and Technology.



Jay A. Perman
Chancellor, USM

Jay A. Perman, MD, became the fifth chancellor of the University System of Maryland (USM) in January 2020. The USM enrolls more than 170,000 students in 12 universities and three regional higher education centers across the state, and confers nearly eight in every 10 bachelor's degrees awarded in Maryland.

As chancellor, Dr. Perman is committed to advancing higher education affordability for all students, and ensuring that every person in Maryland who wants a college education can access it. Over the last several years, the USM has grown the share of underrepresented minority students enrolled in system institutions, improved students' retention and completion rates, and boosted the amount of institutional aid awarded to students in need.



Michael Lehmicke
Senior VP, ARM

Michael joined ARM (Alliance for Regenerative Medicine) in 2018 as its first Director of Science and Industry Affairs. Michael has over 20 years of R&D experience in biomaterials, medical devices and regenerative medicine. He has led product development teams for class II devices, human cell and tissue-based products, and drug/device combination products. He is a creator and an inventor with multiple U.S. patents to his name.

Michael has a MSc in Biomedical Engineering, with a focus on tissue engineering, from Drexel University. Michael's areas of expertise include cell-based tissue engineering, bioceramics, biodegradable polymers, project management, strategic pipeline development, and business development.

Review Panelists



Anthony Accorsi, Blackbird Labs

Venture Partner at Blackbird Laboratories, where he is responsible for opportunity identification, scientific development, and strategic execution of Blackbird projects towards NewCo formation.



Daniel Flicker, T1D Fund

Joined the T1D Fund in January 2025. He was previously a Senior Associate at Novo Holdings, where he focused on biotech and medtech venture investing across a wide range of company stages and therapeutic areas. He received his Ph.D. in Systems Biology from Harvard University, where he completed a thesis on mitochondrial metabolism in brown adipose tissue, and his B.A. in biochemistry from Columbia University.



Deborah Hemingway, Ecphora Capital

Founder & Managing Partner of Ecphora Capital, a medtech VC firm in Baltimore. She's invested over \$15M in 11 startups, led 53 ventures, and holds a Ph.D. in biophysics. Her work focuses on medical device commercialization, strategic growth, and early-stage investment.



Anton Mihic, McKinsey & Company

Partner based in McKinsey & Company's New Jersey office. He serves clients in McKinsey's Life Science R&D practice across global PharmaCos, innovative Biotechs, MedTech and innovative Private Equity LS services companies.

Review Panelists



Ted Olsen, Blu Ventures

Partner at BLU Venture Investors and Next Gen Venture Partners. Previously, Ted was co-founder and Chief Executive Officer of Aqualith Advanced Materials Company. Prior to Aqualith, Mr. Olsen was the founder and CEO of PathSensors, Inc. a biotechnology company. Ted led the sale of PathSensors to Smiths Group in 2020.



Cathryn Paine, Anzu Partners

Partner with Anzu Partners, focused on human capital efforts including executive search and organizational analysis in investment diligence.

She is currently a Board Observer for EnchargeAI (Fund III) and was previously a Board Director for MultiMechanics (Fund I), which exited to Siemens in 2019. She was named to Venture Capital Journal's 2021 '40 under 40 Rising Stars in VC' list.



Brett Shealy, J.P. Morgan

Executive Director of Life Sciences at J.P. Morgan.

He has extensive experience in corporate banking within the life sciences and healthcare sectors, having held various leadership roles at both J.P. Morgan and Wells Fargo. At J.P. Morgan, Brett previously served as Executive Director and Relationship Executive in the Life Sciences & Healthcare division. Before that, he worked in corporate banking for Wells Fargo's Life Sciences division.



David Warschawski, W Ventures

Managing Director & Founder of W Ventures. In addition to being an avid entrepreneur and business owner, David has been an investor in numerous deals spanning early and mid-stage start-ups, real estate deals, founding completely new brands and companies, SPAC investing, and investing in publicly traded companies.

Review Panelists



Sherman Williams, AIN Ventures

Co-founder and Managing Partner of AIN Ventures. Sherman has an extensive history investing in dual-use technology subsegments, such as space technology and healthcare technology. Sherman has been the VC-in-Residence to several Techstars programs, including the Space Technology program where he has supported over 50 space technology startups. Sherman is also a Kauffman Fellow ('26). Sherman holds an MBA from the University of Chicago and a Bachelor of Science degree from the United States Naval Academy.



Tien Wong, Opus8

Chairman & CEO of Opus8, Inc., a private investment and advisory firm investing in exceptional life science and tech enabled services companies, as well as specializing in raising capital for promising tech companies and alternative investment fund managers. He is a graduate of Dartmouth College.

Pitch Presentations I

Executive Summaries and Bios

SereNeuro Therapeutics Inc.

SereNeuro Therapeutics is developing breakthrough non-addictive therapies for pain at scale. We are advancing SN101, a first-in-class, non-opioid, cell therapy intended to relieve chronic knee osteoarthritis pain and sequelae.

