magnus Group

INTERNATIONAL CONFERENCE ON

CELL & STEM CELL RESEARCH

SEPT 16-17

VIRTUAL EVENT

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BOOK OF ABSTRACTS

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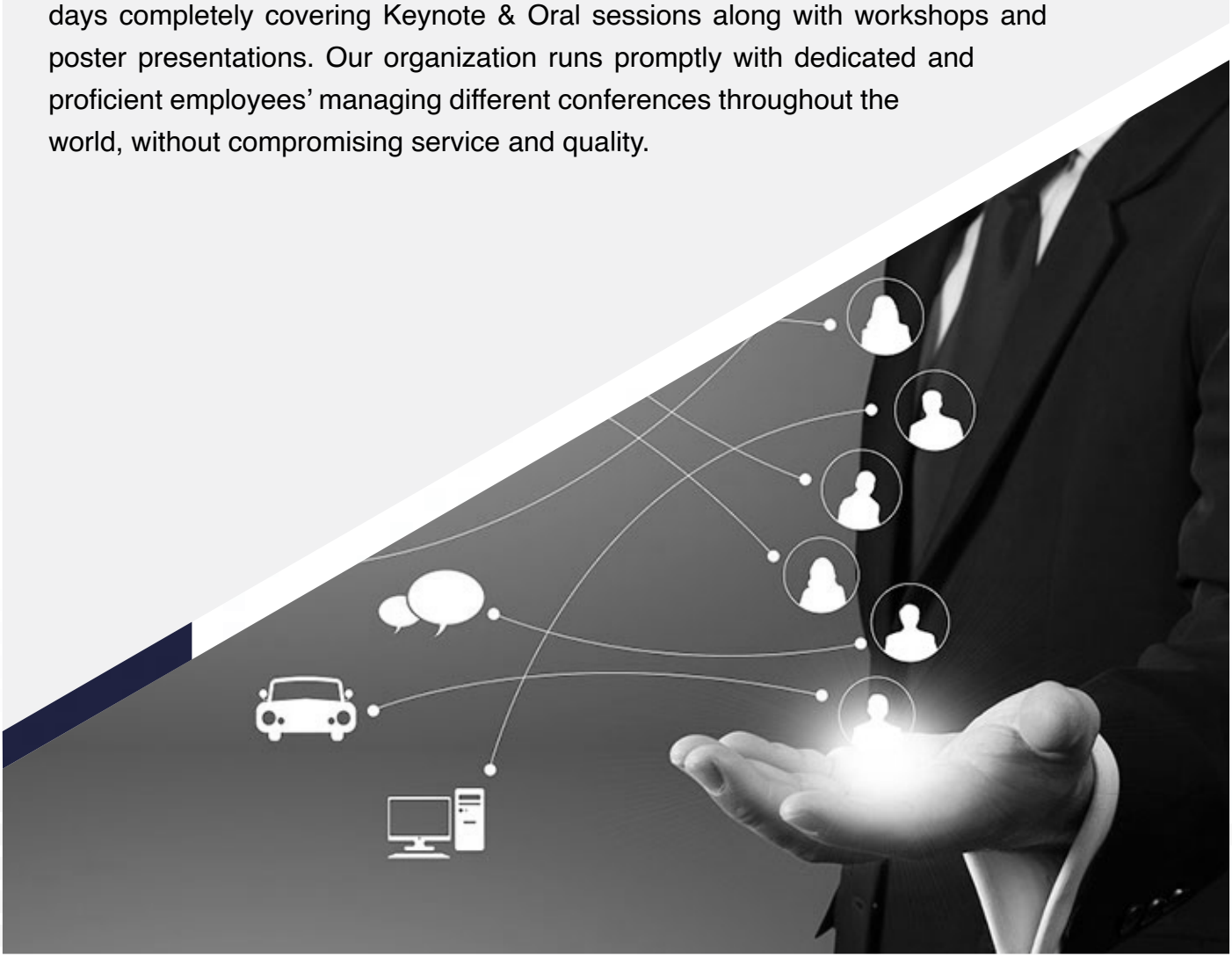
ABOUT MAGNUS GROUP

Magnus Group (MG) is initiated to meet a need and to pursue collective goals of the scientific community specifically focusing in the field of Sciences, Engineering and technology to endorse exchanging of the ideas & knowledge which facilitate the collaboration between the scientists, academicians and researchers of same field or interdisciplinary research. Magnus group is proficient in organizing conferences, meetings, seminars and workshops with the ingenious and peerless speakers throughout the world providing you and your organization with broad range of networking opportunities to globalize your research and create your own identity. Our conference and workshops can be well titled as 'ocean of knowledge' where you can sail your boat and pick the pearls, leading the way for innovative research and strategies empowering the strength by overwhelming the complications associated with in the respective fields.

Participation from 90 different countries and 1090 different Universities have contributed to the success of our conferences. Our first International Conference was organized on Oncology and Radiology (ICOR) in Dubai, UAE. Our conferences usually run for 2-3 days completely covering Keynote & Oral sessions along with workshops and poster presentations. Our organization runs promptly with dedicated and proficient employees' managing different conferences throughout the world, without compromising service and quality.



ABOUT STEM CELLS 2022

Magnus group cordially invites everyone to attend "**International Conference on Cell & Stem Cell Research**" Stem Cells 2022 which is slated as Online Event during **September 16-17, 2022**. The conference highlights the theme "*Expanding stem cell lines through novel approaches*"

Stem Cells 2022 will bring together experts from all corners of the world who are interested in discussing, sharing, exchanging and exploring new avenues in stem cell research and development. The three-day scientific session will cover all frontier topics in Stem cell Transplants, Bone marrow Transplants, Cell Potency, Tissue and Organ Regeneration, Pluripotent Stem cells, Human Embryonic Stem cells and many more related to the field of stem cells.

This global summit is a venue for prevailing the gaps in the transformation of this multidisciplinary science of hope and addressing the issues. The congress will have an anticipated participation of Stem cell experts, Healthcare professionals, Researchers, Scientists, Professors from around the globe.

We are confident that this conference will be an unmissed opportunity to keep yourself abreast with the happenings in the field of stem cells and network with experts in your field.

KEYNOTE FORUM

DAY 01

INTERNATIONAL CONFERENCE ON

CELL & STEM CELL RESEARCH

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Roberto Gramignoli, MS, PhD

Dept. of Laboratory Medicine, Karolinska Institutet, Stockholm, Sweden

Liver cell therapies: From hepatocyte transplant to placental stem cell infusion

Thirty years ago, hepatocyte transplant was validated as effective and safe treatment for patients with acute and congenital liver disease. A severe shortage of useful liver tissues limits a wider application of this cellular therapy. Stem cell sources for hepatocyte transplants would be useful, and placenta represent a non-controversial and readily available source of stem cells that can be used in regenerative medicine. We previously reported as amnion epithelial cells (hAEC) from term human placenta express surface markers and genes characteristic of pluripotent stem cells. Importantly, they do not express telomerase, are not immortal and are not tumorigenic. Encouraged by the lack of tumorigenicity and hepatic differentiation *in vitro*, and *in vivo* we examined the efficacy of hAEC transplants in mouse models of acute liver failure and metabolic liver disease. We reported that hAEC transplants reverse acute liver failure and significantly improve different human-relevant immunocompetent preclinical models of metabolic disorders, without immunosuppressive drugs. hAECs have reported tolerogenic, anti-inflammatory and immunomodulatory properties, and characteristic membrane-bound or solubkle meditors expressed by hAEC may explain why allotransplants may be tolerated without added immunosuppression. Based on this strong preclinical data, we have received ethical approval to treat patients with liver disease with hAEC cellular therapy.

Audience Take Away

- Cell-based therapies are promising and important alternative treatment, and allogenic stem cell infusion have been attempted and are changing the way we are treating life-threating disease.
- The audience will benefit from revision of the past 3 decade of cell-based therapies for liver disorder, with a glimpse on the innovative application.
- Several groups worldwide have switched their attention on perinatal stem cells, and amnion derived cells in particular.
- Immunosuppressant-free cell therapies may represent a game-changer in regenerative medicine and innovative treatments.
- The presenter will offer state-of-the-art description and illustrate recent findings in the filed of regenerative and interventional medicine.
- Perinatal stem cells, and amnion epithelial cells in particular, have shown promising results and efficacy in several preclinical models (not only liver-based) and proved safety/efficacy in clinical trial.

Biography

Roberto Gramignoli working as Senior Researcher and Group Leader at karolinska Institutet. He is specialized in Medical Genetics and has a PhD in Molecular and Translational Medicine. During his post-graduate studies at Univ. of Pittsburgh (PA-USA) he identified and proposed new solutions for roadblocks limiting clinical Hepatocyte Transplantation. Due to the paucity of human hepatocytes, he investigated alternative sources, such as iPS and placental stem cells. Working with his Mentor, Dr Strom, they became the first group to get approval for isolation and clinical infusion of human hepatocytes and amnion epithelial stem cells (AEC).

Federico Carpi

Department of Industrial Engineering, University of Florence, Italy

Electroactive polymer-based smart scaffolds for tissue engineering and regenerative medicine

Cellular scaffolds are a critical component of any system for tissue engineering and regenerative medicine. So far, poor attention has been focused on scaffolds that can mimic the extracellular matrix not only statically, but also dynamically, especially for tissues that have to experience large variable deformations (e.g. muscular, cardiac and lung tissues). This talk will introduce ElectroActive Polymers (EAPs) as a promising technology in order to provide cellular scaffolds with intrinsic actuation capabilities. EAPs consist of synthetic materials capable of changing dimensions and/or shape in response to an electrical stimulus. They show useful actuation properties, such as sizable active strains and/or stresses, large compliance, low density, low power consumption and ease of processing. Ongoing research in our group will be described, showing soft and electromechanically activated bioreactors with inherent cell stretching functions. They are investigated to deliver controllable mechanical stimuli to cell cultures, in order to regulate their developmental processes. The talk will show how the greatest promise of the proposed technology relies on its high versatility, compact size, low weight and scalability, as well as low cost.

Audience Take Away

- Basic aspects of electroactive polymers.
- New opportunities offered by electroactive polymers for tissue engineering.
- Ongoing studies on electromechanically activated soft bioreactors.

Biography

Federico Carpi is an Associate Professor in Biomedical Engineering at the University of Florence, Department of Industrial Engineering, Florence, Italy. He received from the University of Pisa the Laurea degree in Electronic Engineering in 2001, the Ph.D. degree in Bioengineering in 2005 and a second Laurea degree in Biomedical Engineering in 2008. From 2012 to 2016 he has been an Associate Professor (Reader) in Biomedical Engineering and Biomaterials at Queen Mary University of London, School of Engineering and Materials Science, UK. Since 2016, he is with the University of Florence, where he leads the 'SMART – Soft Matter ARtificial muscles and Transducers' research group (www.smart.unifi.it). His research interests include smart material-based biomedical and bioinspired mechatronic devices, and polymer artificial muscles. His publications include some 70 articles in international journals, 3 edited books and several contributions to books and conferences.

SPEAKERS

DAY 01

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Dr Anjali Goyal
Associate Professor, Department of Pathology, Smt NHL Municipal Medical College, Ahmedabad Gujarat

Sources & applications of Mesenchymal stem cells

There has been an evolution of the Cellular therapy over the last decade both at the level of in vitro and in vivo preclinical research and in clinical trials. Both the Embryonic stem cells and non-embryonic stem cells have all been explored as potential therapeutic strategies for a number of diseases. One type of adult stem cells, Mesenchymal Stem Cells, has generated a great amount of interest in the field of regenerative medicine due to their unique biological properties & widespread clinical applications.

