STEMCELL-2026
ABSTRACT BOOK

2ND INTERNATIONAL CONFERENCE ON

STEM CELLS, REGENERATIVE MEDICINE & TISSUE ENGINEERING

April 13-14, 2026 | Hotel Inn Paris CDG Airport, Paris, France

FOREWORD

The 2nd International Conference on Stem Cells, Regenerative Medicine & Tissue Engineering (STEMCELL 2026) was held on April 13-14, 2026, in Paris, France. The two-day conference will include plenary and keynote lectures by experienced experts and Oral talks, Poster presentations and Exhibitions.

The main objective of the meeting is to promote contacts between scientists working in Stem Cells, Regenerative Medicine and Tissue Engineering, in order to share experiences, to spread the latest information on progress in their specialties and related fields, to gain visibility for their research, to put young researchers interacting with their peers and seniors, and to develop professionally.

We sincerely hope that STEMCELL-2026 serves as an international platform for bringing together researchers from around the world, fostering new collaborations, and expanding professional networks.

We look forward to welcoming you to Milan for this inspiring congress in 2027!

ORGANIZING COMMITTEE MEMBERS

Dr. Stefan Bittmann
Shangluo Vocational and Technical College, China

Dr. Y. James Kang
Tasly Biopharmaceutical Company, China

Dr. David John Wortley
International Society of Digital Medicine (ISDM), UK

Dr. Darwin Eton
Chief Science Officer at Vasogenesis Inc, USA

Prof. Joan-Lluis Vives Corrons
University of Barcelona, Spain

Men Vitality with Stem Cell

Deby Vinski
President of WOCS, Geneva, Switzerland

Abstract:

Stem cell therapy has shown significant potential to enhance men's vitality by addressing conditions like erectile dysfunction (ED) and hypogonadism. This comprehensive review and meta-analysis aim to evaluate the efficacy, safety, and mechanisms of stem cell therapy in improving male sexual health and vitality. The study draws from clinical trials, reviews, and preclinical studies, focusing on mesenchymal stem cells (MSCs) and their ability to regenerate tissues, improve erectile function, and boost testosterone levels. A meta analysis with random-effects models was employed to assess these outcomes alongside the anti-inflammatory properties of MSCs, which play a crucial role in tissue repair and immune modulation. The findings demonstrate that stem cell therapy significantly enhances erectile function, increases testosterone levels, and improves sperm quality. However, the study also highlights several limitations, including heterogeneity among the studies, lack of long-term data, and the absence of standardized treatment protocols. These factors limit the ability to draw definitive conclusions regarding the therapy's broader applicability. Despite these limitations, stem cell therapy holds promise as a novel approach to regenerative medicine, offering innovative solutions for men's health and vitality. Future research should focus on conducting large-scale randomized controlled trials with standardized protocols to validate the long-term efficacy and safety of stem cell therapy in treating male sexual health disorders and improving overall quality of life.

Keywords: health, stem cell therapy, treatment

Biography:

Prof. Deby Vinski is a globally recognized expert in preventive, regenerative, and anti-aging medicine, specializing in stem cell therapy, genomic medicine, and biological age reversal. She is the Founder and President of the World Council of Preventive, Regenerative and Anti-Aging Medicine (WOCPM) and Chairwoman of the Vinski Regenerative Center in Jakarta and Monaco, where advanced therapies focus on cellular regeneration, immune modulation, and disease prevention. With a PhD in Stem Cell Science and a Master's in Anti-Aging Medicine, she collaborates with international organizations such as ESAAM and holds RMCC–ASRM certification. Prof. Vinski is a frequent keynote speaker at global forums including WHO, UNESCO, and A4M, and has received multiple international awards. She is widely known for promoting ethical stem cell practices, advancing regenerative healthcare, supporting medical tourism, and mentoring future leaders in longevity science.

Quantum Physics and Cells: The Evolution of Life from Energy

Darwin Eton MD FACS DFSVS
Chief Medical and Science Officer, Vasogenesis Inc, USA

Abstract:

We now stand at the threshold of a transformative era in medicine, where cellular and molecular approaches are revolutionizing treatment of chronic diseases. To fully harness this potential, an understanding of matter at its most fundamental levelis required. The subatomic realm - where energy and mass become interchangeable according to Einstein's $E=mc^2$ - offers profound insights for biomedical innovation. But to comprehend these quantum-scale phenomena, we must begin with the fundamental physics that govern all matter. As an example, nearly 99% of our visible mass as a human being comes from the binding energy of the strong nuclear force that holds quarks together within protons and neutrons –"quantum chromodynamicsenergy". Only about 1-2% of our mass represents the intrinsic mass of fundamental particles like quarks and electrons, which themselves acquired mass through interactions with the Higgs field following electroweak symmetry breaking. In other words, our mass really is "just" energy. Where did life come from? The Physicist consensus is that Life evolved from the energy released from the "big bang" at t=0. The understanding of the first seconds after the Big Bang relies on a combination of mathematical models rooted in general relativity, quantum field theory, and particle physics.The bottom line is that the universe began as pure energy, from which we evolved. Within the first second after the Big Bang, the four fundamental forces of nature—gravity, electromagnetism, the weak nuclear force, and the strong nuclear force—became distinct. Quarks formed and combined into protons and neutrons. By 10 seconds, electrons and other leptons emerged. Between 3 to 20 minutes, the first atomic nuclei (hydrogen, helium, trace lithium) formed through Big Bang nucleosynthesis.From 3 minutes to 47,000 years after the Big Bang, photons and neutrinos dominated the universe's energy density which was also filled with the hot, dense plasma of nuclei and electrons. During the following 380,000 years of expansion and cooling, nuclei captured electrons to form stable neutral atoms, releasing the cosmic microwave background radiation we detect today.This primordial matter underwent remarkable transformations—condensing into stars and planets, ultimately leading to life through an unbroken chain of increasing complexity. The first atoms became stellar fuel, with nuclear fusion in stars forging heavier elements like carbon and oxygen, while supernovae created even heavier elements. Earth formed from this enriched material 4.6 billion years ago, where energy-driven chemistry produced life's building blocks—amino acids, sugars, and nucleotides.

The transition to life required self-replicating systems, with RNA likely serving dual roles as both genetic material and catalyst in early protocells bounded by lipid membranes. By 3.5 billion years ago, prokar-

yotic cells with DNA genomes and metabolic pathways had emerged. Cyanobacteria developed photosynthesis, eventually oxygenating Earth's atmosphere.An evolutionary leap occurred when prokaryotes formed endosymbiotic relationships—aerobic bacteria evolved into mitochondria, while photosynthetic bacteria became chloroplasts. This endosymbiosis granted eukaryotic cells unprecedented energy efficiency, enabling greater size and complexity. Multicellular life subsequently developed, featuring specialized, cooperative cells.

Each evolutionary milestone—from stellar nucleosynthesis to cellular respiration—represents energy's transformation into increasingly complex systems. Human consciousness stands as the current pinnacle of this 13.8-billion-year cosmic journey, demonstrating energy's extraordinary capacity for self-organization from quantum beginnings to biological complexity.

This is the 21st Century. Life is organized energy. We are organized energy. The time has come to understand and innovate around this.Quantum biology is a nascent field that seeks to uncover how living systems harness quantum phenomena—such as coherence, entanglement, and tunneling—to achieve remarkable efficiencies that defy classical explanation. By studying how photosynthesis achieves near-perfect energy transfer, how enzymes leverage quantum tunneling to accelerate reactions, or how birds might use quantum entanglement for navigation, this emerging field aims to bridge physics and biology. Its ultimate goal is twofold: to reveal nature's quantum tricks for optimizing life's processes, and to translate these discoveries into transformative technologies—from ultra-efficient solar cells modeled on photosynthetic complexes to quantum-inspired medicines that target diseases at the molecular level with unprecedented precision. Success could rewrite our understanding of life's fundamental mechanics while delivering breakthroughs in energy, computing, and healthcare.