Dr. Poppy Wang's research uncovered the functional heterogeneity of human pain perception and identified novel targets, such as specific G-protein coupled receptors and ion channels, that could be modulated to treat chronic pain. This work formed the foundation for two promising therapeutic approaches that we are now advancing at SereNeuro.



Zhuolun (Poppy) Wang
Co-founder and Chief Scientific Officer
info@sereneuro.com

Britecyte, Inc.

Britecyte, Inc. is a biotechnology company pioneering the development of regenerative medicine therapies. With a focus on the biocompatibility of tissues and cells, Britecyte is redefining the field of regenerative medicine through the development of groundbreaking tissue transplantation solutions to address unmet medical needs for many diseases and conditions. Committed to shaping the future of regenerative medicine, Britecyte continues to drive progress in the field with cutting-edge technology and a patient-centered approach. For more information, visit www.britecyte.com.

Dr. Samson Tom is an experienced business, science, and clinical leader with more than 25 years of innovative experience in the development and commercialization of advanced biologics, drugs, devices, and tissue-based products.



Samson Tom
President and Chief Executive Officer
stom@britecyte.com

Theradaptive, Inc.

Theradaptive is an MIT spin out in Phase I/II clinical studies with a new class of regenerative therapeutic protein that is positioned to disrupt and capture the musculoskeletal, spinal, and dental graft markets, and become the dominant product in a \$4B US market. Our lead product has three FDA breakthrough designations, and we are the only company currently enrolling in FDA-approved IDE trials for spinal fusion. Theradaptive has built a faster acting, more effective, significantly less expensive, targeted product that does not leak to unintended areas. Theradaptive has engineered a foundational protein technology that enables ultra-persistent local delivery of therapeutic proteins to minimize off-target side effects.

Mr. Luis Alvarez developed the concept for targeted regeneration platform during and following a combat tour in Iraq where several of his soldiers suffered extremity injuries.



Luis Alvarez
CEO and Founder
contactus@theradaptive.com

Pitch Presentations I

Caleo Biotechnologies, Inc.

The global preclinical landscape for fibrotic diseases faces a substantial innovation gap due to limitations in existing ex-vivo models. Traditional animal-based models frequently fail to recapitulate the complexity of human disease pathology. To bridge this gap, CaleoBio is pioneering next-generation, patient-derived preclinical models designed to accelerate the development of effective therapies for inflammatory bowel disease (IBD) and other fibrotic diseases.

With over 14 years of end-to-end expertise in disease modeling and stem cell biology, Dr. Sam Kamali developed CaleoBio's innovative Organ-Dish platform and has been instrumental in strategically guiding its progression from concept to industry adoption, and commercialization.



Sam Kamali

CEO and Co-founder
info@caleobiotechnologies.com

Lifesprout, Inc.

Lifesprout is developing revolutionary products for aesthetic and regenerative medicine. Leveraging recent breakthroughs in materials science, we have created a platform that looks and behaves like the body's own tissues. We are turning this into a suite of products for the millions of patients each year with soft tissue losses from aging, cancer, and metabolic disease. Our next generation products enhance form and function with minimal downtime and superb results.

Dr. Sashank Reddy is Assistant Professor of Plastic and Reconstructive Surgery at the Johns Hopkins University School of Medicine and Medical Director of Johns Hopkins Technology Ventures. Dr. Reddy is also an accomplished entrepreneur and biomedical innovator.



Sashank Reddy

Co-Founder and President
sreddy6@jhmi.edu

Nanochon, Inc.

Nanochon's mission is to develop a new approach to treat cartilage replacement and repair so that the hundreds of thousands of young, active patients with knee damage can return to their lifestyles without having to undergo costly and invasive short-term fixes. Nanochon's Chondrograft™ device is a sturdy medical advancement that is one part orthopedic load-bearing implant, one part tissue growth scaffold, and completely revolutionary. Our implant replaces lost or damaged cartilage and encourages new growth using innovative nanomaterial and 3-D printed designs. This technology has the potential to provide a more successful, faster, longer-lasting, and more affordable solution to joint disease and injury.

Dr. Ben Holmes has backgrounds in biomedical engineering from UVA and GWU, company formation, and early stage medical device executive management.



Ben Holmes, Nanochon

Co-Founder and CEO
info@nanochon.com

Pitch Presentations II

Dr. Warren Grayson and his team address the challenges associated with spatio-temporal control of stem cell fate in order to regenerate large composite tissue defects. We are developing innovative methods to guide stem cell differentiation patterns and create patient-specific grafts with functional biological and mechanical characteristics. We employ engineering techniques to accurately control growth factor delivery to cells in biomaterial scaffolds as well as to design advanced bioreactors capable of maintaining cell viability in large tissue constructs. These technologies are used to enable precise control of the cellular microenvironment and uniquely address fundamental questions regarding the application of biophysical cues to regulate stem cell differentiation.