MSCs were first discovered in 1968 by Friedenstein as an adherent fibroblast-like population in the bone marrow capable of differentiating into bone. Following this, they were extracted from a myriad of other sources like the Umbilical cord, Adipose tissue, Wharton's Jelly, Chorionic Plate to name a few.

The criteria to identify and characterize MSCs were discussed by The International Society for Cellular Therapy (ISCT). Along with the properties of self-renewability, multipotency, and easy accessibility, the stem cells are associated with numerous mediators, cytokines, and signalling molecules which can modulate an inflammatory response and control the infiltration process that finally leads to a regulated tissue repair/healing or regeneration process, making them a potential therapeutic target for immune mediated disorders, as also for immune-dysregulating infectious diseases like COVID- 19.

A various Sources & the Therapeutic targets of the Mesenchymal stem cell over the past decade is hence a very interesting subject for the future research.

Biography

Dr. Anjali Goyal is an Associate Professor in Pathology after graduating from CMC Ludhiana (Punjab) in 1991 & completing MD pathology at LTMMC Sion(Bombay) in 1997. She is a Cartilage Histopathologist working on Cartilage Repair & the role of Chondroprogenitors and also as a consultant histopathologist for stem cell related projects at CMC Vellore.

Ke-Yu Deng* and Hong-Bo Xin

Institute of Translational Medicine, Nanchang University, PR China

Roles and mechanism of human amniotic Mesenchymal stem cells in the treatment of liver fibrosis

Stem cell therapy has been considered as practical and attractive approach for treatment of many diseases clinically in recent years. Human amniotic mesenchymal stem cells (hAMSCs) are derived from the amnion tissues of the placenta which is normally discarded upon delivery, and they are a relatively easy accessible type of stem cells without ethical concerns. In addition, the hAMSCs were characterized with non-tumorigenicity, low immunogenicity, high histocompatibility and strong proliferation. Studies have shown that mesenchymal stem cells (MSCs) from a variety of tissues can improve liver fibrosis. Recently, we observed that hAMSCs significantly protected mice from liver fibrosis in vitro and the underlying molecular mechanism has been elucidated in vivo and in vitro. Obviously, our study will provide an insight in the treatment of liver fibrosis clinically.

Audience Take Away

- Practical protocol to isolate and identify amniotic stem cells.
- The advantages and benefits of amniotic stem cell.
- Possibility of hAMSC in treatment of liver fibrosis.

Biography

Dr. Ke-Yu Deng is currently working in Nanchang University, PR China. She has been the faculty member of the Institute of Translational Medicine, Nanchang University since 2011. She has published more than 50 research articles in SCI(E) journals. Her research interests have been focused in finding an efficient therapeutic approach to treat chronic fibrosis and exploring the underlying mechanisms.

Alessandra Salvetti[1]*, Gaetana Gambino[1], Leonardo Rossi[1]
[1]Department of Experimental and Clinical Medicine University of Pisa, Pisa, Italy

Transcriptional changes are induced by sub-lethal 5-fluorouracil treatment in planarian stem cells

The in vivo study of mammalian adult stem cells and their relationship with neighbortissues, the so called niche, is problematic due to the rareness of these cells dispersedinto host tissues. Planarians, endowed with an abundant and experimental accessiblepopulation of pluripotent adult stem cells, the neoblasts, represent an alternative model system to challenge in vivo stem cell biology. Neoblasts are a transcriptionallyheterogeneous population of stem cells constantly involved in physiological cell turn-over and making planarians able to regenerate any missing body part. Challenging conditions causing a strong reduction in neoblast number, such as sub-lethal X-ray treatment, produce an impressive rescue process in which the remaining neoblasts repopulate the entire body, thus representing an ideal model system to understand the mechanisms orchestrating neoblast dynamics/fate. We identified the treatment with the genotoxic drug 5-fluorouracil (5-FU) as a new challenging condition that promotes a strong reduction in proliferating cells. By whole mount in situ hybridization, immunostaining and BrdU labeling we analyzed the expression ofseveral markers for stem cells, committed cells and differentiated tissues.We found that 5-FU treatment inhibits cell proliferation producing deep changes in stem cell transcriptional profile which loss the expression of canonical markers for stem cell pluripotency. However, after an initial latency period some of these cells next to the ventral nerve cords, reacquire a pluripotency transcriptional signature, reenter cell cycle and repopulate the entire complex neoblast system. Our findings support the possibility that at least some neoblasts, in the earlier steps of commitment (or even post mitotic early progeny), can modify their expression profile and reacquire a widerdifferentiative potential suggesting a great plasticity of planarian stem cells in vivo.

Biography

Alessandra Salvetti obtained her MSc in biology (cum laude) at the University of Pisa and, in the same institution, she got a PhD in cell and developmental molecular biology and biophysics. She is associated professor at the University of Pisa where she teaches applied biology and molecular genetics. She has a long-held experience in the study of molecular and cellular mechanisms for stem cell maintenance, homing and differentiation using alternative animal models.

Dr. Madhu Gupta
Department of Pharmaceutics, School of Pharmaceutical Sciences, Delhi Pharmaceutical Sciences & Research University- 110017

Placental therapy: Is really a natural weapon for wound healing therapy?

Placental extract formulation Regenerin (Patent no- RU 2469704 CI, dt: 07.07.2011) has been reported to possess antioxidant, antimicrobial, anti-inflammatory, cellular proliferation, and tissue regeneration properties. Considering the properties of placental extract, the present investigation was undertaken to investigate the effectiveness of this formulation in rat diabetic foot ulcer (DFU). Diabetes was induced by intraperitoneal (i.p) injection of 65 mg/kg of Streptozotocin (STZ) in rats and open excision wounds were produced in feet by using scalpel. The formulations were topically applied to all the groups once a day till the complete healing was achieved. Blood glucose monitoring, body weight, food and water content, parameters were measured weekly. Wound healing was assessed by analyzing % wound closure,wound area measurements, hydroxyproline content, epithelialization period, and inflammatory marker CRP At the end of study, foot was excised for histopathology and hydroxyproline level. Treatment with Regenerin gel produced decrease in wound size and increased epithelization from 8th day which continued until 18 days when complete closure was found. Regenerin-gel showed the higher hydroxyproline content, decrease in inflammatory markers, neovascularization as well as increases the collagen deposition. It can be concluded from this study that topically applied regernerin-gel may be a potential approach for faster wound healing for treatment of chronic diabetic wounds.

Audience Take Away

- They can get the exposure of regenerative based medicine and resources.
- The newer area for their learning will be explored.
- Yes, other scientific community can get benefitted with this research.
- Yes, its provide more simple and effective formulation.

Biography

Dr. Madhu Gupta is working as an Associate Professor in Delhi Pharmaceutical Science and Research University, New Delhi. She has research experience pertaining to drug delivery to nanoformulations for magical molecule delivery, bioligands for targeting of bioactives and drug moiety, biopolymers, cancer nanomedicine as well as topical delivery. She has over 80 research publications to her credit published in journals of high scientific impact and contributed 30 chapters in various renowned books with h index 20 and more than 1000 citations.. She has the recipient of Research Excellence of the Year 2020, Youth Education Icon of the Year 2018, Young Scientist Award, Best Administrative Service Award, IDMA-G.P. Nair award and Prof. C.S. Chauhan award, BioAsia Innovation Award – 2012, Grace India awards. She has also filed the PCT patent for effective wound healing therapy.

K P Mishra
Ex Bhabha Atomic Research Center, Mumbai 400085 India and Foundation for Education and Research, India

Cancer stem cell radiosensitivity is predominantly controlled by intracellular ROS

Cancer stem cells (CSC) in tumor volume exhibit resistance to radiation therapy. It is observed that both normal stem cells (NSC) and CSC maintain low levels of reactive oxygen species(ROS) and other free radical species in their cytosol. The primary radiation therapy eliminates the major mass of the tumor but the surviving tiny amount of CSC in the tumor volume is found to be radioresistant which facilitates tumor re-growth and relapse of cancer in the treated patients. Among other contributing cellular factors, ROS is believed to be an important determinant of radioresistance of CSC. It needs to be noted that CSCs exhibit slow proliferation making radiotherapy less efficient to eliminate them because rapidly dividing cells are more prone to radiation damage. Radioresistance of CSCs is the major cause of insensitivity of tumor to radiation. This review aims to examine the role of ROS in tumorigenesis, in DNA damage and repair, cell proliferation. It is argued that an easily adoptable strategy seems to induce apoptotic death in CSCs. It thus appears warranted to search for apoptotic inducer drugs to eliminate the CSCs for improving cancer radiotherapy. In this review, an attempt is made to delineate the underlying molecular mechanisms and explore the strategies to promoting the CSC sensitivity to radiation by persuading tumor cells to undergo apoptosis and other death pathways. Emphasis is given to developing CSC targeted pharmacological drugs apart from commonly employed anticancer drugs. A part of the review consists in outlining the intrinsic molecular mechanisms of CSC in rendering them resistance to therapies and to point out new approaches for the improvement of treatment outcome in cancer radiotherapy.

Biography

Dr K.P.Mishra, Ph.D. President, Asian Association for Radiation Research (AARR), 2017-2021, Former Vice Chancellor,NGB University, Allahabad, Ex Head, RB&HSD,Bhabha Atomic Res. Center,Mumbai, President,Foundation for Education and Research, India (FERI)

Mohan Malleshaiah

[1]Montreal Clinical Research Institute (IRCM), Montreal, Quebec, Canada.

[2]Department Biochemistry and Molecular Medicine, University of Montreal, Montreal, Quebec, Canada

Altering stem cell states by controlling cell signaling information

Cell fate determination induced by cell signaling is central to stem cells and regenerative medicine. Pluripotent stem cells such as embryonic stem cells (ESC) are an attractive model for understanding the relationship between cell signaling and cell fates. Cultured mouse ESCs are heterogeneous and can exist in multiple cell states such as Totipotent, Pluripotent, Primed and Primitive Endoderm. Such heterogeneity can compromise stem cell applications. The signaling mechanisms regulating the Totipotent state acquisition and coexistence of these multiple cell states are poorly understood. In this study, we identify BMP4 as an inducer of the Totipotent state. However, we discovered that BMP4-mediated induction of the Totipotent state is constrained by the cross-activation of FGF, TGF-β and WNT pathways. We exploited this finding to enhance the proportion of Totipotent cells in ESCs by rationally inhibiting the cross-activated pathways using small molecules. Next, we utilized single-cell mRNA-sequencing (scRNA-seq) to analyze the resulting impact on cellular heterogeneity. The scRNA-seq analysis revealed that induction of the Totipotent state is accompanied by the suppression of both the Primed and Primitive Endoderm states, thus reducing the overall stem cell heterogeneity. Furthermore, the reprogrammed Totipotent cells generated in culture have a molecular and functional resemblance to Totipotent cell stages of the preimplantation embryo. Our findings reveal a BMP4 signaling mechanism in ESCs to regulate multiple cell states, potentially significant for managing stem cell heterogeneity in differentiation and reprogramming.

Audience Take Away

- The audience will learn about stem cell heterogeneity and its implication in regenerative medicine.
- My talk will present the potential molecular mechanisms behind stem cell heterogeneity and how our efforts in understanding these mechanisms have led us to control it.
- The results from my talk will inspire the audience to think about creative solutions to control stem cell heterogeneity and mitigate its impact on regenerative medicine.