Biography:

Dr. Darwin Eton is a Distinguished Fellow of the Society for Vascular Surgery and a specialist in vascular surgery and regenerative research. He earned his BSc and MSc from MIT and his MD from New York University School of Medicine. He has held senior academic roles at the University of Miami and the University of Chicago, where he led research on neovascularization for chronic ischemia. This work continued at the University of Illinois at Chicago and contributed to the Cures Within Reach Award in 2016. He is the founder of Vasogenesis Inc. in Boston, where he serves as Chief Research and Medical Officer. Dr. Eton has authored numerous peer-reviewed publications, book chapters, and textbooks in vascular surgery. He is also an invited international speaker in his field. In recent years, he has focused on the role of physics in cellular evolution.

3D Bio-Printing and Implantation of Vascular Grafts Composed of Autologous Adipose-Derived Mesenchymal Stromal Cells in Humans

Y. James Kang
Chief Scientist, Tasly Institute of Life Rejuvenation, Tianjin, China

Abstract:

We invented a 3D bio-printing technique for fabrication of human vascular grafts utilizing autologous adipose-derived mesenchymal stromal cells (AD-MSCs) as bio-ink or biosynsphere. A freshly produced AD-MSCs-based vascular graft, measuring 10 cm in length with a 5 mm inner diameter, was surgically implanted to replace a diseased vessel segment in a patient with a popliteal artery aneurysm. Computed tomography (CT) and ultrasound examinations at 3 months post-implantation revealed good maintenance of graft patency with evidence of neointima formation. Annual CT evaluations at 1 and 2 years post-implantation confirmed the sustained patency of the AD-MSCs-based vascular graft, with no abnormal hyperplasia or stenosis and a favorable recovery and normal lower limb mobility. Studies using Rhesus monkeys recaptured the observation in humans. A complete endothelium layer and smooth muscle layer were fully developed within 20 days post-implantation of the autologous AD-MSCs vascular grafts with an interposition replacement of an abdominal aorta, along with normalized collagen deposition and cross linking in the rejuvenated vasculature in all monkeys. The rejuvenated blood vessels showed normal functionality for more than 8 years. The same procedure was also conducted in miniature pigs for interposition replacement of a right iliac artery and showed the same long-term safety and efficacy. Mechanistically, the implanted AD-MSCs promoted arterial tissue rejuvenation by attracting multiple progenitor cells homing to the inner graft and differentiating into multiple functional tissue cells. This process was defined as “DEVELOR” (Destination-Engaged and Vascular Evolving-Linked Organ Rejuvenation), which is readily applicable to multiple organ rejuvenation in humans.

Biography:

Dr. Y. James Kang is a leading regenerative medicine scientist and Chief Scientist at Tasly Biopharmaceutical Company in Tianjin. He is also Professor and Director of the Regenerative Medicine Research Center at Sichuan University West China Hospital and Professor Emeritus at the University of Louisville, USA. He earned his PhD in Toxicology and Cell Biology from Iowa State University and completed postdoctoral training at Cornell University Medical Center. He has held senior academic roles at the University of North Dakota and the University of Louisville. Dr. Kang has also served on multiple U.S. federal research agencies, including NIH, USDA, EPA, and the Veterans Administration. He is a Fellow of the Academy of Toxicological Sciences and former Editor-in-Chief of Cardiovascular Toxicology.

His research focuses on mesenchymal stem cells, tissue injury signaling, and organ rejuvenation. He is known for breakthroughs in 3D bioprinting of vascular grafts for human use. His work has significantly advanced regenerative medicine and translational biomedical science.

Regenerative Medicine for Soft Tissue Injuries

Jesse Morse
Sports Medicine Physician-The Osteopathic Center, USA

Abstract:

Explores innovative approaches to healing ligament, tendon, and muscle injuries. Dr. Morse highlights Prolotherapy, a nontraditional injection technique targeting the enthesis—the area most often injured where ligaments and tendons attach to bone—to stimulate repair and strengthen soft tissue.

Drawing from over 15 personal case studies, he demonstrates how complex orthopedic and sports injuries can be effectively treated with regenerative medicine, often eliminating the need for surgery. Key focus areas include shoulder, hip, knee, lumbar, and Achilles injuries.

This presentation bridges the gap between the art and science of regenerative medicine, offering insights into optimizing patient outcomes through cutting-edge, non-surgical interventions.

Biography:

Dr. Jesse Morse is a board-certified family and sports medicine physician specializing in injuries and musculoskeletal pain. He combines traditional orthopedic care with regenerative and functional medicine to treat the root cause of issues, not just symptoms. A former team physician and athlete, he creates personalized treatment plans to heal injuries, prevent further damage, and optimize overall health. He focuses on immune health, toxin exposure, and longevity, aiming to help patients recover fully and perform at their best.

Enhanced 3D Image-Guided Minimally-Invasive Stem Cell Patching & Anchoring in Upper Cervical Ligaments & C0-1-2 Joints with Fibrin Scaffolding Matrix, Elastomeric Biomaterial Hydrogel, & Bioactive Peptides for AtlantoAxial & CranioCervical Spinal Instability

Richard J. McMurtrey
Alpine Spine & Orthopedics Institute, USA

Abstract:

Upper cervical injuries present numerous complex challenges with a broad range of neurological and orthopedic pathology and symptomatology, yet limited treatment options remain available. A novel approach to these injuries is described, where 3D image-guidance enhances targeting of these critical and delicate regions using minimally invasive techniques with unique combinations of scaffolding matrix to anchor and support concentrated stem cell patches during integration and repair. This advanced 3D imaging enables sub-millimeter confirmation accuracy for enhanced placement, outcome, and safety when patching complex pathologic targets, and the stem cell patches can be customized in various combinations of reparative orthobiologic agents, signaling factors, and viscoelasticity specific for each target to reinforce, cushion, distract, lubricate, pad, and repair ligaments, cartilage, synovial joint capsules, and connective tissue integrity. Regenerative hydrogel padding can also be placed with hydrodissection techniques around nerve roots, peripheral nerve branches, nerve plexus, and cranial nerve pathways. These composite regenerative patch constructs may include variations of stem cells, PRF or fibrin scaffolding matrix, exosomes, bioactive peptides, and biomaterial hydrogels of varying elastic moduli specific to the target tissue injury. These forms of stem cell patches with adhesive biomaterials can also be kept in liquid phase for injection or endoscopic flow, and can be loaded with concentrations of additional signaling factors that can guide tissue differentiation, remodeling, and repair. These novel approaches and technologies are described in detail specific to the unique considerations of craniocervical instabilities involving atlanto-occipital (C0-1) and atlanto-axial (C1-2) joints and ligaments.

Biography:

Dr. McMurtrey is a physician, surgeon, scientist, and biomedical engineer specializing in minimally invasive and image-guided procedures. He treats complex spine, brain, nerve, and orthopedic conditions using regenerative and precision-based approaches. He holds advanced degrees in medicine, surgery, biomedical engineering, and neuroscience. At the University of Oxford, he was recognized for pioneering stem cell–based tissue engineering. His work includes creating mini-organs and tissues using nanofiber scaffolding and 3D architecture. He integrates biomaterials and cellular signaling to enhance tissue regeneration. He has published high-impact research in stem cell biology and tissue engineering.

His innovations support minimally invasive regenerative repair techniques. His work bridges surgery, engineering, and regenerative science. He is known for advancing next-generation regenerative medicine technologies.