Warren Grayson
Johns Hopkins University
Director, Translational Tissue Engineering Center
wgrayson@jhmi.edu

Agnos Therapeutics, Inc.

Agnos Therapeutics mission is to dramatically improve the standard of care for millions of patients suffering from inherited blindness. Our published and proprietary data demonstrates the efficacy of our product to rescue retinal function across multiple preclinical models of retinal degeneration. Agnos is developing an off-the-shelf retinal cell drug product (AGN-001) designed to treat the majority of patients with inherited blindness, regardless of which mutation causes their condition. AGN-001 is manufactured from induced pluripotent stem cells (iPSCs) using proprietary methods and compositions.



Carter Cliff, Agnos Therapeutics
President
carter@dlasp0ra.com

Mr. Carter Cliff has raised over \$250 Million as a biotech co-founder, including Opsi Therapeutics and Kenai Therapeutics. Opsi partnerd with pharma with a \$70 Million up-front. Kenai raised an \$83 Million Series A.

Elixirgen Therapeutics, Inc.

Elixirgen Therapeutics is a clinical-stage RNA therapeutics company focused on the discovery and development of innovative therapies, including cell and gene therapies. The company is advancing three technologies to develop therapeutics for a broad spectrum of diseases including rare and genetic diseases, and aging-related disorders.

Bobcat mRNA™ technology uses a proprietary mRNA design to deliver large payloads such as full-length dystrophin, which is mutated in Duchenne muscular dystrophy. Preclinical data have demonstrated restoration of muscular function in DMD model mice with no safety findings associated with administration or treatment. Controllable self-replicating (c-srRNA™) technology controls the powerful gene expression of self-replicating RNA to reduce off-target effects and improve efficacy.



Aki Ko, Elixirgen Therapeutics
CEO and Co-Founder
info@elixirgentherapeutics.com

Pitch Presentations II

Neuro-DeepFreeze (NDF-3D) is a multi-patented bioprinting platform that creates human-scale, neural tissues from adult-stem cells without genetic manipulation. These constructs form mature neuronal networks and maintain viability during printing at -80°C , enabling cryopreservation and reproducibility. With tissues reaching 30 mm, NDF-3D far exceeds the size and structural fidelity of other models. The platform serves a dual market: a near-term opportunity in CNS drug screening (projected at \$3B+), and a long-term path toward stroke therapy and brain tissue regeneration (\$30B+ market).

Dr. Michal Zalzman is a leader in stem cell biology and the lead inventor of the Neuro-DeepFreeze technology. She holds patents on both the stem cell derivation method and the 3D bioprinting process that enable the creation of viable neural tissue at unprecedented scale.



Michal Zalzman

University of Baltimore

Assistant Professor, School of Medicine
mzalzman@som.umaryland.edu

Diagnostic Biochips Inc.

Diagnostic Biochips is addressing the urgent need for improved pre-clinical neurological data to allow the development of next generation therapies such as drugs, genetic therapies, and medical devices. Enormous attention and resources are being devoted to improving the quality of scientific data that informs early decisions about drug efficacy and safety. DBC's tools provide a sensitive and translatable measure of excitable cell function, allowing drug developers to finally exploit the full potential of powerful new iPSC (induced pluripotent stem cell) cultures in the drug discovery process, leading to better therapies developed with lower cost and risk.

Dr. Brian Jamieson has nearly thirty years of experience leading technical teams in technology and new product development at NASA and in private industry, including as founder of a product development company (2006-2018, sold to Hyperion, Inc.)



Brian Jamieson

Founder and CEO
info@cambridgeneurotech.com

Orgenesis - CellVira Inc.

Orgenesis is a global biotech company focused on a decentralized approach to cell and gene therapies, featuring a cost-efficient, scalable manufacturing process. Its Maryland-based subsidiary, CellVira, is developing a platform using mesenchymal stem cells (MSCs) as carriers for oncolytic viruses (OVs), addressing the rapid immune neutralization of OVs and directly targeting brain tumors for glioblastoma treatment. This approach addresses OV therapy's limitation of rapid immune neutralization, as MSCs naturally target tumors and modulate immune responses, making them ideal for delivering OVs directly to cancer sites.

Vered Caplan, CEO of Orgenesis Inc., has an engineering background. She has founded and lead more than 15 medical device and biotech companies before moving into cell and gene therapies in 2014 with Orgenesis.



Vered Caplan

CEO
info@orgenesis.com

Debate

Future of Manufacturing in Regenerative Medicine

This session will explore one of the most pressing questions in the future of regenerative medicine—should manufacturing be centralized for efficiency and scale, or localized for flexibility and responsiveness? We'll dive into the trade-offs between control, cost, quality, and access through an *Oxford-style debate*.

Discussion that highlights the real-world implications for innovation, commercialization, and patient care.



Patrick Hanley

Children's National Hospital

Dr. Hanley is the Chief and Director of the Cellular Therapy Program and an associate professor of pediatrics at Children's National Hospital and the George Washington University. He is also the founder of CHARM, a mid-Atlantic regional network connecting the field of cell and gene therapy.