Biography

Dr. Mohan Malleshaiah studied Biotechnology at the Bangalore University, India and graduated as MS in 2002. He then worked for two years in the field of drug discovery at Aurigene Discovery Technologies. Inspired to pursue research, he then obtained PhD degree from the University of Montreal, Canada, in the field of Biochemistry. After postdoctoral fellowship at the Harvard Medical School, USA, he started independent research career in 2018 as an Assistant Professor at the Montreal Clinical Research Institute (IRCM) in affiliation with the University of Montreal. Dr. Malleshaiah lab works on stem cells, cell reprogramming, disease modelling and pancreatic cancer.

De-Quan Li*, M.D., Ph.D.,[1] Stephen C. Pflugfelder, M.D.,[1] Rui Chen, Ph.D.[2]

[1]Ocular Surface Center, Cullen Eye Institute, Department of Ophthalmology, Baylor College of MedicineHouston, Texas, USA; [2]HGSC, Department of Molecular and Human Genetics, Baylor College of Medicine, Houston, Texas, USA.

Single-cell transcriptomics discovers unique markers for human corneal epithelial stem cells

Purpose: Human corneal epithelial stem cells, also referred to as limbal stem cells (LSCs), have been recognized to locate in corneal limbus for three decades. However, the molecular identity and definitive markers of LSCs are still elusive. This study aimed to uncover novel cell types in heterogenous basal limbusof human cornea for identifying LSC population at single cell resolution.

Methods: Single cells of human limbal basal epithelium were isolated from young donor corneas. Single-cell RNA-Sequencing was performed using 10x Genomics platform, followed by clustering cell types through the graph-based visualization method Uniform Manifold Approximation and Projection (UMAP)and unbiased computational informatic analysis. Tissue RNA in situ hybridization with RNAscope, immunofluorescent staining and multiple functional assays were performed using ex vivo donor corneal tissues and in vitro culture models of primary human limbal epithelial cells (HLECs).

Results: Single-cell transcriptomics of 16,360 limbal basal cells revealed 12 cell clusters belonging to three lineages. A smallest cluster (0.4% of total cells) was identified as LSCs based on their quiescent and undifferentiated states with enriched top expressed genes known as markers of putative epithelial stem cells. TSPAN7 gene coding Tetraspanin 7 protein was discovered and validated as a unique LSC marker based onits exclusive expression pattern and spatial localization in limbal basal epithelium by RNAscope and immunofluorescent staining, as well as the functional role in cell growth and tissue regeneration models in cultures with or without RNA interference. Interestingly, five cell types/states mapping a developmental trajectory of LSC from quiescence to proliferation and differentiation are uncovered by Monocle3 and CytoTRACE pseudotime analysis. The transcription factor networks linking novel signaling pathways are revealed to maintain LSC stemness.

Conclusions: This human corneal single-cell transcriptomics uncovers unique markers that identifies the LSC population, and reveals novel cell types mapping the differentiation trajectory in heterogenous limbal basal epithelium. The findings provide insight into LSC concept and benefit stem cell expansion for clinical use. This study lays the foundation for understanding the corneal homeostasis and diseases.

Audience Take Away

- Single-cell transcriptomics opens a new window to uncover novel cell types/lineages that are previously not defined in the heterogeneous basal limbus.
- LSC population was identified based on the quiescent and undifferentiated states with enriched novel marker genes.
- Five cell types mapping LSC developmental trajectory from quiescence to proliferation and differentiation are uncovered.
- TSPAN7 was validated as a unique LSC marker based on its exclusive expression pattern and functional roles, which can be applied to promote stem cell expansion for clinical use.

Biography

De-Quan Li, M.D., Ph.D., Associate professor, joined Ocular Surface Center, Cullen Eye Institute, Department of Ophthalmology, Baylor College of Medicine since 2001. He has a broad background in cellularand molecular biology with main interest in inflammation, mucosal immunology, and corneal epithelial stemcell biology. Focused on ocular surface biology and diseases, he has awarded 41 research grants, including federal grants from NIH and Department of Defense. He has published 11 book chapters and 150 original articles in peer-reviewed scientific journals and trained 46 postdoctoral fellows from all over the world.

Alireza Shams, Saman Ebrahimi
1-Department of Anatomy, School of Medicine, Alborz University of Medical Sciences, Karaj, Iran
2-Department of Biology, Science and Research Branch, Islamic Azad University, Tehran, Iran

In vitro induction of Mesenchymal stem cells into male germ-like cells by retinoic acid and titanium nanotubes-coated fibrin

Background: The global health community has dramatically improved maternal and child health, during the past few years; azoospermsia is a key component of reproductive health. Our purpose is to survey and promote the potential of mouse bone marrow mesenchymal stem cells (mBMMSCs) differentiation into late-stage male germ-like cells (MGLCs) as an outlook to use these cells in infertility treatment.
Materials and Methods: The in vitro mBMMSCs differentiation into MGLCs was promoted by applying the effective concentration of retinoic acid (RA) and culturing them in titanium nanotubes (TNTs)-coated fibrin (F+TNT) formation as a 2D scaffold afterward. The biocompatibility and morphology of the TNTs and the F+TNT properties were examined by MTT and Scanning Electron Microscope (SEM) analysis, respectively.
Results: The optimum biocompatibility dose of TNTs was found 50 µg/ml for differentiation after 14 days. The morphology of the TNTs and F+TNT were confirmed using SEM and Raman spectrum, respectively. After culturing the mBMMSCs in RA and F+TNT formation with RA, a male germ cells specific marker, Dazl, expression, and the cells' integrity in fibrin were revealed using Western Blots and Real-Time quantitative PCR (RT-qPCR). ($P < 0.05$).
Conclusion: We investigated mBMMSCs can be differentiated into MGLCs in a medium containing 10-5 M RA in which the specific marker was expressed properly in 2D F+TNT formation. In addition, F+TNT could offer a proper 2D scaffold for mBMMSCs-derived germ-like cells regarding in vitro maturation (IVM) of assisted reproductive technology (ART).

Audience Take Away

- We are trying to help the audience to guide for producing artificial gamete from stem cell and how to it in later projects in this field.
- We indicated that mouse bone marrow mesenchymal stem cells (mBMMSCs) could differentiate into late-stage male germ-like cells (MGLCs). Our results of the ability to produce MGLC from mBMMSCs provide a model for elucidating the mechanism of MGLCs development and have potential applications in the non-obstructive azoospermia (NOA) treatment.
- This study will help the audience some ways to use another elements for architecting in a series of new plans and projects for differentiation of stem cell to male or female gametes.
- The audience can begin some well-developed project to use embryonic or adult stem cell stem cell to induce or differentiate to gametes in IVF Cliniques or detect specific agent could influence in final pathway of the cell and establish some 3D scaffolds in future academic retrenches.

Biography

Dr. Alireza shams studied physiotherapy at the Tehran University, Tehran and graduated as Anatomy MS and received his PhD degree at Tarbiat modares university Tehran, Iran. After 1 year postdoctoral fellowship supervised by Dr David Hopkins at Dalhousie university, Halifax, Canada. He obtained the position of an Associate Professor at the Alborz medical University and doing some r in vivo and in vitro projects on cell differentiation and 3D scaffolds in tissue engineering he has published more than 30 research articles in domestic and Isi journals

Dr.Muhammed Rauf Ahmed
Shaheed Zulfiqar Ali Bhutto Medical University/Islamabad, Pakistan

ADMSCs and platelets rich plasma in combination can regenerate the articular cartilage

To observe the combined effect of platelet-rich plasma (PRP) and preconditioned adipose-derived mesenchymal stem cells (ADMSCs) on the injured articular cartilage of the rat.

Materials & methods: Animals in the study received an intra-articular injection of PRP and preconditioned ADMSCs, both in combination and separately. The response to therapeutic intervention was evaluated by inflammatory markers, proteoglycans content, chondrogenesis and gene expression analyses.

Results: The combined therapy resulted in a reduction of *IL-6* and *TNF-α*, increased proteoglycan content of the articular cartilage, upregulation of *Acan*, *Col2a1* and *PCNA* genes. Downregulation of *Col1a1*, *Col10a1* and *Casp3* genes was observed as compared with the untreated osteoarthritis rat model.

Conclusion: PRP potentiates the effects of ADMSCs on the repair of damaged articular cartilage.

Biography
Muhammed Rauf Ahmed, assistant Professor in Shaheed Zulfiqar Ali Bhutto Medical University Islamabad. Recently working on skin regeneration and on cartilage regeneration.we are using PRP and stem cells and getting good results in skin and cartilage regeneration.

Gulay Sezer[1,2*], Arzu Yay[2,3], Zeynep S. Sarica[4], Zeynep B. Gonen[2], Gozde O. Onder[3], Rumeysa Goc[5], Secil Yilmaz[2]

[1]Department of Pharmacology, Faculty of Medicine, Erciyes University, Kayseri, Turkiye

[2]Genkok Genome and Stem Cell Centre, Erciyes University, Kayseri, Turkiye

[3]Department of Histology and Embryology, Faculty of Medicine, Erciyes University, Kayseri, Turkiye

[4]Department of Animal Research, Central Research Laboratory, Gebze Technical University, Kocaeli, Turkiye

[5]Department of Histology and Embryology, Faculty of Medicine, Cumhuriyet University, Sivas, Turkiye

The therapeutic potential of Mesenchymal stem cells in the treatment of chemotherapy-related side effects

Mesenchymal stem cells (MSCs) are among the most commonly used cell types in regenerative medicine, as they can be easily obtained from a variety of sources, and are suitable for the auto- and allogeneic transplantations due to their immunomodulatory and low immunogenicity properties. A large number of studies have shown the beneficial effects of MSC-based therapies in the treatment of different pathologies, including neurological disorders. There are many studies on the prevention and treatment of the side effects caused by chemotherapy, but there is no proven way to prevent neuropathy. We investigated if MSCs have any beneficial effect in the chemotherapy induced side effects such as nephrotoxicity, testicular damage and peripheral neuropathy in rats. MSCs reduced chemotherapy induced autophagy markers in testicular tissue significantly. Degeneration of renal tubules and peripheral neuropathy were less in MSCs transplanted group. MSCs transplantation significantly attenuated acute kidney injury, testicular damage and neuropathic pain in rats. MSCs may exert their effects by localization to damaged tissues and/or secretion of several molecules. It has been reported that MSCs transplantation is safe and does not cause organ toxicity, but, MSCs in the tumor microenvironment can confer pro- or anti-tumorigenic potential so the therapeutic potential of MSCs in cancer is still controversial. So, further studies are needed to elucidate the underlying mechanisms and to prove their safety and efficacy in clinical settings.

Biography

Dr. Gulay Sezer studied Pharmacy at the Hacettepe University, Ankara, Turkiye and graduated as MS in 2002 from Erciyes University. She received her PhD degree in 2007 from the same institution, Faculty of Medicine, Department of Pharmacology. During her doctorate, she had the opportunity to work in the Department of Pharmacology of the Polish Academy of Sciences in Krakow, Poland. She is an Associate Professor at Erciyes University. She works on stem cells, cancer treatment and prevention of chemotherapy-related side effects.