Gross Genomic Instability in the Ultimate Stem Cells: Human Preimplantation Embryos

Darren Griffin
University of Kent, UK

Abstract:

Human Preimplantation Genetic Testing (PGT) of embryos can be single gene,chromosomal or polygenic. It provides patients with early genetic diagnosis beforethe pregnancy has begun, thereby avoiding having a child with a genetic disorder without the need for termination. Embryo material sometimes used for stem cell studies because of its pluripotent nature. It involves pre-testing, counselling, IVF (which creates several embryos), removal of 5-10 cells from their trophectoderms (embryo biopsy) and genetic testing on the removed cell(s). This determines each embryo's genetic status, allowing transfer-of unaffectedselected embryos. PGT can be broken down into the following:

• PGT-M (for monogenic disorders) for which there have been >60,000 cycles worldwide.Universal approaches such asKaryomappingcan cut down on workup time and are being widely adopted. It includesPGT-HLA (so-called saviour siblings) and, these days, courts little controversy.
• PGT-P (for polygenic disorders) is not widely used as it is currently very controversial and is at its early stages. The controversy surrounds questions around how "pointless" or "worthwhile" this is. When we have eliminated the aneuploids and the grossly abnormal embryos how many will be left to look at polygenic risk scores, which are the staple of PGT-P diagnoses. How much will each embryo be different the next, and what mad pursuit will it be to be in a situation where we are agonizing over 55% vs 50% polygenic risk scores compared to subtle differences in morphological characteristics?
• PGT-SR (for structural chromosome rearrangements) has improved dramatically over the years and assesses all chromosomes. It is relatively non-controversial.
• PGT-A (for aneuploidy), screening IVF embryos for chromosome abnormalities is used to prevent genetically affected live birth, miscarriage and IVF failure and constitutes about 90% of all PGT cycles. About 65% of all IVF cycles in the USA use PGT-A. It remains controversial however because of concerns that it only improves live birth rate per embryo transfer, not cumulative live birth rate.

In terms of genomic stability in human embryos, evidence suggests that all human embryos are mosaic. Whole chromosome and segmental aneuploidy follow different rules in terms of parent of origin, phase of origin degree of mosaicism, etc. We should avoid transfer (or other therapeutic uses e.g. stem cells) of embryos when meiotic errors are involved. This needs close consideration if human embryonic material used to generate stem cells.

Biography:

Dr. Darren Griffin received his BSc and DSc from the University of Manchester and his PhD from University College London. A renowned expert in cytogenetics, he served as Professor of Genetics for over 20 years and currently holds honorary positions at UCL and Kasetsart University. He is internationally recognized for pioneering cytogenetic preimplantation genetic diagnosis and contributing to the development of Karyomapping for IVF embryo testing. With around 450 scientific publications, he is also known for his work on dinosaur genomes, science communication, and interdisciplinary research. He has supervised nearly 50 PhD scholars and frequently appears in media and television programs.

Lumbar Facet Regeneration for Chronic Pain

Omid Liaghati
The College of Family Physicians of Canada, Canada

George Lantz
Director of New Services, Pain Care Clinics, Canada

Abstract:

Chronic low back pain (CLBP) remains a leading cause of disability worldwide, with lumbar facet (zygapophyseal) joints implicated in a substantial proportion of cases. Despite their prevalence, facet-mediated pain is frequently underdiagnosed due to overlapping clinical features with other lumbar pain generators and the absence of definitive imaging correlates. Conventional management—including pharmacologic therapy, physical rehabilitation, intra-articular corticosteroid injections, and radiofrequency ablation—often provides only short-term or inconsistent relief and may carry cumulative risks when repeated. These limitations have contributed to growing interest in regenerative medicine approaches that aim to address underlying joint pathology rather than modulate symptoms alone.

This presentation reviews the anatomical, biomechanical, and clinical foundations of lumbar facet joint pain, emphasizing characteristic referral patterns, mechanical aggravating factors, and diagnostic challenges. The role of image-guided diagnostic blocks is highlighted as a critical component of patient selection, enabling confirmation of facet-mediated pain and informing interventional decision-making. Current evidence supporting regenerative strategies—particularly platelet-rich plasma (PRP)—is examined in comparison with traditional injectates such as local anesthetics and corticosteroids.

Emerging prospective and randomized studies indicate that while corticosteroids may offer superior short-term analgesia, PRP provides more durable improvements in pain and function at mid- to long-term follow-up, extending six to twelve months in appropriately selected patients. These findings support the hypothesis that PRP's biologic effects—including modulation of inflammation and promotion of tissue repair—may confer sustained benefit beyond that of purely anti-inflammatory or anesthetic interventions.

A detailed clinical case is presented involving a young adult with long-standing, refractory lumbar facet and sacroiliac joint pain unresponsive to multiple conservative and interventional treatments. Following ultrasound-guided PRP injections to the lumbar facet joints, the patient experienced substantial and sustained pain reduction, improved mobility, and return to functional activity with minimal post-procedural discomfort. Follow-up demonstrated durable resolution of facet-related symptoms, underscoring the clinical relevance of regenerative approaches in carefully selected patients.

In conclusion, regenerative strategies such as PRP represent a promising adjunct or alternative to conventional treatments for chronic lumbar facet joint pain. When integrated into a structured diagnostic and therapeutic algorithm, these biologic therapies may offer meaningful, longer-term outcomes with a favorable safety profile. Continued high-quality research is needed to refine patient selection, optimize treatment protocols, and clarify long-term efficacy.

Biography of Omid Liaghati:

Dr. Omid Liaghati, MD, CCFP, CAPM is a licensed Canadian family physician specializing in chronic pain management. He combines medication and interventional techniques in his practice, including nerve blocks, chemical nerve ablation, PRP therapy, stem cell therapy, and phototherapy to provide comprehensive care for patients with persistent pain.

Biography of George Lantz:

Dr. George Lantz is a Harvard-trained anesthesiologist and pain management specialist with over 25 years of experience. He specializes in interventional treatments for acute, chronic, and cancer-related pain. He holds additional MBA and MGM qualifications. His work focuses on restoring function and improving quality of life through conventional and regenerative therapies. He uses a multidisciplinary approach to complex pain conditions. He has practiced in military, private, and academic settings. His experience spans both the United States and international practice. He is recognized nationally for expertise in pain medicine. He is also involved in teaching, leadership, and medical education. His work emphasizes innovative and patient-centered pain management strategies.

From Personal Motivation to Responsible Translation: Bridging Biologic Physiology and Clinical Implementation in Regenerative Medicine

Brooke Morrisseau
MS & Founder CEO, Cellovian Scientific, USA

Abstract:

Advances in tissue engineering and regenerative biologics have accelerated rapidly over the past decade, yet challenges in clinical translation persist. This keynote examines how a personal entry point into regenerative medicine evolved into a broader exploration of biologic physiology, tissue architecture, and the practical realities of clinical implementation.

Grounded in core principles of tissue engineering—cell signaling, extracellular matrix dynamics, and biologic preservation—this presentation explores why many translational failures arise not from inadequate innovation, but from insufficient alignment between scientific understanding and clinical education. Particular emphasis is placed on how engineered biologic materials are interpreted and communicated once they leave the laboratory environment and enter real-world clinical settings.

Rather than focusing on specific therapeutic claims or outcomes, the talk highlights the importance of education-driven implementation, manufacturing transparency, preservation chemistry considerations, and ethically sound communication frameworks as critical components of responsible translation. These elements are increasingly essential for protecting patients, clinicians, and the integrity of the science as regenerative technologies move toward broader adoption.

This keynote concludes with a perspective on the future of tissue engineering that emphasizes cross-disciplinary collaboration between researchers, educators, and clinicians—recognizing that sustainable progress in regenerative medicine depends not only on what can be engineered, but on how knowledge is transferred, contextualized, and responsibly applied in clinical practice.