Jessica Carmen

RoslinCT

Dr. Carmen brings over 20 years of experience in the cell and gene therapy industry. Previously, she was Vice President of Business Development for Kincell Bio, a contract development and manufacturing Organization (CDMO) focused on cell therapies. In a consulting capacity, she supported the business development team at Oxford Biomedica, a manufacturer of clinical and commercial viral vectors.

Company Posters Summaries



SereNeuro Therapeutics

Developing breakthrough non-opioid advanced therapy treatments for pain

Project Abstract: Osteoarthritis (OA) is a widespread condition that causes significant chronic pain and limits mobility for millions of people worldwide, particularly in the knees. Current treatments often rely on opioids, highlighting the urgent need for better, safer solutions. Recent advances in stem cell technologies offer new hope for pain management. In this study, we investigated the use of SN101, a specialized human induced pluripotent stem cell (hiPSC)-derived nociceptor cell product, to modulate chronic pain in OA. SN101 cells closely resemble natural human pain-sensing neurons and respond to painful stimuli.

Presenter: Tea Soon Park



Britecyte

Britecyte, Inc. is a biotechnology company pioneering the development of regenerative medicine therapies.

Project Abstract: The fat pad on the bottom of the foot serves as a shock absorber, protecting underlying tissue during weight-bearing activities. Atrophy or displacement of this fat pad increases plantar pressure on the bones, leading to pain, disability, and possible ulcerations. Reducing pressure is imperative for preventing ulcer formation and recurrence; however, existing treatments are primarily limited to shoe pads. An off-the-shelf cryopreserved human adipose tissue allograft (CAT), which preserves the native structure and inherent properties of adipose tissue, is designed to reduce pressure via restoration of the fat pad. This case series evaluates the utilization of CAT in patients at risk of developing plantar ulcers.

Presenter: Alla Danilkovitch



Theradaptive

Theradaptive is developing a therapeutic delivery platform for multiple clinical indications including immuno-oncology, orthopedics and soft tissue repair.

Project Abstract: Degenerative spinal conditions have a tremendous global impact on lost productivity and diminished quality of life. When a spinal fusion surgical procedure is performed to reduce pain and motion at the affected spinal segment, bone graft material is implanted in the disc space or along the posterior aspects of the spine to assist the fusion process. The gold standard of grafting material is autograft from the iliac crest, despite the risk for pain and other adverse events associated with the harvest procedure. The most common autograft replacement incorporates a recombinant osteoinductive protein, rhBMP-2. While bone forming capability with the commercially available rhBMP-2 formulation is excellent, specific adverse events have been associated with off-label use in spinal fusion procedures, including bone resorption and heterotopic bone formation. AMP2 is a variant of rhBMP-2, designed to bind specifically to the ceramic component of a carrier matrix to limit off target effects and provide precise localization of new bone formation. OsteoAdapt SPTM bone graft contains AMP2 bound to electrospun fibers of Poly Lactic-co-Glycolic Acid (PLGA) containing beta-tricalcium phosphate (bTCP) particles. A series of preclinical studies was performed in different animal species, varying the dose and concentration of AMP2. These data were analyzed to determine appropriate dose and concentrations for human Phase I/II feasibility studies.

Presenter: David Stewart

Company Posters Summaries



Caleo Biotechnologies

Pioneering next-generation, patient-derived preclinical models designed to accelerate the development of effective therapies for inflammatory bowel disease and other fibrotic diseases.

Project Abstract: Inflammatory Bowel Disease (IBD), including Ulcerative Colitis (UC) and Crohn's Disease (CD), remains a major unmet clinical need. Despite the increasing prevalence of IBD in recent years, impacting approximately 3 million adults in the United States, there are few treatment strategies that directly target its pathogenesis. Current therapies often induce temporary remission but fail to prevent relapse, and many patients cycle through multiple regimens with limited efficacy and adverse effects.

To address this gap, Caleo Biotechnologies introduces a patient-derived Organ-Dish (OD) platform as a new gold standard for IBD preclinical studies. Our IBD-derived OD models (IBODs) incorporate epithelial, stromal, and immune cell types working in concert to faithfully recapitulate the in-vivo architecture and function of diseased intestinal tissue. This physiological relevance enables more predictive drug testing, mechanistic studies, and patient-specific modeling. We have successfully established proof-of-concept that IBODs recapitulate disease-relevant phenotypes both ex-vivo and in-vivo. Ongoing efforts are focused on validating the platform against standard-of-care therapeutics, assessing morphological and molecular responses, and optimizing scalability for preclinical testing. These studies lay the groundwork for more precise and efficient drug development platform in IBD and other fibrotic diseases, positioning our technology as a powerful tool for advancing personalized medicine, accelerating biomarker discovery, and reducing attrition in clinical trials.

Presenter: Sam Kamali



Diagnostic Biochips

Addressing the urgent need for improved pre-clinical neurological data to allow the development of next generation therapies such as drugs, genetic therapies, and medical devices.