POSTERS

DAY 01

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Eleftheria Karanika[1*], Katerina Soupsana[1,2], and Spyros Georgatos[1]

The Laboratories of Biology[1] and Biological Chemistry[2], University of Ioannina, Faculty of Medicine, Ioannina, Greece

Haspin regulates transcription of key spermiogenesis genes

Haspin is a serine/threonine kinase that phosphorylates histone H3 at threonine 3 (H3T3ph). It is involved in chromosome alignment, centromeric cohesion and spindle stability, as well as in positioning of the Chromosomal Passenger Complex (CPC) at centromeres. H3T3ph is also part of a combinatorial modification pattern, termed PMM (H3T3ph-H3K4me$_3$-H3R8me$_2$), which is also detected during mitosis. This study focuses on the functional role of Haspin in mouse embryonic stem cells (mESCs) and adult testes. Ectopic overexpression (OE) or knockout (KO) of Haspin did not significantly alter the self-renewal or differentiation capabilities of mESCs. However, RNA sequencing experiments revealed that Haspin dosage affects the expression levels of several male gametogenesis genes, such as *Scml2*, *Dazl, ZFY1/2 and Eif2s3y*. Immunohistochemical analysis of mouse testes showed that the H3T3ph mark is detected initially only in mitotic spermatogonia. As the gonad develops and matures, the entire PMM modification pattern can be found in haploid spermatids. This spatiotemporal pattern indicates that H3T3ph, and as a consequence Haspin, is involved in regulating the spermatogenesis-spermiogenesis expression program, probably through a binary phospho-methyl switch.

Audience Take Away

- This work addresses an interesting problem in developmental cell biology: the functional role of the atypical kinase haspin, which phosphorylates histone H3 at threonine-3 (H3T3ph).
- We show that mouse embryonic stem cells that lack or overexpress haspin are prone to chromosome misalignment and spindle defects, but the pluripotent state is not disturbed and the stem cell population can still self-renew and differentiate into multiple lineages. We also find that haspin dosage affects severely the expression of genes involved in male gametogenesis.
- While H3T3ph is detected exclusively in mitotic spermatogonia in immature testes, it becomes conspicuously present in haploid spermatids after attainment of sexual maturity.
- The spatiotemporal pattern of H3T3-phosphorylation during the cycle of the seminiferous tubule leads to a challenging hypothesis: that haspin might be involved in the switching from the spermatogenesis to the spermiogenesis-specific gene expression program by regulating a phospho- methyl switch. This emerging hypothesis is expected to stimulate further research in this topic.

Biography

Dr. Karanika studied in the Department of Biological Applications and Technologies at the Ioannina University, Greece and graduated in 2011. She then joined the research group of Prof. Georgatos, Faculty of Medicine, University of Ioannina. She received her PhD degree in 2018 and did her post-doc in the same lab. She has published 3 research articles in SCI(E) journals.

Romuald Teguia Doumbi[1,*], Guy Bertrand Noumi[1], Domga[2]

[1]University of Ngaoundere, Department of Chemistry, Faculty of Science (FS), Cameroon

[2]University of Ngaoundere, National School of Agro-Industrial Sciences (ENSAI), Department of Applied Chemistry, Cameroon

Preparation and characterization of Ti/SnO_2-Sb-NSG electrode for optimization the direct oxidation of methyl orange dyes using box-benhken design

The degradation of methyl orange (MO) was studied by the direct electrooxidation using nitrogen and sulfur co-doped graphene (NSG) supported antimony doped tin oxide (Ti/SnO_2-Sb). The Sol gel and microwave technics were used to prepare the electrode material (Ti/SnO_2-Sb-NSG). Raman, XRD, and FTIR spectroscopy analyses help to confirm the coating of titanium substrate with the SnO_2-Sb-NSG film. Linear sweet voltammetry results show that the Ti/SnO_2-Sb-NSG material possesses high oxygen overvoltage, which is an important characteristic of anodic materials for electrochemical direct oxidation. The effect of three independent variables including electrolysis time, current density and dye concentration on the performance of the anodic oxidation system was modeled using the Box-Behnken Design[4]. The optimum conditions for MO degradation were a current density of 18 mA/cm^2, an electrolysis time of 6 h and a dye concentration of 29 mg/L. However, based on these optimums, MO was degraded at 98.71 %. Based on the intermediate compounds, the degradation mechanism of MO at the Ti/SnO_2-Sb-NSG anode was proposed. Furthermore, the lifetime of Ti/SnO_2-Sb-NSG electrode was about 31.6 h while Ti/SnO_2-Sb electrode was 9.0 h. Based on the results, direct electrooxidation using Ti/SnO_2-Sb-NSG electrode could be a proper process for the treatment of textile wastewater.

Audience Take Away

- At the end of this presentation, the audience could be interested to the advanced oxidation processes which are known as green techniques for removal almost the persistent and emergent pollutants.
- The audience could also learn how to use easy and low-cost methods for the preparation of high efficiency electrode materials.
- The using of surface response methodology for the optimization of process in this work, could be used by some company and instructed to students in order to help them to manage the planification of experiences during their research works.
- In developing countries, water is lack and isn't still safe for population. Moreover, during the treatment process by the company in charge to manage and share water in these countries, quality of produced water is bad and the methods used aren't efficiency for the removal or degradation of persistent and/or emergent pollutants. This work could help to know how the company can use the advanced oxidation processes using low-cost material electrodes with the combination of the existing methods.

Biography

Dr. Romuald studied Chemistry at the University of Ngaoundere, Cameroon and graduated as MS in 2018. I then joined the research group of Prof. Noumi at the Department of Chemistry, Faculty of Science, University of Ngaoundere. I received her PhD degree in 2022 at the same institution. After I began to give some Inorganic courses in this department. I have published 6 research papers in SCI(E) journals.

Neus Figa-Martin[1*] and Dr Xavier Tintore Caicedo[2]
[1]Exolab, Clínica Exolife, Barcelona, Catalunya, Spain
[2]Clínica Exolife, Barcelona, Catalunya, Spain

MSC-Exosomes in osteoarthritis treatment

Osteoarthritis (OA) is the most common degenerative joint disease in adults, as well as a major cause of painand disability. Despite its broad prevalence and severe impact both on individual health and economic level,the available treatments hardly manage to calm the pain and, more importantly, lack the capability to restore degraded cartilage or decelerate disease progression. The need to find a treatment to effectively reduce pain and improve functionality in the damaged joints seems to be possible with the use of mesenchymal stem cells (MSCs). Those cells, ideally autologous, can be obtained from adipose tissue or bone-marrow (among other sources) and may be differentiated into lineages of interest, like chondrocyte or osteoblast in this case. MSCs have a dual functionality interesting in OA treatment: immunoregulation and regeneration, a combination that allows to reduce pain and inflammation as well as to repair injured tissue. Later studies demonstrate that these properties could also be found in some nanovesicles that thosecells secrete, the exosomes. The use of exosomes is a step further in the way of finding the ideal treatmentin OA: they have low or no immunogenicity (therefore its allogenic use a suitable option) and can be easily stored either frozen or lyophilized. Thanks to these characteristics, exosomes can be obtained from a healthydonor and produced in great quantities to create a bank, from which single doses can be distributed to anyclinician desiring to treat any patient. Contrary to MSCs transplant, allogenic usually increase waiting time for the patient and could even cause losing the opportunity to treat those individuals who do not meet the criteria for that kind of intervention. Moreover, the possibility to store and send the product abroad, couldallow sending the treatment to any health center even if they have no laboratory to produce exosomes themselves.

In our experience, this treatment can restore damaged joints even in cases where other therapeutic options failed, improving the patient's health and quality of life.

Audience Take Away

- The presentation will summarize the last articles regarding the use of MSCs and exosomes as a treatment in OA.
- The audience will learn in a deeper extent about the use of MSCs exosomes as an alternative to MSC transplant, regarding security, efficiency, and cost.
- The process for MSC exosome obtention, storage and application used in our laboratory will be presented.
- Real cases of human osteoarthritic joints will be shared to see their evolution after treatment with MSCs exosomes.

Biography

Neus Figa-Martin studied Pharmacy at Universitat de Barcelona (Catalonia) and graduated as MS in Advanced Immunology in 2019. After her experience in the research group of Prof. Eva Martínez Cáceres focused on multiple sclerosis, she joined Clínica Exolife where she gained knowledge on regenerative medicine with exosomes. Tutored by T.M Francisco Gutiérrez Castro and in partnership with Recell, a leadingclinical center located in Chile and specialized in exosomes, and Biogenica, the international scientific groupresponsible for the know-how, she is now focused on the goal to bring a clinical solution for those degenerative diseases pending for a suitable treatment.

KEYNOTE FORUM

DAY 02

INTERNATIONAL CONFERENCE ON

CELL & STEM CELL RESEARCH

16-17 SEPT

Pushpam Kumar Sinha

Independent Researcher, India

The common cure for all Cancers- clue from Cancer stem cells

For this talk I review seven different types of cancers: leukemia, pancreatic cancer, colon cancer, liver cancer, breast cancer, cervical cancer, and ovarian cancer, their experimental and clinical studies, to come up with a model of the genesis of cancer common to all types of cancers in which Cancer Stem Cells (CSCs) play the vital role. CSCs form by multiple genetic/epigenetic mutations occurring in multiple stages, spread over many years, in the otherwise healthy Adult Stem Cell (ASC), or ASC's Multi-Potent Progenitors (MPPs), or Mature Differentiated Cells (MDCs) in some cases like, for eg., in liver. As a result of these multiple mutations the CSCs begin to both proliferate and undergo apoptosis aggressively. It is the large scale of apoptosis of highly mutated stem cell that fools the homeostasis of organism, and henceforth the homeostasis is unable to detect that these highly mutated stem cells are defective and cannot take any corrective action against these highly mutated stem cells (the highly mutated stem cells by themselves have a sense that they are defective and hence program their own death which is called apoptosis, but the otherwise healthy cells and immune cells surrounding the highly defective mutated stem cells do not have a sense that these stem cells are defective- this is meant by the phrase fooling of homeostasis) . This is the genesis of cancer (i.e. fooling of homeostasis by pre-cancerous stem cells) common to all cancers. Because the highly mutated stem cells are undergoing apoptosis in large numbers the repair mechanism of these cells are triggered to take corrective action by up-regulating the particular glucose metabolism pathway known as pentose phosphate pathway (G6PD, an important enzyme in this glucose metabolism pathway is known to be over-expressed even in those cancer cells which were initially deficient in G6PD gene), and these cells thereby evolve into strong cells which do not further undergo apoptosis. Or the cells which survive apoptosis evolve into stronger cells by up-regulating this glucose metabolism pathway. Now we have only a bunch of highly proliferating mutated stem cells and cancer sets in. This hypothesis which I popularly call Fooling of Homeostasis Hypothesis (FHH) suggests two chemicals ethanol-alcohol dehydrogenase and sodium metabisulphite as the common cure for all cancers if directed only against the cancer cells. Both these chemicals are known depressants of pentose phosphate pathway.

Audience Take Away

- The audience will learn to appreciate the vital role of Cancer Stem Cells in most of the cancers.
- This research is sure to be used by other faculty in an attempt to prove the fooling of homeostasis hypothesis.
- This research prompts the scientific community to launch the clinical studies of the use of chemicals ethanol-alcohol dehydrogenase and sodium metabisulphite as a common cure for all cancers.

Biography

Pushpam Kumar Sinha is currently Head of the Department of Mechanical Engineering at Netaji Subhas Institute of Technology, Amhara, Bihta, Patna, India. But, however, 3-4 years ago he was pained to see 3 of his close family members succumbing to cancer, and since then he has been Independent Researcher on Cancer. He published his first paper on Cancer in November 2019. Since then he has published 6 papers on cancer. His paper on Cervical Cancer had been elected as the Best Article of the Issue in Acta Scientific Women's Health Journal.