Biography:

Ms. Brooke Morrisseau is CEO of Cellovian Scientific and an educator in regenerative medicine and biologics. She focuses on translating cell physiology, biologic structure, and tissue engineering into practical, ethical clinical applications, helping clinicians make informed decisions.She has worked as a scientist at SUNY Oswego and Keuka College, specializing in biologics and protein purification, and has taught physiology and metabolism at the University of South Florida. Her work emphasizes education-first approaches, transparency, and responsible implementation in regenerative medicine.

Exploring the Ethics of Creating Chimeric 'Monkey–Human' Embryos

Francis O'Keeffe
University of Notre Dame Australia, Australia

Abstract:

Induced human extended pluripotent stem cells (hEPSC) have been injected into monkey blastocysts to create chimeric embryos. Chimera research is a scientific technique which seeks to develop human organs for transplantation, but it has raised concerns regarding human cells contributing to the brain formation of nonhuman animals. This article considered whether brain development should guide ethical considerations on chimera research by investigating the morality of terminating live anencephalic infants to procure their organs. It found that identifying the presence or absence of a human biological developmental programme helps to determine the correct ethics of chimera research, and that experimentation with this programme should be prohibited. However, the formation of chimeric embryos with induced hEPSC does not experiment with a human biological developmental programme. This determination was made after investigating the developmental potential of synthetic embryos created with induced pluripotent stem cells. Based upon these findings, this article cautiously recommends that chimera research only be permitted to continue with induced hEPSC.

Biography:

Mr. Francis O'Keeffe is an Associate Lecturer at the University of Notre Dame Australia (Sydney) and a PhD candidate in bioethics. He studies the ethical status of the human embryo, with a focus on early developmental processes. His research covers twinning, individuation, and the origins of identical twins. He is known for challenging the view that embryo splitting can occur up to day 14 of development. He also disputes the idea that two embryos can fuse into one viable organism. From this, he proposes alternative explanations for human chimerism. His work critiques laws permitting early-stage embryo research. He holds a Master of Bioethics and a Bachelor of Laws from La Trobe University. His research integrates bioethics, law, and developmental biology. He contributes to academic and policy discussions on embryo research ethics.

Quality Standards in Stem Cell Biobanks

Latifa Hassan Gaddah
University of Sousse, Tunisia

Abstract:

Stem cell biobanking represents a critical interface between basic research, translational medicine, and advanced therapeutic applications. Ensuring the quality, safety, and reproducibility of pluripotent stem cell (PSC) products requires a comprehensive and integrated standardization framework spanning the entire biobanking lifecycle. This presentation examines current quality standards in stem cell biobanking, highlighting the interplay between process management, analytical methodologies, and product acceptance criteria.

A central focus is placed on Critical Quality Attributes (CQAs), including cell viability, identity verification, sterility, genomic stability, and pluripotency. The limitations of current assessment tools such as variability in pluripotency markers and incomplete detection of genomic abnormalities underscore the need for multi-modal, risk-based evaluation strategies. Particular attention is given to genomic integrity monitoring through combined approaches (karyotyping, SNP arrays, and next-generation sequencing), as well as the impact of passage number on genetic drift and cellular fitness.

The presentation further explores the role of Good Manufacturing Practices (GMP) in standardizing cell processing, alongside validated analytical methods that ensure accuracy, sensitivity, and reproducibility. Ethical considerations, including informed consent, donor eligibility, and data governance, are emphasized as integral components of quality systems rather than external constraints. In parallel, the importance of end-to-end traceability linking donor data, manufacturing processes, materials, and distribution is addressed as a cornerstone for regulatory compliance and scientific reliability.

A key challenge identified is the fragmentation of international guidelines, with multiple national and organizational frameworks lacking harmonization across the global biobanking ecosystem. This variability limits interoperability, comparability of results, and large-scale collaboration. Consequently, the need for a convergent, risk-based quality management approach aligned with international standards is highlighted.

In conclusion, stem cell biobanking must evolve from fragmented compliance models toward integrated, system-level quality infrastructures. Such transformation is essential to support robust clinical translation, ensure patient safety, and enable reproducible, high-impact scientific outcomes in regenerative medicine.

Biography:

Dr. Latifa Gaddah is an immunopathologist and biotherapies specialist with expertise in immunogenetics, stem cell processing, and cellular therapy quality systems. She holds advanced degrees in genetics, biotherapies, and medicine, and is an international fellow of the College of American Pathologists. She serves as a CAP Inspector Team Leader, AABB assessor, and Assistant Professor at the University of Medicine Sousse, Tunisia. As founder of YLM Training & Consultancy, she focuses on education and capacity building across the MENA region, promoting precision immunology, high-quality standards, and safe, innovative clinical practices.

Exploring Sesquiterpene Lactones as Novel Candidates for Skin Cancer Treatment: An In Vitro Study in Human Mesenchymal Stem Cells

Juliana Leal Rodrigues da Costa
Federal University of Juiz de Fora, Brazil

Abstract:

Conventional antitumor therapies exhibit low selectivity, affecting not only tumor cells but also healthy cells, including mesenchymal stem cells (MSCs), which play a critical role in tissue regeneration and homeostasis. This limitation is particularly relevant in melanoma, an aggressive form of skin cancer characterized by rapid progression and high metastatic potential. Current therapeutic strategies are associated with increased oxidative stress and damage to DNA, proteins, and lipids, ultimately compromising the regenerative capacity of normal tissues. Therefore, the development of more selective and less toxic antitumor agents remains an urgent challenge.

Natural compounds have emerged as promising alternatives in anticancer drug discovery, including sesquiterpene lactones isolated from medicinal plants, which have previously demonstrated antitumor activity, including against melanoma cells. However, their effects on human stem cells remain poorly understood, particularly regarding their potential impact on essential cellular functions such as viability and differentiation.

The present study aimed to evaluate the effects of sesquiterpene lactones on human adipose-derived mesenchymal stem cells (hASCs), focusing on cytotoxicity and osteogenic differentiation potential, in comparison with the reference chemotherapeutic agent 5-fluorouracil (5-FU). hASCs were isolated from human lipoaspirates according to the protocol described by Zuk et al. (2001), under ethical approval and informed consent. Cells were cultured in DMEM supplemented with fetal bovine serum at 37 °C and 5% CO□ atmosphere. Cytotoxicity was assessed using the MTT assay, and osteogenic differentiation was evaluated over a 28-day period in osteogenic medium, with mineralization confirmed by von Kossa staining. The concentrations applied in differentiation assays were determined based on IC□□ values obtained from the MTT assay.

Isolation and expansion of hASCs were successful, with an initially heterogeneous population gradually evolving into predominantly adherent, spindle-shaped cells. In viability assays, hASCs treated with sesquiterpene lactones and 5-FU were able to metabolize MTT at all tested concentrations, indicating preserved metabolic activity. Osteogenic differentiation was confirmed by the presence of mineralized matrix in cells treated with sesquiterpene lactones, as evidenced by positive von Kossa staining. In

contrast, cells exposed to 5-FU exhibited reduced staining intensity, suggesting an inhibitory effect on osteogenic differentiation. These findings indicate that sesquiterpene lactones exert cytotoxic effects while more effectively preserving essential stem cell functions when compared with the conventional chemotherapeutic agent 5-FU.

In conclusion, sesquiterpene lactones demonstrated potential as prototype antitumor compounds with reduced impairment of osteogenic differentiation relative to 5-FU. These results support their relevance as promising candidates for the development of more selective and less toxic therapeutic strategies for skin cancer. Further studies are currently underway to deepen the understanding of their biological effects and to strengthen their potential application as safer antitumor agents. This study was supported by FAPEMIG (RED00213-23-FAPEMIG). The authors declare no conflict of interest.