Project Abstract: Enormous attention and resources are being devoted to improving the quality of scientific data that informs early decisions about drug efficacy and safety. DBC's tools provide a sensitive and translatable measure of excitable cell function, allowing drug developers to finally exploit the full potential of powerful new iPSC (induced pluripotent stem cell) cultures in the drug discovery process, leading to better therapies developed with lower cost and risk.

DBC is a growing team of 8 engineer/scientists that has developed a robust commercial product and seeks capital to scale instrument sales in the biopharma market. Brian Jamieson, Ph.D. (Founder and CEO) has nearly thirty years of experience leading technical teams in technology and new product development at NASA and in private industry, including as founder of a product development company (2006-2018, sold to Hyperion, Inc.)

Fan Wu, Ph.D. (VP Product Development) is a recognized leader in neural interfacing, sensor development, micro-fabrication and the application of Machine Learning to challenging biological problems.

Presenter: Brian Jamieson

Company Posters Summaries



HOH Cells

HOHCells, LLC has been dedicated to developing and manufacturing ingenious products and devices for cell culture, banking, analysis, and therapy, and for drug screening.

Project Abstract: Human induced pluripotent stem cells (iPSCs) show great promise for personalized medicine, as they can be reprogrammed from somatic cells in easy-to-access organs (e.g., skin) and differentiate into cells of all three germ layers without any ethical concern. However, large-scale production of human iPSCs in 3D is indispensable for cell-based medicine. We discovered that ROCK inhibitor (RI, 10 μ M in concentration) that has been commonly used for 3D culture of human iPSCs to improve their viability and yield, significantly compromises their quality. To address this issue, we developed a novel method of cold-triggered detachment of human iPSCs for culture in 3D with high viability (~100%), yield, and quality without using RI.

However, the device for the novel method needs to be made fresh and has a short shelf life at room temperature, which is not ideal as a commercially available product. Therefore, we will further develop the device to have a long shelf life for RI-free 3D culture of human iPSCs, as the first specific aim of this project. In the same line, for the human iPSCs and their derivatives as commercially available products, they must be banked via cryopreservation for convenient distribution and ready-availability. We have successfully developed a novel natural sand-based technology to improve the banking of human iPSCs and mouse ovarian follicles. We will further develop this technology for banking the 3D human iPSC-derived mesenchymal stem cells (iMSCs) with high post-cryopreservation functional survival, as the second specific aim of this project. In summary, this project will develop two ingenious technologies for 1) RI-free production of 3D human iPSCs with high viability, yield, and quality and 2) cryopreservation of 3D human iMSCs with high viability, yield, and quality. Both technologies/devices are of urgent need for the understanding, drug-screening, and treatment of various diseases, particularly in a personalized manner.

Presenter: Xiaoming He



Phycin

Biotechnology company pioneering the sustainable production of high-performance recombinant growth factors using *Chlamydomonas reinhardtii*, a species of green microalgae.

Project Abstract: Leveraging a proprietary dual-expression platform capable of expressing proteins from both the chloroplast and nuclear genomes, Phycin has developed engineered versions of bFGF and EGF with significantly enhanced resistance to thermal degradation and protease digestion. These innovations directly address longstanding challenges in the cell and organoid culture and regenerative medicine industries, where instability and high costs of conventional growth factors hinder scalability and performance.

In addition to building a catalog of algae-derived growth factors as biotools, Phycin is actively advancing engineered growth factors as regenerative therapies for the treatment of corneal injury, tympanic membrane perforation, and general skin wounds. Preclinical animal studies have demonstrated strong efficacy, driven by the improved stability and bioavailability of the engineered proteins.

Presenter: Jun Wang

Company Posters Summaries



Reprocell

Our current portfolio includes an extensive product catalog to support stem cell research and 3D bioengineered tissues, a commercial biorepository of ethically sourced human tissues, extensive clinical networks across the USA and Europe that enable our contract research services in human ex vivo living tissues, and our capability to supply induced pluripotent stem cells (iPSCs) for both research and clinical applications.

Project Abstract: Abstract: REPROCELL USA offers comprehensive services for the production and application of clinical-grade induced pluripotent stem cells (iPSCs). Utilizing our proprietary 5th Gen StemRNA™ Clinical Reprogramming Technology, REPROCELL USA generates iPSCs from donor fibroblasts under stringent GMP compatible conditions. The process begins with the collection of tissue from eligible donors, followed by reprogramming to iPSCs and concludes with extensive quality control to ensure clinical suitability.

These iPSCs can subsequently be used to generate GMP Master Cell banks (MCBs) compliant with FDA, EMA, and PMDA regulations. We have also differentiated these iPSCs into clinical grade mesenchymal stem cells (iMSCs) which are highly sought after for their therapeutic potential in treating inflammatory diseases and promoting tissue repair and regeneration. Due to an increased local demand for access to cell and gene therapy project starting material, REPROCELL USA has recently expanded its clinical grade iPSC and iMSCs production capabilities to include GMP grade iPSC and iMSC production at its Beltsville facility. With its global access to ethically sourced human tissue samples and rigorous screening protocols, REPROCELL USA can provide high quality material for cell and gene therapy projects at any scale.