Prem Ravi Varma P K

Medical Oncologist, Cochin cancer Research Centre, India

Resistance to Chemotherapy

Over the last decade, based on the extensive development of preclinical animal studies and clinical trials, the efficacy, and mechanisms of immunotherapy have been fully explored. Significant and lasting clinical responses with immunotherapy provide a new breakthrough treatment for a variety of refractory cancer histologies, which gradually change the treatment pattern of tumors. However, although immune checkpoint inhibitor drugs are promising for achieving longer-term efficacy, their benefits in the overall population are still very low, such as low frequency of response in some common tumor types such as breast and prostate, and heterogeneity in the degree of response among different tumor lesions in the same patient, making immunotherapy with many limitations and challenges. Most patients do not respond to immunotherapy or inevitably develop resistance to treatment after a period of treatment, manifesting with primary resistance or acquired resistance who initially respond to treatment. The mechanisms of tumor immune resistance are very complex and involve multiple aspects such as genes, metabolism, inflammation, and abnormal neovascularization. Currently, many mechanisms of immunotherapy resistance have been characterized, and more continue to be uncovered. These efforts can improve the quality of medical care for cancer diagnosis and treatment, which improve the quality of life of patients, and finally lead to accurate individualized treatment. This presentation discusses mechanisms of cancer immunotherapy resistance including tumor-intrinsic factors and tumor-extrinsic factors, and, the dilemmas faced at the Cochin Cancer Research Centre.

Biography

Dr Prem Ravi Varma was the first Medical Oncologist to have worked in Calicut, Kerala State, India and is currently managing the Haematological malignancies and Sarcoma Unit at the Cochin Cancer Research Centre, Ernakulam. He is actively involved in facilitating the interface between basic and applied research, and is an empanelled clinical investigator of several phase II/III trials of novel therapeutic approaches in advanced disease with the Clinical Trials Registry, India.

A Chapel[1]*, A Semont[1], C. Linard[1], N. Mathieu[1], C Demarquay[1], C Squiban[1], J Voswinkel[2], H Rouard[3], JJ Lataillade[5], C. Martinaud[5], M Benderitter[1], NC Gorin[2], JM Simon[4] and M Mothy[2]

[1]Radiological Protection and Human Health Division, Institute of Radiological Protection and Nuclear Safety, Fontenay-aux-Roses, France, [2]Department of Hematology, Saint Antoine Hospital APHP and UPMC University, UMRS 938, Paris, France; 3 Assistance Publique-Hôpitaux de Paris, EFS Ile de France, Banque des Tissus, Creteil, France.
[4]Department of Radiation Oncology, Pitie-Salpetriere University Hospital, Paris, France;
[5]Blood Transfusion Center of Army, Percy Military Hospital, Clamart, France

Stem cell therapy in radiotherapy from bench to clinical trial evaluating the efficacy of mesenchymal stromal cell injections for the treatment of chronic pelvic complications induced by radiation therapy

The late adverse effects of pelvic radiotherapy concern 5 to 10% of patients, which could be life threatening. However, a clear medical consensus concerning the clinical management of such healthy tissue sequelae does not exist. Our group has demonstrated in preclinical animal models that systemic mesenchymal stromal stem cells (MSCs) injection is a promising approach for the medical management of gastrointestinal disorder after irradiation.
In a phase 1 clinical trial, we have shown that the clinical status of four first patients suffering from severe pelvic side effects (Epinal accident) was improved following MSC injection (figure). Two patients revealed a substantiated clinical response for pain and hemorrhage after MSC therapy. The frequency of painful diarrhea diminished from 6/d to 3/d after the first and 2/d after the 2nd MSC injection in one patient. A beginning fistulization process could be stopped in one patient resulting in a stable remission for more than 3 years of follow-up. A modulation of the lymphocyte subsets towards a regulatory pattern and diminution of activated T cells accompanies the clinical response. MSC therapy was effective on pain, diarrhea, hemorrhage, inflammation, fibrosis and limited fistulization. No toxicity was observed. We are now starting a clinical research protocol for patients with post-radiation abdominal and pelvic complications who have not seen their symptoms improve after conventional treatments (NCT02814864, Trial evaluating the efficacy of systemic MSC injections for the treatment of severe and chronic radiotherapy-induced abdomino-pelvic complications refractory to standard therapy (PRISME). It involves the participation of 6 radiotherapy services for the recruitment of 12 patients. They will all be treated and followed up in the hematology department of Saint Antoine Hospital. The cells will be prepared in two production centers (EFS Mondor and CTSA). Treatment is a suspension of allogeneic MSCs. Eligible patients must have a grade greater than 2 for rectoragy or hematuria at inclusion and absence of active cancer. Each patient receives 3 injections of MSCs at 7-day intervals. Patients will be followed up over a 12-month period. The main objective is a decrease of one grade on the LENT SOMA scale for rectorrhagia or hematuria. The secondary objective is to reduce the frequency of diarrhea; analgesic consumption, pain and improved quality of life.

Biography

For 25 years, he has been developing gene and cell therapy using non-human primates, immune-tolerant mice and rats to protect against the side effects of radiation. He collaborates with clinicians to develop strategies for treatment of patients after radiotherapy overexposures. He has participated in the first establishment of proof of concept of the therapeutic efficacy of Mesenchymal stem cells (MSCs) for the treatment of hematopoietic deficit, radiodermatitis and over dosages of radiotherapy. He has contributed to the first reported correction of deficient hematopoiesis in patients (graft failure and aplastic anemia) thanks to intravenous injection of MSCs restoring the bone marrow microenvironment, mandatory to sustain hematopoiesis after total body irradiation. He is scientific investigator of Clinical phase II trial evaluating the efficacy of systemic MSC injections for the treatment of severe and chronic radiotherapy-induced abdomino-pelvic complications refractory to standard therapy (NCT02814864Hirsch Index 29).

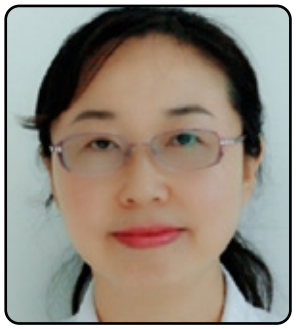
SPEAKERS

DAY 02

INTERNATIONAL CONFERENCE ON

CELL & STEM CELL RESEARCH

16-17 SEPT



Li-Xin Zhang[1]*, Qi-Feng Song[1,2]

[1]Department of Rehabilitation, Shengjing Hospital of China Medical University, China

[2]Intensive Care Unit, Shengjing Hospital of China Medical University, China

Stem cells inhibit ferroptosis after spinal cord injury

Spinal cord injury (SCI) has different aetiologies, complex pathogenesis, and diverse pathological changes. With current treatment effects are not precise, and the prognosis is poor. After SCI, neurons die in various forms. Among them, ferroptosis, is one of important factors causing dysfunction after SCI, and none of the existing traditional treatments have been proven to block its occurrence. Meanwhile, stem cells, specifically mesenchymal stem cells (MSCs), are considered to can direct differentiation into neurons, while also play a role in inhibiting neuroinflammation, inhibiting scarring, stimulating angiogenesis and providing nutritional support. And they are promised for reversing spinal cord neuronal ferroptosis after SCI. However, there is no precise and reliable report on this aspect. Unfortunately, only a few studies on the treatment of neurological diseases that can provide a partial basis for the treatment of ferroptosis by MSCs, almost no studies directly on ferroptosis after SCI. In addition, MSCs could also inhibit various forms of cell death after SCI, including apoptosis, pyroptosis and autophagy. They are supported by corresponding studies. In summary, ferroptosis is an important programmed cell death after SCI, and inhibition of it has been shown to be beneficial to reverse neurological dysfunction after SCI. Meanwhile, stem cells are promising treatments for SCI, which have proven to help reverse adverse outcomes in SCI, and has been shown to have the potential to inhibit ferroptosis after SCI. Overall, this presentation provides a basis, reference and inspiration for future research on stem cells in the treatment of ferroptosis after SCI, inspire further research, ultimately benefit clinical.

Audience Take Away

- To enable the audience to easily grasp the course and characteristics of spinal cord injury, and stimulate the audience's attention to spinal cord injury.
- Audience can get recent studies on ferroptosis after SCI and the mechanism or related pathways of ferroptosis.
- Stem cells are promising treatments for SCI, and have the potential to block ferroptosis in neurons, in order to provide new methods for clinical treatment.
- As there is no direct research on the inhibition of SCI ferroptosis by stem cells until now, this presentation could provides a basis, and inspirate future research.

Biography

Li-Xin Zhang graduated as a Bachelor of clinical medicine at Jinzhou Medical College in 1998, and graduated as a Master in Rehabilitation medicine and physiotherapy and worked as a Rehab doctor in Department of Rehabilitation Medicine, in the 1st Hospital Affiliated to China Medical University. She graduated as a Ph.D of Anatomy in 2008. She worked for Shengjing Hospital of China Medical University since Dec,2010.

Marina Mirchandani-Duque+[1], Miguel A. Barbancho +[1], Alexander Lopez-Salas[1], Jose Erik Alvarez-Contino [1], Natalia Garcia-Casares [1], Kjell Fuxe [2], Dasiel O. Borroto-Escuela [1,2,3] and Manuel Narvaez[1,2]*

[1]Biomedical Research Institute of Malaga, Faculty of Medicine, University of Malaga, Spain
[2]Department of Neuroscience, Karolinska Institute, Sweden
[3]Department of Biomolecular Science, Section of Physiology, University of Urbino, Italy

Stem cell-induced proliferation on the hippocampus after intranasal administration of Galanin receptor 2 and neuropeptide Y1 receptor agonists: Role in spatial memory and depression-like effects in rats

Several neurodegenereative diseases and depression are linked to dysregulation of hippocampal neurogenesis, where boosting hippocampal neurogenesis in these patients emerges as a potential therapeutic approach. Accumulating evidence for Neuropeptide Y (NPY) and galanin (GAL) interaction was shown in various limbic system regions at molecular-, cellular- and behavioral-specific levels. The purpose of the current work was to evaluate the role of NPY and GAL interaction in the neurogenic actions on the dorsal and ventral hippocampus. We studied the Y1R agonist and GAL effects on: hippocampal cell proliferation through the proliferating cell nuclear antigen (PCNA); the expression of neuroprotective and anti-apoptotic factors and the survival of neurons and neurite outgrowth on hippocampal neuronal cells. The functional outcome was evaluated in the object-in-Place task and the forced swimming test. We demonstrated that the Y1R agonist and GAL and promote cell proliferation and the induction of neuroprotective factors. These effects were mediated by the interaction of NPYY1 (Y1R) and GAL2 (GALR2) receptors, which mediate the increased survival and neurites outgrowth observed on neuronal hippocampal cells. These cellular effects are linked to the improved spatial-memory effects after the Y1R agonist and GAL coinjection at 24 hours in the object-in-place task and in the forced swimming test. Our results suggest the development of heterobivalent agonist pharmacophores, targeting Y1R-GALR2 heterocomplexes, therefore acting on the neuronal precursor cells of the DG in the dorsal hippocampus for the novel therapy of neurodegenerative cognitive-affecting and depressive diseases.

Audience Take Away

- Understanding Neuropeptide Y and GAL interaction through Y1R-GALR2 heteroreceptor complex.
- How the the Y1R agonist and GAL may promote cell proliferation in the DG of the dorsal and ventral hippocampus and the induction of neuroprotective factors, such as BDNF and Bcl-2.
- How Y1R-GALR2 heteroreceptor complexes mediate survival and neurites outgrowth on neuronal hippocampal cells.
- How these cellular effects may be linked to spatial-memory and antidepressant effects.
- The development of heterobivalent agonist pharmacophores, targeting Y1R-GALR2 heterocomplexes, therefore acting on the neuronal precursor cells of the DG in the dorsal and ventral hippocampus for the novel therapy of neurodegenerative cognitive-affecting and depressive diseases.