Keywords:
Skin cancer; Sesquiterpene lactones; Mesenchymal stem cells; Antitumor activity; Cytotoxicity

Biography:

Mrs. Juliana Leal Rodrigues da Costa is a Brazilian pharmacist, graduated from the Federal University of Juiz de Fora (UFJF), and currently a Master's student in Pharmaceutical Sciences. She completed an academic exchange at Universität Rostock, Germany, where she was involved in research activities related to stem cell biology. Her current research focuses on the investigation of bioactive compounds and their effects on stem cells and cancer-related cellular models, aiming to better understand cellular responses, mechanisms of action, and potential therapeutic applications in oncology.

Investigating the Expression of Ascl1 in Human Bone Marrow Mesenchymal Cells and their Differentiation towards Pancreatic Beta Cells

Mina Shajarizadeh
Tehran University of Medical Sciences, Iran

Abstract:

Introduction:

Mesenchymal stem cells (MSCs) possess the capacity to differentiate into multiple cell lineages, including insulin-producing pancreatic cells. Genetic modification using transcription factors such as Ascl1 and Pdx1 may enhance the differentiation potential of MSCs toward a □-cell phenotype, offering promising therapeutic approaches for diabetes mellitus.

Material and Method:

Human and mouse MSCs were isolated and characterized by flow cytometry for specific surface markers (CD73, CD90, CD105). The Ascl1 gene was cloned into the LeGO-GFP vector, and MSCs were transfected with Ascl1 and Pdx1. Gene expression was analyzed by RT-qPCR to evaluate the efficiency of transfection and differentiation.

Result:

Flow cytometry confirmed MSC phenotype. Successful cloning and transfection of Ascl1 and Pdx1 were verified by GFP expression and PCR. RT-qPCR results showed significant upregulation of Ascl1, Pdx1, and pancreatic differentiation markers in transfected cells, indicating enhanced insulin-producing cell differentiation.

Conclusion:

The study demonstrated that co-transfection of Ascl1 and Pdx1 effectively promotes MSC differentiation into insulin-producing cells. These findings support the potential use of genetically modified MSCs in regenerative therapies for diabetes mellitus, although further studies are required to optimize protocols for clinical application.

Keywords:

Mesenchymal stem cells, Insulin-producing cells, Ascl1, Pdx1, Gene transfection, Diabetes therapy.

Biography:

Mrs. Mina Shajarizadeh is a PhD student in Molecular Medicine at Tehran University of Medical Sciences with over 11 years of laboratory and research experience in cellular and molecular biology, biochemistry, and microbiology, including quality control in clinical labs. She holds a Master's degree in Medical Parasitology and a Bachelor's in Laboratory Sciences. Her research focuses on stem cell biology, gene expression, and cellular differentiation in regenerative medicine and cell therapy, with projects exploring mesenchymal stem cells, pancreatic beta cell differentiation, and exosome effects on insulin signaling.

Progenitor Cell Mobilization and Induced Neutrophilia Promote Neovascularization and Fibrinolysis in Chronically Ischemic Tissue

Darwin Eton MD FACS DFSVS
Chief Medical and Science Officer, Vasogenesis Inc, USA

Abstract:

Keywords: Neutrophilia, Neutrophil,Angiogenesis, Arteriogenesis, Filgrastim, Neupogen, Granulocyte-Colony Stimulating Factor, G-CSF, fibrinolysis, thrombosis, Nitric oxide synthase, neovascularization, plasmin, Hepatocyte Growth Factor, VEGF, ArtAssist Device, Ischemia, Vascular Disease, VEGF-165B, MMP-9, Hematopoietic Stem and Progenitor Cell, Endothelial progenitor cell, Hematopoietic Stem Cell, Hematopoietic progenitor cell

Funding Statement: The study was supported by Warren H. and Clara Cole Foundation; Cures Within Reach; Department of Surgery University of Illinois-Chicago; Department of Surgery University of Chicago

Ethical Compliance: Patients were not involved in this literature review. However, reference is made to human data obtained in accordance with the 1964 Helsinki Declaration and its later amendments (Trial registration: https://clinicaltrials.gov/ct2/show/NCT02802852).

Data Access Statement: The data that support the findings of this study are openly available in the DRYAD repository at https://doi.org/10.5061/dryad.b2rbnzsgw and in DOI: 10.1002/term.3284

Biography:

Dr. Darwin Eton is a Distinguished Fellow of the Society for Vascular Surgery and a specialist in vascular surgery and regenerative research. He earned his BSc and MSc from MIT and his MD from New York University School of Medicine. He has held senior academic roles at the University of Miami and the University of Chicago, where he led research on neovascularization for chronic ischemia. This work continued at the University of Illinois at Chicago and contributed to the Cures Within Reach Award in 2016. He is the founder of Vasogenesis Inc. in Boston, where he serves as Chief Research and Medical Officer. Dr. Eton has authored numerous peer-reviewed publications, book chapters, and textbooks in vascular surgery. He is also an invited international speaker in his field. In recent years, he has focused on the role of physics in cellular evolution.

Comparative Transcriptomic of Primary Adenoid Cystic Carcinoma and Matched Derived Cell Lines Reveal Dominance of Myoepithelial/Mesenchymal Lineage and Inter-Lines Genomic Heterogeneity: Utilization and Biological Implications

Adel K. El-Naggar
University of Texas, USA

Abstract:

Adenoid cystic carcinoma (ACC), a common salivary gland malignancy, is characterized by cellular and morphologic features and pursue aggressive clinical behavior. Recent molecular genetic studies have identified chromosomal translocation and genomic characteristics that may be linked to their phenotypic and clinical manifestations. Efforts to investigate ACC response to targeted therapy, however, have been hindered by the lack of faithful transgenic mouse mode and cell lines to investigate key biological and lineage pathways. We've developed several cell lines and retained fresh frozen primary tumor specimens and conducted comparative transcriptomic of matched pair of tumor and derived cell lines. The findings and the potential utilization of ACC cell lines for biological and therapeutic investigations will be presented.

Biography:

Dr. El-Naggar is a senior subspecialized Head and Neck pathologist with interest centered on classification, diagnosis, and research of salivary gland, mucosal, and thyroid neoplasms. He has led the Editorial Board of the World Health Organization (WHO) Head and Neck Tumor Classification reference text and the recipient of the Henry Rothchild Scholarship of the Institute Curie, Paris, France and member of the Guttenberg Science Academy. Dr. El-Naggar is a member of several editorial board of National and International Journals and has authored and co-authored numerous publications in Head and Neck Pathology and Molecular Pathology fields.

DNA Damage and Oxidative Stress in Spermatozoa: Its Role in Fertility and General Health Screening

Darren Griffin
University of Kent, UK

Abstract:

A good human sperm has 23 chromosomes including an X or a Y, undamaged, non-fragmented DNA, appropriate balance of protamines and histones, good mitochondrial function, a functional acrosome for fertilization, normal morphology and defined chromatin packaging/organization. A bad human sperm, on the other hand, may have damaged/fragmented DNA, poorly defined chromosomal organization/packaging, inappropriate balance of protamines and histones, poor mitochondrial function, a dysfunctional acrosome, abnormal morphology and/or sperm aneuploidy e.g. an X and a Y chromosome. Male factor infertility is a globally under-recognized public health issue. Infertility affects15-20% of couples trying to conceive; ~50% of all infertility is male factor with 40-50% idiopathicand>7% of all men affected. Standard semen analysis is currently inadequate, subjective and poorly standardizedas we do not know which characteristics really distinguish fertile and infertile men. Indeed 15% of infertile men have normal semen parameters. Male factor infertility is on the increase with rising sperm aneuploidy levels, poorer chromatin packaging, higher levels of reactive oxygen species and sperm DNA fragmentation. Sperm DNA damage can be defined as any chemical change in the normal structure of the DNA and is one of the most common form of male infertility. multiple meta-analyses indicate it may affect embryo development, implantation and pregnancies in both natural and assisted reproduction. The following factors are associated with DNA fragmentation: Sperm aneuploidy, improper DNA packaging, abortive apoptosis, oxidative stress, health conditions such as diabetes, varicocele, infection, and cancer, lifestyle factors such as smoking, weight, drinking, drug use, and abstinence, plus age and chemical exposure (e.g. to endocrine disruptors and microplastics). Altered DNA fragmentation is, in turn, associated with reduced fertilization rates, lowerblastulation rates, reduced implantation, lower pregnancy rate, lower live birth rates, altered obstetric outcomes and aneuploidy (paternal and maternally derived) in embryos. Indeed, DNAfragmentation is a much improved predictor of fertilization rates and live birth outcomes than semen analysis alone. It is the contention of this presentation that all roads lead to the need for an effective DNA fragmentation screening service. Once high levels of DNA fragmentation are established, then patients have a number of options after referral to a urologist. These can include sperm separation/selection or anti-oxidant treatment. There are many ways in which we can, potentially, improve DNAfragmentation levels and lower reactive oxidative species. If varicocele is present, then varicocelectomy. Patients could stop smoking, reduce drinking, recreational drug use etc. They couldimprovetheir diet and lifestyle or use bespoke products with some clinical evidence. So long as a

“treatment” is demonstrably non (or minimally) harmful and where clearly indicated, it may be worth a try because everyone is different Sperm separation devices can be measured to establish if they reduce DNA fragmentation levels and (placebo controlled) randomised controlled trials may only be part of the picture (if they are ever funded). Results (e.g. retrospective) from single centres or single individuals may be just as useful to patients when meta-analyses may mask patient-specific effects and benefits. All treatments will, however,only work properly if accompanied by a robust, DNAfragmentation screening service.

Biography:

Dr. Darren Griffin received his BSc and DSc from the University of Manchester and his PhD from University College London. A renowned expert in cytogenetics, he served as Professor of Genetics for over 20 years and currently holds honorary positions at UCL and Kasetsart University. He is internationally recognized for pioneering cytogenetic preimplantation genetic diagnosis and contributing to the development of Karyomapping for IVF embryo testing. With around 450 scientific publications, he is also known for his work on dinosaur genomes, science communication, and interdisciplinary research. He has supervised nearly 50 PhD scholars and frequently appears in media and television programs.

Significance of CD34 and CD105 Marker Research in Tumor Metastasis

Vladimir Jurisic
University of Kragujevac, Serbia

Abstract:

The CD34 molecule is used as a marker of hematopoiesis because it is mainly represented on stem cells with a high differentiation potential, but it is also found on the endothelium of lymphatic and blood vessels as well as on fibroblasts. Recently, its role in metastasizing has been extensively investigated in various types of tumors. In addition, CD105 (human endoglin) is a newer marker of blood vessel proliferation because it is expressed on the endothelium. In the occurrence of metastases of various types of tumors, it has also been investigated recently because it is up-regulated under hypoxic conditions and increased with the TGF-b receptor signaling pathway. Bearing in mind the importance of neovascularization in the process of metastasizing, here we examined the importance of the mentioned two markers; CD34 and CD105 for the development of lymph node metastases in NSCLC lung tumors as well as in colorectal cancer by immunohistochemistry. Each of the markers showed its own specificity and characteristics. The results showed a dependence these markers on the tumor grade, TNM classification and lymph node involvement. The strength of expression of the CD34 molecule was more expressed compared to CD105 based on the intensity of staining, but the CD105 marker shows a better prognosis. The findings indicate that it is always necessary to examine several markers in order to obtain a clearer picture and better insight into the problems of metastasis and connection with individual signaling pathways. This is necessary for the application of appropriate therapy based on blocking disturbed signaling pathways and individualization of therapy.

Biography:

Dr. Vladimir Jurisic is a physician and researcher specializing in internal medicine, hematology, and oncology. He studied and trained at the University of Belgrade, with additional fellowships and education at institutions in Berlin, Athens, and Milan. His research focuses on molecular and cellular mechanisms in cancer, including TNF-alpha effects on lymphoma cells. Dr. Jurisic has authored over 240 scientific publications, contributed to multiple books, and delivered numerous international lectures. He has received several national and international awards and grants for his contributions to medical science.

New-Generation Ektacytometry Study of Red Blood Cells in Hereditary Hemolytic Anemias

Joan-Lluis Vives Corrons
Josep Carreras Leukaemia Research Institute (IJC), Badalona, Barcelona, Spain

Abstract:

Next-generation ektacytometry, as provided by the osmoscan module of the Laser Optical Rotational Red Cell Analyser (LoRRca) MaxSis, is currently one of the most advanced complementary diagnostic tools for congenital rare anemias associated with red blood cell (RBC) defects. Osmotic gradient ektacytometry (OGE) is considered the gold standard for diagnosing RBC membrane disorders, particularly hereditary spherocytosis (HS). A hallmark of hereditary hemolytic anemias is impaired RBC deformability, which leads to reduced cell survival and is generally attributed to abnormal cell shape, increased rigidity, or dehydration.

To date, next generation ektacytometry has been primarily employed for the differential diagnosis of RBC membranopathies, while its application in structural hemoglobinopathies and thalassemia remains limited. However, with the recent development of novel therapeutic strategies for hemoglobinopathies, particularly sickle cell disease and □-thalassemia, there is growing clinical interest in ektacytometry, warranting further exploration.

In this study, we evaluated the OGE profiles obtained using the osmoscan module of the LoRRca ektacytometer in 96 patients with different hemoglobinopathies, including both structural variants and thalassemia. Our objective was to assess the utility of OGE for the early diagnosis of these disorders, either in isolation or in co-inheritance with other hereditary RBC defects. Furthermore, we aimed to enhance our understanding of the contributions of RBC deformability, osmotic fragility, and intracellular viscosity to the pathophysiology of hemolysis, particularly in the context of rare anemias.

Our findings indicate that the osmoscan profile provides valuable complementary insights into RBC deformability and hydration homeostasis, which may improve our understanding of the mechanisms underlying reduced RBC survival and hemolysis in affected patients.

Biography:

Dr. Joan-Lluis Vives-Corrons is Emeritus Professor of Hematology at the University of Barcelona and Honorary Researcher at the Josep Carreras Leukaemia Research Institute. His work focuses on heredi-

tary hemolytic anemias, including membranopathies, enzymopathies, and hemoglobinopathies. He has led major international initiatives such as ENERCA and currently chairs the Scientific Board of the Rare Anemias International Network (RAIN). With over 300 scientific publications, he has contributed significantly to rare hematology research and the development of European networks like ERN-EuroBlood-Net.

In Silico Modeling Human Embryonic Metabolism: A Systems Biology Approach to Reconstructing Developmental Networks

Andisheh Dadashi
The University of New Mexico, USA

Derek Martinez
The University of New Mexico, USA

Abstract:

Understanding human embryo metabolism during the peri-implantation period is crucial for advancing regenerative medicine, yet direct experimentation remains ethically and technically constrained. In this study, we present a novel in silico framework that models stage-specific metabolism of human embryos from Days 6 to 14 using single-cell RNA-seq data and genome-scale metabolic modeling. By integrating gene expression with flux balance-based network expansion, we reconstructed multi-compartmental metabolic networks that capture dynamic biochemical changes across development. The model accurately predicts amino acid utilization, oxygen-dependent lactate transport, and responses to ammonium stress—findings that align with known experimental data. This computational approach not only offers mechanistic insights into early human development but also provides a valuable tool for optimizing stem cell culture conditions and guiding regenerative strategies. Our work highlights the power of systems biology in bridging embryology, metabolism, and translational stem cell research.