Presenter: Evelyn Chukwurah



Secretome Therapeutics

Secretome Therapeutics is a biotechnology company pioneering a new class of regenerative therapies based on the complete secretome of neonatal cardiac mesenchymal stem cells.

Project Abstract: Friedreich's Ataxia (FRDA) is a debilitating neurodegenerative disorder caused by frataxin deficiency, leading to mitochondrial dysfunction and impaired energy metabolism. While no curative therapy exists, stem cell-derived secretomes offer promising regenerative potential through paracrine mechanisms. Here, we evaluate the therapeutic effect of STM-21, a proprietary secretome derived from neonatal cardiac mesenchymal stem cells (nMSCs), on mitochondrial function in FRDA fibroblasts. STM-21 treatment significantly increased mitochondrial ATP production while reducing glycolytic dependency in FRDA cells. A marked improvement in spare respiratory capacity and maximal OCR was observed. Seahorse energy maps revealed a phenotypic shift from quiescent to energetic in STM-21-treated FRDA fibroblasts. MitoSOX data showed reduced mitochondrial ROS levels. Protein analysis identified key mitochondrial and metabolic targets upregulated post-treatment. A dose-dependent enhancement in mitochondrial bioenergetics was confirmed. These findings demonstrate that STM-21 secretome therapy restores mitochondrial function in FRDA fibroblasts, offering a novel cell-free therapeutic approach for mitochondrial disorders. This work supports further translational development of STM-21 in regenerative medicine applications for neurodegenerative and energy-deficient diseases.

Presenter: Vinay Jindal

Company Posters Summaries



Nanochon

Our focus is to deliver highly-effective, off-the-shelf solutions that allow sports medicine physicians help their patients return to the activities that they love.

Project Abstract: Nanochon's Chondrograft™ is a functional 3-D cartilage implant made through the unique combination of synthetic micro/nanomaterial and 3-D printing. Chondrograft™ harnesses the inherent capacity of stem cells to recognize and respond to their environment favorably. Our material, while synthetic, mimics the porosity and structure of natural collagen fibers that exist in cartilage. By 3-D printing the material into a highly organized, interconnected 3-D structure, Chondrograft™ can integrate with the body by absorbing blood and supporting stem cell attachment when implanted. Over time, resident stem cells interact with the material to form new cartilage. Due to the mechanical robustness of Chondrograft™, it can be delivered arthroscopically, allowing for shorter return-to-mobility. Collectively, this yields a minimally-invasive and durable implant leading to shorter recovery periods and increased patient satisfaction.

Presenter: Ben Holmes



Materic

Materic develops a range of advanced materials for use in tissue engineering, flexible electronics, textiles, and more.

Project Abstract: Nanofiber cell scaffolds for tissue engineering and regenerative applications.

Presenter: Ronish Shrestha



CHARM

Capital Health and Mid-Atlantic Regenerative Medicine (CHARM) is a growing regional network focused on strengthening collaboration and advancing workforce development in cell and gene therapy.

Project Abstract: Since launching after our first symposium in 2023, CHARM has brought together more than 200 members from over 120 organizations across the DC, Maryland, and Virginia area — including academic centers, biotech companies, government agencies, and community colleges. Through quarterly meetups, a webinar series (CHARMing Webinars), and an annual symposium, we provide space for members to share knowledge, spark new partnerships, and highlight the innovative work happening across the region. CHARM is building a connected, collaborative CGT community in the Mid-Atlantic — one event, one conversation at a time.

Presenter: Patrick Hanley

Academic Posters Summaries

Dr. Mirosław Janowski's Lab

Project Abstract: Genome editing represents medicine's new frontier, yet treating diseases post-diagnosis often comes too late to restore patients to their premorbid state. With the imminent surge in neonatal sequencing and increasing placental tissue banking at birth, rich in mesenchymal stem cells (MSCs), we've identified a crucial opportunity: using these readily available MSCs as ideal testbeds for non-invasive genome editing strategy screening, eliminating the need for invasive biopsies or expensive iPSC derivation. In this way, a new opportunity is emerging for early, personalized therapeutic strategies.

Our patent-pending approach achieves remarkable efficacy (up to 85%) in correcting point mutations within primary MSCs. Considering that most genetic diseases result from single-nucleotide errors and given rapid advances in safer, more efficient single-nucleotide editing technologies, our innovation holds tremendous value for the medical community and parents alike. Parents could proactively explore potential editing strategies following neonatal sequencing before disease manifestation.