Biography

Manuel Narvaez cursed Medicine and surgery degree in 2005, with the best academic record of his promotion, in 2006 I obtained a competitive pre-doctoral excellence scholarship from the Andalusian board. The research activity developed allowed him to carry out 5 months visits during 2009 and 2010 at the Karolinska Institute in Stockholm to obtain the European mention. In 2012 I obtained the European PhD thesis with cum laude qualification, the extraordinary PhD award from the faculty of medicine, thesis prize from medical college of Malaga (2012) and the prize from college of pharmacists of Malaga (2013). Up to 6 postdoctoral visits to the Karolinska Institute in Stockholm collaborating on multiple research projects establishing collaborative links with the Swedish research group, during the years 2012-2021, total more than 1 year. The research results have been published successively in congresses of international and national relevance. In addition, innovative articles have been published, including in the first quartile of impact index in its category and with quality indices, including high cite numbers. Our team has performed multidisciplinary research and worked in a highly integrative manner at different systems levels, we have contributed to the GPCR receptor-receptor interactions field focus in CNS diseases, such as depression, Parkinson, addiction drugs and Alzheimer.

Lina Hemmeda
Faculty of Medicine, University of Khartoum, Sudan

Knowledge and attitude of Sudanese medical students toward stem cells and their application: A cross-sectional study among Ten Sudanese University

Stem cells (SC) are primitive "non-specialized" cells that divide and renew continuously during early life and growth to form a specific cell or tissue type. One of the major challenges that stem cell transplantation faces is a lack of donors due to a lack of knowledge and awareness of the importance of stem cell transplantation, this implies that health care providers should arm themselves with sufficient knowledge to contribute positively to raising awareness. This is an analytical cross-sectional study of 1040 medical students from ten universities from various Sudanese states, an online self-administered pre-tested and structured questionnaire was formulated by the authors with a particular focus and/or reflection on the knowledge and attitudes of medical students. The median knowledge score among all students was 8.0 (6 – 9) with the majority of students confirming that stem cells are capable of dividing and can self-renew for a long period (88.6%). Regarding attitude, the median score among the participants was 23 (17 – 27) with (47.9%) agreeing that competency in stem cell knowledge is important for them as future health care providers. In terms of ethical attitude; the majority of the students (59, 2%) think there's a need to obtain ethical approval before conducting research. Moreover, (45.9%) of students believe that Health practitioners have the right to use stem cells in treatments if those treatments have been scientifically proven to be effective on animals and on human cells in the laboratory. Some contradiction was found with other studies conducted at different countries, therefore, so further research is needed regarding the influence of religion and society on the attitude of medical students toward stem cells. Moreover, Educational Programs among medical students about all the potentials of stem cells research are recommended to encourage further research about this area.

Audience Take Away

- Giving reflection about medical students knowledge and ethical attitude toward stem cells.
- Open insights into the importance of engaging medical students in the feild of stem cells.
- Presenting an area of intuition about the affects cultu free and religion could play on the beliefs of medical students.
- Present lecturing about stem cells as a solution to fill the students knowledge gap.

Biography

Lina Hemmeda is a fifth year medical student from Sudan. Currently studying at the Faculty of Medicine, University of Khartoum. She is focusing on solution-based actions she found herself melting into leadership and NGOs environment, taking numerous roles as a research and science advocate, and as an activist in evidence based practice. She had over three years of research experience with articles published in pubmed indexed journals.

Prof. Aleksandar Ljubic
[1]Department of Gynaecology and Obstetrics, BioCell Hospital, Belgrade, Serbia
[2]Vincula Biotech Group, Belgrade, Serbia
[3]Dubrovnik International University, Dubrovnik, Croatia

Cell & gene therapy for improving impaired gametogenesis

One of the many infertility causes is impaired gametogenesis. Premature ovarian insufficiency (POI) and azoospermia are among the most frequent causes of female and male infertility, respectively. POI is characterized by deprivation of normal ovarian function due to a decrease in the number of follicles, leading to amenorrhea in 1% of women younger than 40. Azoospermia is characterised by the absence of sperm in a man's ejaculate. The background of these diseases is multifactorial, involving interaction between genes and various non-genetic factors, such as autoimmunity, genital infections, exposure to chemicals, or injuries to the genital tract.

Although significant improvements in infertility management with Assisted Reproductive Technologies (ARTs) have been made, certain conditions do not respond appropriately to the existing treatments. Regenerative medicine, as an innovative therapeutic approach, appears as a promising solution either as the first choice in infertility treatment or as an adjunct therapy.

Cell-based therapy involves autologous or allogenic products, such as platelet-rich plasma (PRP) and mesenchymal stem cells (MSCs). PRP is highly concentrated plasma enriched with platelets containing many growth factors and inflammation mediators. The activation of these molecules modulates cell proliferation, tissue remodelling, angiogenesis, and inflammatory response. MSCs are adult stem cells that originate from mesoderm and, in addition to their ability to self-renew, they can differentiate into a variety of other cell types. They achieve their effect mainly through secreting molecules in free form or in the form of extracellular vesicles – MSCs-derived exosomes. These substances support the microenvironment and encourage the proliferation of existing progenitor cells. Hence, MSCs could revive folliculogenesis, activate dormant follicles and stimulate steroidogenesis. In the testes, the bioactive molecules released by MSCs may provide additional support for Sertoli cells and enable adequate spermatogenesis.

Moreover, combining ARTs techniques and biological therapy may lead to advancements in infertility treatment. In vitro maturation (IVM) is an experimental method gradually introduced into clinical practice. The supplementation of IVM mediums with PRP may increase the oocyte developmental competence and subsequently enhance the fertilization and pregnancy rates, which is an option for women who are not candidates for conventional IVF.

With the development of gene therapy, many conditions with a genetic basis are becoming treatable. Cell&Gene therapies represent an even more progressive therapeutic approach, consisting of cell isolation, repair of defective genes via a gene editing system, usually CRISPR-Cas9, and reinjection into the patient. However, these therapies have been used in experimental settings so far.

In summary, regenerative medicine represents a novel therapeutic strategy that aims for future research due to its enormous potential to cure the disease and improve the overall quality of life.

Audience Take Away

- The audience will be introduced to the core idea of regenerative medicine and its main therapeutic strategies.
- A novel insight into infertility causes and innovative ways of treatment.
- The future of biotechnology and highly personalized, patient-oriented medicine.

Biography

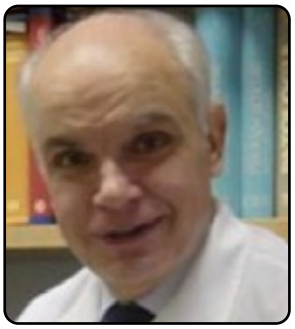
Professor Aleksandar Ljubic, MD, PhD, is a gynaecologist recognized for his expertise in reproductive medicine and high-risk pregnancies. He was educated at the Faculty of Medicine, University of Belgrade, with postgraduate education in the USA, Japan, UK and Greece. He was the lead investigator in 12 national and international scientific projects and published more than 500 publications, with an overall citation number – of 1222 and a Hi-index of 18. Professor's recent research areas include reproductive and perinatal biotechnology and assisted reproduction. He created the SEGOVA and SEMPRE RB programs for ovarian rejuvenation and longevity, respectively. He is the president of the supervisory board and cofounder of Vincula Biotech Group and BioCell Hospital.

Ravi Kumar Chittoria
Sri Venkateswara Institute of Medical Sciences (SVIMS) University, India

Guidelines for burns dressings

Aims & Objectives: To review international & national guidelines for burns dressings.
Introduction: A Dressing is defined as a clean or sterile material applied directly to wounded or diseased tissue to absorb secretions, protect from trauma, administer medications, maintain wound cleanliness, or stop bleeding.[1] Guidelines are required to choose dressing on scientific basis, evidence based, avoiding bias in selection, preventing commercial misuse of dressing products, educate & guide burns care givers.[2-5] History to current practice of use of regenerative medicine is discussed.
Materials & Methods: Cochrane & literature search-based review of articles on guidelines for burns dressings are done to arrive at conclusion for burns care providers.
Results: A Summary and conclusion was arrived.
Conclusion: To avoid personal bias and use burns dressing scientifically & evidence based, it's necessary to know various international & national guidelines.

Biography
Ravi Kumar Chittoria: Born & brought up in New Delhi, India. Completed Graduation (MBBS) & Postgraduation (MS in General Surgery and MCh & PhD in Plastic Surgery) in India. Underwent Higher Training in Laser Surgery, Endoscopic Plastic Surgery, Aesthetic Surgery from USA and Training in Mesotherapy, Fillers from France. Received 9 Fellowships including Fellowship from Royal College of Surgeons of Edinburgh (FRCS-Ed). Has been Awarded 47 Awards including Oscar of Medicine International BMJ Award.



Giuseppe Scalabrino
Department of Biomedical Sciences for Health, University of Milan, Italy

The CNS EGF lack in multiple sclerosis: A new aspect of its pathogenesis and an impediment to development of the endogeneous neural stem cells

Our recent findings showing that epidermal growth factor (EGF) is significantly decreased in the cerebrospinal fluid (CSF) and spinal cord (SC) of living or deceased multiple sclerosis (MS) patients, and that its repeated administration to mice with experimental allergic encephalomyelitis (EAE)-induced demyelination of their central nervous system (CNS) prevents demyelination and inflammatory reactions in their CNS, have led to a critical reassessment of the MS pathogenesis. Indeed, EGF is considered to have little or no role in immunology. EGF is the only CNS-myelinotrophic factor that has been tested in the CSF and SC of MS patients, and it has been shown that there is a good correspondence between liquid and tissue levels. Moreover, EGF administration has been shown by other authors to be effective in CNS remyelination in experimental models of chemically-or virally-induced CNS demyelination. Here, the positive EGF effects on neural stem cells, oligodendrocyte cell lineage, and astrocytes are briefly summarised, in order to explain, at least in part, the biological basis of the remyelination failure in MS. Neural stem cells are distributed in different CNS areas, serve as a reservoir of multipotent cells, and may be increased by different means during CNS demyelinating deseases. Furthermore, after a short analysis of the evolution of the principle of cause-effect in the history of Western philosophy, the lack of any experimental immune-, toxin-, or virus-mediated model that precisely reproduces the histopathological features and *clinical* symptoms of MS is highlighted, thus underlining the inapplicability of Claude Bernard's crucial sequence of «observation →hypothesis→hypothesis testing». This is followed by a discussion of most of the putative non-immunologically-linked points of MS pathogenesis (e.g., abnormalities in myelinotrophic factor CSF levels, oligodendrocytes (ODCs), astrocytes, CNS myelin composition, and epigenetics) on the basis of Popper's falsification principle, and the suggestion that autoimmunity and phlogosis reactions (surely the most devasting consequences of the disease) are probably the last links in a chain of events that trigger the reactions. Given that myelinogenesis is controlled by various CNS and extra-CNS growth factors and other molecules within and outside ODCs, it is likely that there is a lack of other myelinotrophic growth factors in MS CNS. The autoimmune reaction as the cornerstone of the MS pathogenesis seems to be fading and it seems to be the consequence rather than the cause of the disease.

Audience Take Away

- The EGF role in the pathogenesis of remyelination failure is interesting and innovative.
- New results will support the notion the EGF lack is crucial in remyelination failure in MS.
- Other faculty could use this research to expand their research or teaching.