Biography of Andisheh Dadashi:

Dr. Andisheh Dadashi is a computational biologist, statistician, and assistant professor at the University of New Mexico–Valencia, USA. With advanced degrees in statistics and computer science, her work bridges mathematics, computing, and molecular biology. Her research focuses on high-performance computing and systems biology, including the development of stage-specific in silico models of human embryo metabolism. This work has provided new insights into metabolic regulation and early development, with applications in regenerative medicine and stem cell research. Dr. Dadashi has received international recognition, including awards at global conferences, and is also a dedicated educator known for her interdisciplinary teaching and contributions to student learning.

Biography of Derek Martinez:

Dr. Derek Martinez is a Biology lecturer at the University of New Mexico–Los Alamos Campus with an M.S. in Biomedical Engineering. He teaches courses in anatomy, physiology, biology for health sciences, and organic chemistry. His research interests include cancer biology, metabolism, gene therapy, and induced pluripotent stem cells. He was recognized as a ROSE Scholar for work on nanoparticle-based

drug delivery systems. He also develops interactive, evidence-based digital tools to improve biology education and student learning outcomes.

Ribosomal Affinity Confers Post-Transcriptional Significance to the Stem Cell Factor and Oncogene SOX2

Thorsten Schaefer
University of Basel, Switzerland

Abstract:

SOX2 (SRY Homology Box 2) is a pluripotency-inducing transcription factor essential for the maintenance of embryonic, fetal, and adult stem cells. Dysregulation, by contrast, renders SOX2 a devastating oncogene associated with transformation, therapy resistance, and disease relapse in primarily neuroectodermal cancers. Until recently, these ambivalent roles in health and disease were attributed exclusively to SOX2-induced changes in gene regulation. However, SOX2's access to DNA is strictly controlled (see Schaefer and Lengerke, Oncogene 2020, for an invited review), and in some cell types, such as trophoblasts, SOX2 is predominantly cytoplasmic. This suggests a hitherto unrecognized, presumably extranuclear affinity of SOX2.

Based on these considerations, we recently reported a new functional significance of cytoplasmic SOX2, arising from protein elements that lack DNA-binding capacity. Rather, we identified SOX2 in association with ribosomes, where it influences the translation of factors involved in morphogenesis and differentiation (see Schaefer et al., Cell Reports 2024). This suggests a bifunctional mechanism of SOX2 action, where nuclear SOX2 binds DNA to promote stem cell properties at the transcriptional level, while cytoplasmic SOX2 interacts with ribosomes to regulate cell differentiation at the translational level. This discovery raises several relevant follow-up questions that are the focus of our current investigations: In what spatio-temporal context do SOX2 and ribosome encounter each other? Where is SOX2's docking site on the ribosome, and is it suitable for pharmacological targeting applications? And finally, are there SOX2 affinity 'stemness ribosomes', and could these represent targets for stem cell-selective interventions?

Taken together, our findings redefine SOX2 as a dual-specificity factor that controls cell fate via both transcriptional and translational events. A deeper understanding of the underlying mechanisms may open up new therapeutic strategies for this currently 'undruggable' target, with potentially far-reaching implications for reproductive, regenerative, and cancer medicine.

Biography:

Dr. Schaefer is a senior researcher and lecturer at the University and University Hospital in Basel, Switzerland. A biochemist by training, he specializes in the PI3K/AKT signaling path way and the mo-

lecular-functional regulation of the stem cell factor SOX2.With more than 20 years of professional experience in academia and industry, Dr. Schaefer is a standing member of the German Society for Hematology and Medical Oncology (DGHO), the American Association of Cancer Research (AACR), the American Chemical Society (ACS), and the Biochemical Society, London. The work presented was funded by Swiss Cancer Research (KFS-4852082019R) and the Swiss National Science Foundation (SNSF-10.004.128). Dr. Schaefer declares no conflicts of interest. Additional information is available at ORCID 0000-0003-4867-8374.

AI in Clinical Trials: Translating Scientific Innovation into Compliant Global Pathways for Stem Cell and Regenerative Medicine

Cynthia N. Brysch
Devine Guidance International, Inc., USA

Abstract:

The transformative potential of stem cell and regenerative medicine is reshaping modern therapeutics; however, the translation from scientific discovery to clinical and commercial success remains constrained by regulatory complexity, data integrity requirements, and fragmented global frameworks. Artificial Intelligence (AI) offers a powerful mechanism to accelerate this transition—yet its implementation within GxP-regulated environments demands a disciplined approach to validation, traceability, and regulatory acceptance.

This presentation introduces an advanced science-to-compliance continuum, a structured, risk-based framework that operationalizes innovation across exploratory, non-clinical, clinical, and manufacturing phases of advanced therapy development. Drawing on over 20 years of experience and leadership across more than 500 product campaigns—including rare diseases, cell and gene therapies, and first-in-class CRISPR-Cas9 applications—Dr. Cynthia N. Brysch demonstrates how AI can be integrated into clinical trials while maintaining data integrity, patient safety, and inspection readiness.

Leveraging her experience as an FDA Lead Assessor, ICH committee member, and ISO accrediting authority, Dr. Brysch provides a global perspective on aligning AI-enabled methodologies with evolving regulatory expectations. The session highlights practical applications of AI in protocol optimization, patient stratification, real-time monitoring, and predictive analytics—anchored within GxP/ICH standards and tailored to Advanced Therapy Medicinal Product (ATMP) pathways under EMA, alongside FDA and global harmonization frameworks.

Attendees will gain insight into implementing phase-appropriate, risk-based compliance strategies that enable least burdensome pathways to safety and efficacy, while maintaining full traceability and audit readiness. Emphasis is also placed on integrating quality systems, supply chain oversight, and cross-functional governance to support scalable, commercially viable programs.

Ultimately, this session reframes AI as a disciplined enabler of compliant innovation—bridging the gap between scientific advancement and regulatory execution to accelerate the global delivery of safe, effective, and transformative regenerative therapies.

Key Words:
Artificial Intelligence; Stem Cell Therapy; Regenerative Medicine; ATMP; Clinical Trials; GxP; Data Integrity; Regulatory Strategy; EMA; FDA; ICH; Translational Science

Biography:

Dr. Cynthia N. Brysch is an award-winning life sciences executive and global consultant specializing in regulatory affairs and quality assurance. She is certified in QA/RA and has extensive experience with international compliance frameworks such as GxP, ICH, ISO 13485/9001, and FDA regulations. With over two decades of leadership in the pharmaceutical and biotech industries, she has overseen more than 500 product development programs, including rare diseases and advanced therapies like cell, gene, and CRISPR-based treatments. Dr. Brysch is recognized as a key opinion leader in regulatory strategy, helping companies navigate product development from early research through global commercialization.

Breaking the Silence of the Solid Tumor Microenvironment: The Convergence of Epigenetic Remodeling and CIML-NK Cell Plasticity

Mohammadali Zolfaghari
American Board of Regenerative Medicine, Iran

Abstract:

The Challenge of Solid Malignancies

Despite the success of immunotherapy in hematological cancers, the landscape of solid tumors remains characterized by a hostile, immunosuppressive microenvironment (TME). Factors such as TGF-β signaling, hypoxia, and epigenetic silencing often render conventional Natural Killer (NK) cell therapies ineffective, leading to rapid exhaustion and limited tumor infiltration.

The Conceptual Framework: A Triple-Hit Synergy

This presentation explores a multi-dimensional strategy to bridge the gap between innate immunity and clinical efficacy in solid tumors, specifically focusing on HER2-positive breast cancer.