Despite numerous AI-powered tools for designing guideRNAs with predicted efficacy and off-target assessments, our experimental work on frequent TSC2 gene mutations—TSC2.1864C>T (p.Arg622Trp), TSC2.1832G>A (p.Arg611Glu), and TSC2.5024C>T (p.Pro1675Leu)—revealed significant discrepancies between AI predictions and actual experimental outcomes. These findings demonstrate that current AI tools cannot be relied upon exclusively for predicting genome editing efficacy.

This creates a compelling business opportunity: developing comprehensive genome editing screening services that not only provide practical editing solutions for parents and doctors but simultaneously improve AI prediction accuracy through expanded experimental datasets. Such a dual-purpose approach addresses immediate clinical needs while advancing the field's technological capabilities.

Presenter: Abdallah Salemdawod

Dr. Elias Zambidis's Lab

Project Abstract: Proteogenomic Reprogramming to a Functional Human Blastomere-like Stem Cell State via a PARP-DUX4 Regulatory Axis. We show that conventional, primed human pluripotent stem cells (hPSC) cultured with non-specific tankyrase-PARP1-inhibited naïve reversion conditions underwent proteogenomic reprogramming to a functional blastomere-like state. Tankyrase/PARP inhibitor-regulated naïve stem cells (TIRN-SC) concurrently expressed hundreds of blastomere-specific pioneer factors in hybrid, multi-stage 2C-8C-morula-ICM transcriptional programs that were augmented by expression of the ZGA-priming factor DUX4.

Injection of TIRN-SC into 8C-staged murine embryos efficiently and equipotently directed human cell contributions to extra-embryonic and embryonic compartments of chimeric blastocysts and feti. Ectopic expression of a murine E-cadherin transgene in TIRN-SC further enhanced chimeric tissue targeting. TIRN-SC-derived trophoblast stem cells (hTSC) efficiently generated interspecific placental chimeras. Proteome-ubiquitinome analyses revealed increased TNKS and reduced PARP1 levels in TIRN-SC, and a globally ADP-ribosylation-deficient, hyper-ubiquitinated proteome that impacted expression levels of tankyrase and PARP1 substrates. ChIP-Seq of NANOG-SOX2-OCT4 and PARP1 (NSOP) revealed genome-wide NSOP co-binding at DUX4-accessible enhancer regions of embryonic lineage factors; suggesting a DUX4-NSOP axis regulates lineage plasticity in PARP-deficient TIRN-SC. TIRN-SC may serve as a valuable model for studying the proteogenomic regulation of pre-lineage human embryogenesis.

Presenter: Elias T. Zambidis

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Dr. Djordje Atanackovic's Lab

Project Abstract: Phase I clinical trial of tri-specific CD19/20/22 CAR-T in patients with relapsed/refractory B-Cell lymphomas

Presenter: Samuel Weeks

Dr. Catherine Kuo's Lab

Project Abstract: An estimated 6–7 million tendon ruptures occur each year globally, representing a widespread and economically costly clinical reality, as tendons lack the ability to regenerate and there are no tendon-specific therapeutics to treat tendon injuries. Injured tendons heal as fibrotic scar tissue with abnormal tissue composition and mechanical properties, leading to high rates of chronic pain, work disability, poor quality of life, and high risk of reinjury. Over the last decade, the Kuo Laboratory has discovered key physicochemical factors that regulate the development of tendon mechanical properties during tissue formation, and is using this knowledge to inform the development of tendon regenerative medicine strategies. The novel therapeutic in development is a biologic that can be delivered via injection directly at the injury site during healing to promote native tendon mechanical properties, musculoskeletal function, and resistance to (re)injury. Potential customers include patients with tendon injuries and the medical providers who treat them. Tendon injuries occur in patients who perform manual labor and/or repetitive actions. They also occur in the sedentary and obese populations. The general population, military personnel, and recreational, professional and collegiate athletes would also all benefit from the proposed technology. Healthcare providers would benefit from demand for this therapeutic across an expansive patient population. Insurance companies would benefit from reduced claims for work disability.

Presenter: Catherine Kuo

Dr. Luis Garza's Lab

Project Abstract: The use of ectopic volar fibroblasts to modify skin identity. We are currently focused on cellular therapy and the role of fibroblasts in modulating the function of neighboring keratinocytes. Our research explores cell-cell communication, cellular engraftment, and mechanisms for maintaining tissue identity. This work is culminating in an FDA-approved clinical trial using cellular therapy in both healthy subjects and amputees to modify skin identity.

The clinical goal is to improve stump-site skin in amputees. Before achieving full limb regeneration, we aim to regenerate the thick, durable skin of the palms and soles ("volar" skin) at the stump site to prevent breakdown and bruising from prosthetic use.

The Cell Center at Johns Hopkins Hospital facilitates the extraction and expansion of patient-derived fibroblasts. Luis Garza, MD, PhD, serves as the principal investigator, overseeing the overall project with a particular focus on clinical aspects, including cell injections into the leg area of healthy subjects in collaboration with research nurses and coordinators. Sam Lee, PhD, supervises lab bench work, focusing on data analysis, including histology, morphology, single-cell, and spatial transcriptomics. Based on these findings, our team continuously refines the treatment regimen to optimize cellular therapy.