Biography

- **1968**: M.D. degree, University of Milan.
- **1979**: Speaker at the meeting on "Polyamines and Neoplastic Growth" at the Gordon Conference on Polyamines in Andover, NH (USA).
- **1986-2014**: Professor of General Pathology, University of Milan.
- **1993**: Speaker at the International Symposium "Thomas Addison and Its Diseases: 200 Years on", London

- **1996**: Chairman at the Tokyo International Symposium on Polyamines
- **2005:** Speaker at the Gordon Research Conference on "Vitamin B_{12} and Corphins", Oxford

Interest in Dr. Scalabrino's research has been demonstrated by a "critical review" published in *Nutr. Rev.* **60**, 142-144, 2002 by Dr. J.W. Miller. The Scalabrino's research has been mentioned in different textbooks of neurology, haematology, and biochemistry.

Misba Majood
Amity Institute of Click Chemistry Research and Studies, Amity University, India

Identifying the function of nanoparticles in stem cell differentiation

New doors have been opened in the fields of regenerative medicine and tissue engineering because of recent developments in nanotechnology and the applications of this technology. It is a relatively new field that has the potential to improve the therapies and differentiation of stem cells. According to the findings of several research, these nanomaterials can simulate the physiological niche that is necessary for the proliferation and differentiation of stem cells. However, in the field of regenerative medicine, carbon-based nanoparticles have been found to offer enormous promise in comparison to the other nanomaterials that have been discovered to this day. The majority of the research that has been done up until this point has mostly been on tracking and visualising stem cells utilising nanomaterials. However, the relationship between these cells and stem cells, as well as the potential associated with directing molecular signals for differentiation, is not investigated very thoroughly. In addition, research that is specifically geared toward identifying an optimum CNM source and formulation, such as quantum dots or scaffolds, that can offer cues for stem cell and their lineage development is not known to exist. Consequently, I will try to explain some of these well-known CNM sources and how they might be used in regenerative medicine.

Audience Take Away

- I will be briefing them about the various carbon-based nanomaterials used in cell biology.
- I will also tell them about various methods for nanomaterial preparation.
- Lastly, I will be focusing of the use of these nanoparticles in regenerative medicine and tissue engineering.

Biography

Misba Majood is a Ph.D. scholar at Amity Institue of Click Chemistry Research and Studies, Amity University Uttar Pradesh. She did her B.Tech & M.Tech in Biotechnology from Amity Institue of Biotechnology, Amity University Uttar Pradesh. Currently, her research is focused on carbon-based nanomaterials or nanocomposites for stem cell proliferation and differentiation. So far, she has published 2 research articles and 2 reviews in reputed journals.

Suada Tinjic
Private Clinic, Step to life, Bosnia and Herzegowina

The influence of autologous in vitro activation of Ovaries by stem cells and growth factors on endocrine and reproductive function of patients with ovarian insufficiency

Introduction: Premature ovarian failure (POF) occurs in 1% of women, in age 35-40, mostlyof unknown cause, and leads to reduction or loss of female reproductive function. Many factors cause the interruption of the Hippo signaling pathway and the termination of follicular growth resulting in the onset of amenorrhea and menopause. The pathway of phosphatidylinositol-3-kinase / protein kinase B (PI3K-Akt) plays a key role in cellular responses to cell proliferation. PI3K-Akt signaling is associated with ovarian function, growthof primordial follicles, yellow body survival and oocyte maturation.

Materials and methods: The SEGOVA method (therapy with autologous concentrated growth factors and autologous stem cells and in vitro activation of the tissue of the ovaries)acts on the described intracellular signaling system.

The study included 50 patients, 30 to 50 years of age, with a diagnosis of POF and infertility.The study was performed at Jevremova Special Hospital in Belgrade, Saint JamesHospital in Malta, and RemedicaSkoplje Hospital, between 2015-2018.

Aim: The goals of longitudinal prospective observational study were:

1. To investigate the blood levels of FSH, LH, progesterone and estradiol before and 3,6, and 12 months after the procedure of in vitro activated ovarian tissue.
2. To investigate if the volume of retransplanted activated ovarian tissue affected thelevels of FSH, LH, progesterone, and estradiol hormones.
3. To investigate if the volume of the bone marrow and total nucleated cell count takenbefore the treatment correlated with hormone level at 3, 6, and 12 months after the treatment.
4. To investigate the effects of in vitro ovarian activation on reproductive function,follicle count, number and quality of aspirated cells, and number of embryos.

Results: The sample of 50 patients monitored over 12 months exhibited that SEGOVA has apositive effect on the endocrine status and the reproductive outcome of patients. Out of all patients, 64% (32 of 50) had follicles present.Out of 32 patients who had follicles, 25% had oocytes (8 of 32). The fertilization rate of the aspirated oocytes was 75%(6 of 8), resulting in embryos.

Embryo transfers were performed in 66,67% embryo positive women (4 of 6), while 50% ofembryo positive women (3 of 6) had vitrified embryos.

Out of all patients who had embryo transfer, 75% (3 of 4) resulted in successful pregnancies, which is 6% of total number of patients (3 of 50). Two patients spontaneously conceived aftertransplantation and one pregnancy was conceived with IVF. Three pregnancies resulted in thesuccessful birth of 4 newborns (one twin pregnancy). Therearestill 10 vitrified embryos left. The levels of FSH, LH, and Progesterone show significant decrease, and estradiol increase, 12months after the procedure.

Conclusion: The application of the SEGOVA method in the future could solve many problems in human reproduction due to a large number of patients diagnosed with POF, as well as the possibility of delaying menopause, thus improving the quality of life and generalhealth.

Biography

Work Experience: Gynecological Polyclinic "A step to life" Medical Doctor & Owner 2005 - Present (17 years), Ian Donald - School of Medical Ultrasound Managing Director & Educator 2016 - Present (6 years), University Clinical Center Tuzla Medical Doctor, Gynecology and Obstetrics 1993 - 2005 (12 years)

Education and training: Sarajevo School of Science and Technology Doctor of Philosophy – Regenerative Medicine and Human Reproduction (2018 - 2021), Ian Donald Inter - University School of Medical Ultrasound Master's degree, Human Reproduction, Reproductive Endocrinology, Infertility (2016 - 2017), University Clinical Center, Tuzla - Specialisation in Gynecology and Obstetrics (1997 - 2002), Medical University, Tuzla (Bosnia and Herzegovina) - Medical Doctor (1987 - 1992)

Khatereh Khorsandi*

1-Department of Photodynamic, Medical Laser Research Center, Yara Institute, ACECR, Iran
2-Department of Biochemistry and Molecular Medicine, School of Medicine and Health Sciences, The George Washington University, USA

Biological responses of stem cells to photobiomodulation therapy

Stem cells have attracted the researcher's interest, due to their applications in regenerative medicine. Their self-renewal capacity for multipotent differentiation, and immunomodulatory properties make them unique to significantly contribute to tissue repair and regeneration applications. Recently, stem cells have shown increased proliferation and, in some cases, differentiation when irradiated with low-level laser therapy or Photobiomodulation Therapy (PBMT), which induces the activation of intracellular and extracellular chromophores and the initiation of cellular signalling.
Studies demonstrated that red to near-infrared light is absorbed by the mitochondrial respiratory chain. Mitochondria are significant sources of reactive oxygen species (ROS). Mitochondria play an important role in metabolism, energy generation, and are also involved in mediating the effects induced by PBMT. PBMT may result in the increased production of (ROS), nitric oxide (NO), adenosine triphosphate (ATP), and cyclic adenosine monophosphate (cAMP). These changes, in turn, initiate cell proliferation and induce the signal cascade effect.
The findings of various studies suggest that PBMT-based regenerative medicine could be a useful approach for future advances in tissue engineering and cell therapy.

Audience Take Away

- Regenerative medicine and stem cell therapy have the potential to provide diseases-free, functional tissues and organs, and improving the quality of life for patients.
- Combined innovative new therapies such as stem cell therapies and LLLT/photobiomodulation are necessary for regenerative medicine.
- LLLT -based regenerative medicine could be a useful tool for future advances in tissue engineering and cell therapy.

Biography

Dr. Khatereh Khorsandi (Ph.D in Biochemistry) is working as faculty member (Assistant Professor) and head of Photodynamic Department at Medical Laser Research Center, YARA Institute, ACECR, Tehran University of medical sciences (TUMS) branch, Tehran, IRAN. She is postdoctoral scientist at George Washington University, Washington DC, USA, TOO. Her research interests include Photodynamic Therapy, Photobiomodulation, Photodynamic inactivation, cancer treatment and wound healing. She is the recipient of FAOBMB, IUBMB, ESP and IUPAB young scientist fellowship awards of 2016, 2018, 2019 and 2020-2021 years, respectively. She has published more than 60 research and review articles on the recognized international peer review journal and has invited as keynote speaker in international congresses.

Tita Husnitawati Madji
Department of Obstetric and Gynecology, Padjadjaran University, Indonesia

New insight of non-invasive diagnosis in endometriosis

This presentation will discuss alternative methods in determining the diagnosis of endometriosis using non-invasive methods. Detection of endometriosis using immunocytochemistry of P450 Aromatase expressions in eutopic endometrial cells obtained from menstrual sloughing: a diagnostic study can provide a solution and alternative non-invasive method for diagnosing endometriosis by isolating endometrial cells that have stem cell/progenitor properties taken through blood menstruation in endometriosis patients. This research aimed to explore the possibility of a new diagnostic approach of endometriosis based on immunocytochemistry scoring of Aromatase P450 expressions in endometrial cells collected from menstrual sloughing. In this research The P450 Aromatase expression in endometrial cells of women with endometriosis was significantly stronger than without one. The cut-off point of H-scores to detect endometriosis was > 4. By this criteria, H-score had 94.6% sensitivity, 90.9% specificity, 92% positive predictive value and 93% negative predictive value. Immuno- cytochemistry scoring of Aromatase P450 expression in endometrial cells (ICAPEC) derived from menstrual blood specimen was a good candidate as alternatives approach in diagnostic procedure of endometriosis. Application and evaluation in clinical practice would provide the economically benefit in diagnostic procedure. This research can provide solutions to facilitate the diagnosis of endometriosis, its more simple and non-invasif and it gives benefit for patient who has doubt with invasif or surgery procedure.

Audience Take Away

- From this research, the audience can learn a way how to easily isolate endometrial cells that have stemcell/progenitor properties.
- This method can help practitioners in their daily work in the field to quickly diagnose endometriosis (adenimiosis) and even diagnose this disease earlier before anatomical abnormalities occur.
- This research can be carried out in its faculties and laboratories (histopathology) with the aim of developing research and of course can be used as teaching materials.
- This research can provide solutions for designers to make it easier, simplify and make more efficient in their work to design.
- Can improve design accuracy or become a new source of information to help solve design problems.
- It is a non-invasive method in diagnosing endometriosis. Can diagnose disease early. The method of diagnosis is safe, fast, relatively affordable and more widely accepted by patients. Don't be afraid because of the surgical procedure. Prevent complications of diseases that are difficult or not easy to overcome, including: pelvic pain, organ distortion, infertility and even malignancy.

Biography

Dr. Tita Husnitawati Madjid at the Padjadjaran University, Indonesia graduated as Medical Doctor in 1984 and then she graduated as an OB-GYN in 1994. She then joins a fellowship program and graduated as a Fertiity and Edoncrinology Reproduction consultant in 2001. She received her PhD degree in 2009 at the same institution. She's an associated professor and has published 75 journals.