• Harnessing Innate Memory: Cytokine-induced memory-like (CIML) NK cells, primed with IL-12/15/18, demonstrate superior longevity, robust IFN-γ production, and enhanced metabolic fitness, providing a resilient effector population against the TME.
• Epigenetic Sensitization: The strategic use of Histone Deacetylase inhibitors (HDACi), such as Vorinostat, can act as a molecular "primer," upregulating NK-activating ligands (MICA/B) and reversing the "cold" phenotype of solid tumors.
• Targeted ADCC Amplification: By integrating monoclonal antibodies like Trastuzumab, the CIML-NK platform can be directed with high precision, maximizing Antibody-Dependent Cellular Cytotoxicity (ADCC) even under suppressive conditions.

Translational Implementation

Reflecting this innovative framework, our ongoing research at the Molecular Immunology Research Center focuses on a "Triple-Hit" in vitro model. This project integrates the functional memory of human NK cells with epigenetic priming to evaluate synergistic eradication of HER2+ breast cancer cells. Early evidence underscores that the convergence of HDAC inhibition and cytokine-induced differentiation may represent a new frontier in bypassing tumor resistance.

Biography:

Dr. Mohammadali Zolfaghari is a PhD in Molecular Medicine and a Diplomate & Alpha Affiliated member

of the American Board of Regenerative Medicine (ABRM). He serves as the Research and Development Manager at the Molecular Immunology Research Center, Tehran University of Medical Sciences, and represents Celltech Pharmed Company as its exclusive sales representative. His expertise lies in regenerative medicine, immunotherapy, and precision medicine, with a focus on translating laboratory discoveries into clinical applications. He is dedicated to developing innovative, patient-centered therapeutic strategies and fostering collaborations that advance healthcare through cutting-edge biomedical research.

What if Aging was Optional

Hany Demian
CEO, Praesentia Healthcare LLC, USA

Abstract:

For centuries, we've accepted aging as an unstoppable decline. But breakthroughs in stem cell therapy, regenerative medicine, and genomics are challenging one of humanity's oldest assumptions.

Today, scientists can reprogram cells, reboot damaged tissues, and even rewrite genetic instructions tied to aging. We're no longer just adding years to life, we're beginning to add life back to those years.

In this talk, Dr Hany Demian invites us to rethink everything we know about getting older. From stem-cell–based regeneration and exosome therapy to gene editing and epigenetic reset technologies, we'll explore how medicine is shifting from treating disease to engineering vitality. But if aging becomes optional, what happens to identity, inequality, purpose, even what it means to be human?

We can see our human manifest through genomics and with science we can influence and modify it to stay healthy, AI can predict with a great certainty our future health.

This isn't science fiction. It's the beginning of a new biological era. The real question is: if we could live younger, longer, would we choose to?

Biography:

Dr. Hany Demian is a leading regenerative medicine and pain management specialist whose innovative work bridges cutting-edge stem cell therapies and integrative care. As founder of Praesentia Healthcare, he pioneers treatments that help patients heal from within, using the body's own biology to restore function, reduce pain, and optimize performance. With a background spanning anesthesiology, interventional pain, and cellular science, Dr. Demian is redefining what's possible in modern healing.

Globalizing Regenerative Medicine: Advancing Education, Certification, and Innovation through the American Board and Academy of Regenerative Medicine

Rozina Badal Munir

American Board of Regenerative Medicine, USA

Abstract:

Regenerative medicine represents one of the most promising frontiers in modern healthcare. The rapid evolution of this field demands a globally standardized framework for education, training, and certification to ensure safe and effective clinical application. This presentation introduces the mission and structure of the American Academy/Society and Board of Regenerative Medicine (AASBRM) for developing comprehensive academic curricula, physician training modules, and internationally recognized certification pathways. With presence in over 30 countries and partnerships with universities and medical institutions, ABRM and AARM are working to bridge the gap between cutting-edge science and real-world clinical practice.

The talk will highlight:

• Key components of the Diplomat and Fellowship Certification Programs in Regenerative Medicine

• The structure and delivery of the Regenerative Medicine Academic Curriculum for medical students and professionals

• The importance of regulated, ethical, and evidence-based practice through global educational standards

• Case studies demonstrating the impact of certification and training on clinical outcomes and patient safety

• Recent technological and clinical advancements in the field, including cellular therapies, biomaterials, and AI-assisted regenerative approaches

This session aims to inspire clinicians, educators, researchers, and policymakers to collaborate in building a globally competent regenerative medicine workforce—one that is educated, certified, and equipped to deliver transformative care.

Biography:

Dr. Rozina Badal Munir is a physician specializing in diagnostic medical ultrasound and regenerative medicine education. She earned her MBBS from Khyber Medical College and holds multiple board certifications in sonography and regenerative medicine. She works as an Ultrasound Specialist and Instruc-

tor at Kaiser Permanente West Los Angeles Medical Center and serves as Global Development Director of the American Board of Regenerative Medicine (ABRM), where she has helped expand standardized training and certification across more than 30 countries. Dr. Munir is also active in global workshops, conferences, and medical education focused on ultrasound integration in regenerative and emergency medicine.

Role of Mesenchymal Stem Cells in Treatment of Systemic Illnesses

Navneet Boddu

Therapeutic Solutions Inc., USA

Abstract:

Chronic systemic organ failure is an important clinical problem with significant morbidity, mortality and socioeconomic impact worldwide. Unfortunately, there is no definitive or curative treatment for most of these conditions, and the management has been predominantly confined to supportive care, which necessitates the need for novel therapies. Mesenchymal stem cell (MSC) therapy has a vast array of preclinical data and early, preliminary clinical data that suggests its potential to regenerate and restore the function of damaged tissues and organs.

To evaluate the effectiveness of MSC therapy in managing multiorgan failure, utilizing currently available literature. A review of human randomized controlled trials (RCTs) and observational studies assessing the role of MSC therapy in managing or treating organ failure.

PubMed, Cochrane Library, US National Guideline Clearinghouse, Google Scholar, and prior systematic reviews and reference lists were utilized in the literature search from 1990 through May 2020. In this lecture, studies that included embryonic stem cells, induced pluripotent stem cells, differentiated MSCs into specific lineage cells, and hematopoietic stem cells were excluded. Trials with intraorgan infiltration of MSC were also excluded.

The primary outcome evaluated the improvement in clinical assessment scores and indices of organ function. The secondary outcome assessed the safety of MSC therapy in the clinical trials.

This lecture is based on randomized control trials of MSC in humans for lung, heart, liver, kidney, musculoskeletal and COVID-19. The studies specifically assessed the effectiveness of MSC therapy in ARDS reported curative treatment, ischemic and nonischemic heart failure reported beneficial effects. Liver failure from different etiologies revealed favorable outcomes. Kidney failure showed positive results and Musculoskeletal disorders showed positive outcomes. The incidence of disease worsening or major complications was extremely rare from MSC therapy. There is a lot more animal data showing the safety and efficacy of MSC in organ failure.

Conclusions: MSC therapy seems to be promising to treat multiorgan failure. More studies are urgently needed to assess both safety and efficacy.

Biography:

Dr. Navneet Boddu is a U.S.-based physician in San Diego specializing in regenerative medicine and interventional pain management, with over 28 years of clinical experience. He is triple board-certified in Pain Medicine, Anesthesiology, and Perioperative Transesophageal Echocardiography. He is the founder and medical director of Advanced Pain and Regenerative Specialists in Oceanside, California, where he uses therapies such as PRP and stem cell-based treatments for musculoskeletal conditions. Dr. Boddu has been recognized multiple times as a Top Doctor and has received awards for excellence in regenerative medicine. He has published research on mesenchymal stem cells, contributed to textbooks, and was involved in FDA-authorized stem cell treatments during the COVID-19 pandemic for critically ill patients.