Presenter: Sam Lee

Academic Posters Summaries

Dr. Tao Lowe's Lab

Project Abstract: There are over 150 million new bone fractures globally each year. Bone defects incapable of self-healing altogether, or critical sized bone defects (CSBDs), require highly invasive surgical treatment. To treat CSBDs, bone grafts are commonly used during reconstruction but are either scarce or lack the essential growth factors and shaping capabilities for mature bone formation. To enhance endogenous bone healing on a bone graft or implant, growth factors can be delivered locally to a defect site. However, their short half-lives and high costs make these compounds challenging to deliver to induce a therapeutic response without side effects.

The objective of this work is to construct 3D-print polycaprolactone-allograft (PCL-ALLO) constructs coated with bone morphogenetic protein-2 (BMP-2)-loaded nanogels (BNGs) to aid in CSBD healing. BMP-2 was loaded into nanogels composed of poly(N-isopropylacrylamide)-dextran-poly(lactate-2-hydroxyethyl-methacrylate) by UV emulsion polymerization.

The presented fabrication strategy, using a commercial fused deposition modeling (FDM) printer, can produce bone constructs with interconnected pores ranging from 250–750 μm while encapsulating up to 30 wt % allograft. Despite allograft encapsulation, the PCL-allograft (PCL-ALLO) hybrids are mechanically stiff like native bone. In addition, the constructs and nanogels are biocompatible while enabling strong nanogel localization and cellular growth. BMP-2 released from nanogels remained bioactive, sustained its release for over 2 months, and can be tailored by altering nanogel macromer hydrophobicity and crosslinking density. The combination of 30 wt% Allo constructs and nanogels additively enhanced stem cell alkaline phosphatase expression and critical-sized calvarial defect healing in rats, while BNGs facilitate slow mineralization output from stem cells. Completion of the project will have a significant impact on healing patient-specific and defect-specific bone regeneration.

Presenter: Eman Mirdamadi

Dr. Chulan Kwon's Lab

Project Abstract: CRISPR-Cas9 is a powerful gene editing tool widely used for correcting pathogenic mutations. However, when mutations are located within exons, precise correction is essential to avoid unintended outcomes. Despite its potential, CRISPR-Cas9's accuracy remains suboptimal, particularly in in vivo settings, where complete and targeted sequence correction is currently unfeasible. To overcome this limitation, we developed a novel method using spliceable microexons (SMEs)—short exon-like sequences—to either skip mutated exons or restore reading frames by inserting microexons. This strategy allows correction without directly editing the mutated region, thus avoiding the risks associated with traditional genome editing.

We first applied this approach to a splicing mutation in FLNC. Patient-derived PBMCs were reprogrammed into hiPSCs and subsequently differentiated into cardiomyocytes. Using the SME sequence, we successfully inserted a microexon to correct splicing defects in FLNC, validated by minigene assays and CRISPR-engineered hiPSC models. Building on this success, we are expanding our strategy to Duchenne Muscular Dystrophy (DMD). Dystrophin deficiency in DMD leads to muscle degeneration and cardiac dysfunction, with no current cure. Although CRISPR-Cas9 has shown potential through exon skipping or frame correction, its dependence on NHEJ and guide RNA design limitations restrict therapeutic applicability. Our SME-based method offers a precise, exon-independent strategy to restore dystrophin expression by introducing functional microexons. Ultimately, our study establishes a proof-of-concept for SME-based genome engineering. This approach has broad translational potential across multiple genetic disorders involving splicing and frameshift mutations, offering a promising alternative to traditional gene editing methods.

Presenter: Seunghyun Lee

Academic Posters Summaries

Dr. Sarah Sunshine's Lab

Project Abstract: Patients with ocular Graft versus Host Disease (oGvHD) are a critical patient population with a unique autoimmune-like ophthalmic disease. oGvHD affects approximately 50% of individuals who receive an allogeneic hematopoietic stem cell transplant (HSCT) and is a debilitating aspect of GvHD. oGvHD symptoms range from dry eye to chronic pain as a result of inflammation, ultimately resulting in chronic corneal epithelial disease that is insufficiently managed and treated with currently available therapies. Current standard of care treatments for oGvHD inadequately control the patients' disease and do not target the promotion or regeneration of healthy epithelial tissue. Our team at the University of Maryland under Dr. Sarah Sunshine participated in a multi-center clinical trial to determine if the subconjunctival application of allogeneic mesenchymal stem cells (MSCs) will improve the epithelial health in patients with oGvHD. The primary outcome is photo-documented epithelial staining while secondary outcomes include corneal stromal haze and thinning, best-corrected visual acuity, and patient-reported visual function outcomes. Ultimately, we hypothesized that the application of allogeneic MSCs will significantly promote tissue repair and regeneration to improve ocular surface health compared to the standard of care, minimizing sequelae.

Presenter: Cristina Pontaza

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