Salwa Abdel Tawab*, Sahar M. M. Omar, Asmaa A. Abo Zeid* Caroline Saba***
*Histology and Cell Biology Department, Faculty of Medicine, Ain Shams University, Cairo, Egypt

Role of adipose tissue-derived stem cells versus differentiated schwann-like cells transplantation on the regeneration of crushed sciatic nerve in rats. A histological study

Background & objectives: Despite surgical advances, recovery of peripheral nerve injuries has often been poor, leading to irreversible impairment. This study aimed to differentiate adipose-derived stem cells (ASCs) into Schwann-like cells (SCs) in vitro and assess their role versus the undifferentiated ASCs in the regeneration of crushed sciatic nerves in adult male albino rats.

Materials & Methods: We performed a simple and less costly method to differentiate ASCs into SCs. Forty rats, weighing 200-250 g, were randomly divided to 4 equal groups. Group I (control) subjected to sham operation. Group II subjected to crush injury of the sciatic nerve. Group III subjected to crush injury with local transplantation of ASCs. Group IV subjected to crush injury with local transplantation of differentiated Schwann-like cells. The rats were sacrificed 4 weeks later. We studied the nerves using H&E and Masson's Trichrome stain. Immuno-histochemical studies using S-100 and neurofilament-H (NF-H), together with morphometric and statistical studies were done.

Results: Differentiated Schwann-like cells adopted a spindle-like morphology and 87.9% of the cells became GFAP positive and 90.4% were positive to S-100. Group II showed thin discontinuous nerve fibers with proliferation of SCs. Significant increase in collagen area percentage, and significant decrease in S-100 & NF-H immune reaction was noted as well. Group IV revealed better regeneration of axons, and higher intensity of immune reaction by S-100& NF-H, than Group III. Meanwhile, both Groups III & IV showed thicker, more packed nerve fibers with significant decrease in collagen area percentage compared to Group II.

Conclusion: Our results suggested that differentiated Schwann-like cells might have a more beneficial role than ASCs, for treatment of peripheral nerve injuries.

Audience Take Away

- Other faculty could use to expand their research or teaching.
- This article provides hope for many neurological conditions that can never be cured without the application of stem cells.

Biography

Dr.Sahar M.M. Omar now is a professor doctor at Ain Shams University and Armed Forces College of Medicine. She earned her B.Sc. in medicine, M.Sc.& Ph.D. in Histology & cell biology at Ain Shams University from 2000 to 2005. Dr. Sahar attended the BIT's 10th World Congress of Regenerative Medicine & Stem Cells -2016 in China and gave a talk titled as "Bone Marrow Mesenchymal Stem Cell Transplantation in a Rabbit Corneal Alkali Burn Model."Dr. Sahar possessed a strong publication record; she published a minireview titled"Superior Proliferative and Tissue Regeneration Potential of AdiposeTissue-Derived Mesenchymal Stem Cells Compared to BoneMarrow. It was published in Insights of stem cell journal Vol.1 No.1:7 (2015)http://stemcells.imedpub.com/. Dr. Sahar also published a minireview titled: Mesenchymal Stem Cells for Treating Ocular Surface Diseases in journal of stem cell research J Stem Cell Res. 2017; 1(1): 1-6.

Dr. Sahar is Board reviewer in Journal of Stem Cell Research and Medicine (JSCRM https:// www.cmepub.com/journals/stem-cell-research-home). And Editorial board: Journal of Stem Cells and Genetics Open Access. Associate editor in Journal of Stem Cell Research and therapeutics. https:// medcraveonlines.com/JSRT/editorial board

Xuanhua Peter Xie
MSKCC, United States

Heterogeneity of Glioblastoma and enrichment of stem-like cells upon transplantation, chemotherapeutics, and recurrence

Though a rare form of cancer, glioblastoma multiforme (GBM) is a deadly disease with five-year survival rate less than 7%. Despite technological advancements, the tumor inevitably recurs. The concept of "cancer stem cells" has been proposed as one explanation for treatment failure. However, even among supporters, consensus about the properties of these cells has not been reached. Fueled by recent single-cell RNA sequencing studies, cells with different characteristics have been proposed to be responsible for recurrence. We designed and validated a novel mouse model to label neural stem cells, which can be transformed and traced as the GBM cell of origin and conserved as stem-like quiescent cells in full-blown tumors. This model allowed for accurate labeling, isolation, and investigation of quiescent cancer stem cells, which resulted in a transcriptional signature to define these cells. Applying the signature to orthotopic human patient-derived xenografts (PDX) uncovered a quiescent cognate population of cells. Differential gene analysis (DEG) of the different cell populations derived from eight human glioblastoma samples generated lists of signature genes differentially expressed in the different cell types, including a quiescent cancer stem cell population. Further analyses showed that human glioblastoma stem cells are enriched upon serial transplantation, chemotherapeutics, and recurrence, emphasizing the importance of including these cells in future therapeutics.

Biography

Dr. Xie received a Bachelor's degree in biochemical engineering at Shanghai University. He then went to Fudan University to study the origin and migration of people residing in East Asia and received a Master's degree. His Ph.D. thesis focused on developmental biology using the Drosophila fly as a model system. With this broad background in life science, he is capable of studying complex brain tumors as a developmental disease from an evolutionary perspective. The major obstacle in glioma treatment is the adaptation of tumor cells to therapeutic intervention and recurrence. Cancer stem cells have been proposed to play a critical role in this process. As a developmental biologist, Dr. Xie decided to examine cancer stem cells during tumor initiation, development, and recurrence to reveal their vulnerability. This strategy prompted him to design a new tool to trace them during the whole spectrum of tumorigenesis, which resulted in the identification, isolation, and characterization of glioma stem cells both in mice and humans. The spontaneous mouse glioma model he produced is ideal for the functioning investigation of candidate genes derived from the cancer stem cell signature or clinical trials. Except for the contributions to glioma stem cell studies, He also collaborated to identify cancer stem cells in malignant peripheral nerve sheath tumors (MPNST). His works paved the basis for designing novel therapeutics for both glioma and MPNST.

Viral Pravin Maru
Associate Professor, Government Dental College & Hospital, India

MSCs based strategies in dentistry: A paradigm shift in tissue regeneration

The use of mesenchymal stem cells (MSC) in regenerative therapeutic techniques is gaining importance in the field of dental medicine. Since the first separation of MSC generated from dental tissue, there has been extensive research into the properties and potentials of these cells in regenerative dentistry. Their ability for multidifferentiation, capacity for self-renewal, and accessibility offer them a central role in stem cell-based therapy. Several distinct forms of dental stem cells have been identified so far, and their potential applications exist in the majority of major dental medical specialties. These cells are also the subject of research in numerous medical disciplines for the treatment of degenerative and inflammatory disorders. The present review discusses the sources of dental MSCs and examines their various applications.

Audience Take Away

- This presentation will give a scoping review on mesenchymal stem cells – its origin, method of isolation, characterization and differentiation capacity and how it could be a boon in regenerative procedures.
- This presentation will highlight the advance approaches involving stem cells and how it can overcome the limitations of conventional therapeutic procedures.
- This presentation will give confidence to various clinicians to involve various stem cell based therapeutic practices.

Biography

Dr Viral Maru is one of the leading pediatric Practioner in Mumbai, India. He has valuable 12 years of academic experience and has keen interest in stem cell-based research therapies. He has several national and international publications on stem cells and its application in various regenerative procedures.

Muhammad Irfan, Ji Hyun Kim, Seung Chung*
Department of Oral Biology, University of Illinois Chicago, Chicago, IL, USA

Engineering dental pulp stem cells in inferior alveolar nerve and dentin regeneration

Stem cell engineering is one of the recent advances in regenerative medicine. Stem cells that can differentiate into a variety of cells or secrete regeneration factors to promote regeneration are an alternative and essential candidate for regeneration therapy. Dental pulp stem cells (DPSC) are derived from neural crest which could give rise to glia and/or neurons due to their similarities to the neuronal cells and strong expression of neuronal markers, suggesting that DPSCs could actively adapt to the neuronal environment. Our data demonstrate that adjusting the microenvironments during DPSC differentiation by hypoxia, cell-to-cell contact and modification of the receptor/intracellular signaling significantly enhanced the regenerative capacity of the differentiated cells. We apply our engineered DPSCs in inferior alveolar nerve and dentin regeneration using our transgenic mouse model. The scientific data obtained from this project will provide a foundation for creating therapeutic tools that target DPSC for peripheral nerve and dentin-pulp complex regeneration.

Audience Take Away

- Explain how the audience will be able to use what they learn?
- Novel information regarding stem cell engineering.
- New information about the superiority of dental pulp stem cells vs bone marrow-derived mesenchymal stem cells in neural regeneration.
- How will this help the audience in their job?
- Is this research that other faculty could use to expand their research or teaching?
- Does this provide a practical solution to a problem that could simplify or make a designer's job more efficient?
- Will it improve the accuracy of a design, or provide new information to assist in a design problem?
- List all other benefits.

Biography

Dr. Chung studied Veterinary Medicine and Histology at the Chungnam National University, South Korea and graduated as DVM/MS in 2003. He then joined the research group of Prof. Richard Hawkes at the University of Calgary, Canada. He received his PhD degree in Neuroscience in 2008 at the same institution. After five years of postdoctoral fellowship supervised by Dr. Wenbin Deng at the University of California Davis, USA, he obtained the tenured position of an Associate Professor at the University of Illinois Chicago. He has published more than 50 research articles.

Alexander Pedroza-Gonzalez
National Autonomous University of Mexico (UNAM), Mexico

Human tumor-infiltrating mesenchymal stromal cells favor tumor progression

Cancer is a group of complex diseases caused by multiple factors. Tumor development depends on several issues including the type of cell affected, DNA alterations, the cell microenvironment, and very importantly of the capacity of immune responses to detect and eliminate the transformed cells. The tumor microenvironment (TME) is an orchestrated network of cells and molecules interacting with each other, it includes tumor cells, cancer-initiating cells or cancer stem cells, stroma cells like fibroblast and mesenchymal stromal cells, associated tissue cells, and infiltrating immune cells. It exerts a key influence on tumor progression and immune function. Among the factors that affect the antitumor response are immunoregulatory molecules and cytokines secreted by tumor cells, but also by stromal cells. Mesenchymal stromal cells (MSC) present in the TME have a very noticeable impact on cancer-associated immunosuppression. Multiple mechanisms have been characterized in animal models, but there is still very little information on humans. In our group, we have analyzed the presence and regulatory function of MSC in tumors of cancer patients and we have observed that they are present from early stages, and they can promote tumor growth by secreting soluble factors that induce upregulation of cell growth and proliferation-related processes and downregulation of cell death-related pathways in cancer cells. They also can inhibit immune function by direct contact through molecules such as PDL1 facilitating tumor development.

Biography

Dr. Alexander Pedroza-Gonzalez completed his master's and doctoral studies in immunology in Mexico City. Later he did a postdoctoral stay at the Baylor Institute for immunology research under the mentorship of Dr. Jaques Banchereau and Dr. Karolina Palucka where he began to work in the area of cancer immunology. Later he was a junior researcher for 5 years in the hepatology and gastroenterology department of the Erasmus MC in Rotterdam, the Netherlands, where he carried out various studies on the immune response in liver cancer. He is currently a researcher at the School of Higher Studies Iztacala (FESI) of the National Autonomous University of Mexico (UNAM).

Participants List

UPCOMING CONFERENCES

2nd Edition of International Conference on
Cell & Stem Cell Research
August 21-23, 2023 at London, UK
https://stemcells.magnusconferences.com/

3rd Edition of International Conference on
Tissue Engineering and Regenerative Medicine
August 21-23, 2023 at London, UK
https://magnusconferences.com/tissue-engineering/index.php

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