

2<sup>nd</sup> International Conference on  
**STEM CELLS AND REGENERATIVE  
MEDICINE**  
May 20-21, 2019 | Rome, Italy

STEM CELL CONGRESS 2019



**SCIENTIFIC TRACKS & ABSTRACTS  
DAY 1**

# DAY 1 SESSIONS

## MAY 20, 2019

Stem Cells | Tissue Engineering & Regenerative Medicine | Anxiety | Cardiac Function | Behavioral Science | Cancer Stem Cells | Stem cell Therapy and Applications

### SESSION CHAIR

**E Mohandas**  
Sun Medical & Research Centre, India

### SESSION CO-CHAIR

**Paolo Scapellato**  
European University of Rome, Italy

## SESSION INTRODUCTION

- Title:** CD98hc is a candidate of cancer stem cell markers in HNSCC  
**Yohei Kawasaki**, Akita University Graduate School of Medicine, Japan
- Title:** Protective effect of *Danggui (Radix Angelicae Sinesis)* with rADSCs cotreatment induce cardiac function in SHR model  
**Parthasarathi Barik**, China Medical University, Taiwan
- Title:** Promising future of stem cells-based treatments in reproductive medicine: In house experience of IVF clinic  
**Nayana Patel**, Akanksha Hospital and Research Institute, India
- Title:** The use of improved traditional GMP manufacturing techniques contributes to the success of large scale State-of-the-Art production of EMA-approved cartilage substitute  
**Marco Fadda**, Comecer SPA, Italy
- Title:** Hoffa's fat key to unlock cartilage regeneration  
**Radhesh R Menon**, K S Hegde Hospital, India

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Yohei Kawasaki et al., Adv Cell Sci Mut. 2019, Volume 3

## CD98HC IS A CANDIDATE OF CANCER STEM CELL MARKERS IN HNSCC

Yohei Kawasaki<sup>1</sup> and Yasufumi Omori<sup>2</sup>

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<sup>2</sup>Department of Molecular and Tumor Pathology, Akita University Graduate School of Medicine, Japan

When head and neck squamous cell carcinomas (HNSCC) are treated with radiation therapy, chemotherapy and surgical therapy, author often encounter their recurrence and distant metastases. Cancer stem cells (CSCs) tend to be resistant to radiation therapy and are therefore, profoundly involved in tumor recurrence and metastasis. Identification of reliable markers of CSCs should lead to the development of a new therapy and contribute to improvement of the survival rate. Recently, Sanne *et al.* have reported that CD98 is one of CSC markers in HNSCC. Moreover, the overexpression of CD98hc is highly associated with different cancers including the colon cancer and renal cancer. CD98 is a heterodimeric protein that comprises a heavy chain and a light chain. The CD98 heavy chain is type II linkage to one of six amino acid transporters. Hence, they investigated the characters of CD98hc-positive and CD98hc-negative cells in HNSCC cell lines and found that CD98hc-positive cells had the potential of CSCs. It is strongly suggested that the therapy targeting to CD98hc should contribute to eradication of HNSCC.

## BIOGRAPHY

Yohei Kawasaki is currently working as a Lecturer at the Department of Otorhinolaryngology, Head and Neck Surgery, Akita University Graduate School of Medicine, Japan.

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Parthasarathi Barik et al., Adv Cell Sci Mut. 2019, Volume 3

## PROTECTIVE EFFECT OF *DANGGUI (RADIX ANGELICAE SINENSIS)* WITH RADSCS CO-TREATMENT INDUCE CARDIAC FUNCTION IN SHR MODEL

Parthasarathi Barik<sup>1</sup>, Shibu M A<sup>1</sup>, T-S Chen<sup>2</sup>, Wei-Wan Kuo<sup>3</sup> and Chih-yang Huang<sup>1,4,5,6,7</sup>

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Hypertension is one of the leading causes of cardiovascular disease associated mortality. At present treatments used to control hypertension and its comorbidities do not exhibit satisfactory effects. Enhancing stem cell associated recovery function is one of the possible approaches to treat hypertension associated damages. Several strategies are used to enhance the regenerative benefits of endogenous as well as transplanted stem cells in treating cardiovascular diseases. In this respect, traditional Chinese medicine which is a primitive approach in treating various pathological problems attracts convincing interest. Root extract from *Danggui* with vasodilatory effects has been used as a traditional Chinese medicine (TCM) to regulate blood flow as well as to treat myocardial ischemic injury. This study evaluates the effect of *Danggui* in potentiating and complementing the effects of transplanted rat adipose derived stem cells (rADSCs) to regulate cardiac damages and to improve cardiac function in spontaneously hypertensive rats (SHR). SHRs with abnormal cardiac contractile function and apoptosis of the heart cells didn't show any significant change with tail vein treatment of rADSCs. However, in SHRs with rADSCs and orally administered *Danggui* the ejection fraction was reverted to that of the control and the apoptotic rates were significantly reduced. *In vitro* analysis also shows that *Danggui* treatment enhanced the survival of rADSCs. The novel study first time demonstrates that only stem cell transplantation in hypertensive condition doesn't improve cardiac function however, combined treatment of *Danggui* and rADSCs induce cell survival as well as improve cardiac function in both *in vitro* and *in vivo* model. The previous report from our lab shows that *Danggui* induces cell survival in cardiomyocytes. Further to verify in animal model, we found that combination treatment induces the cardiac function by properly regulating its ejection fraction and fractional shortening in SHR model, which can be used for regenerative medicine.

## BIOGRAPHY

Parthasarathi Barik is pursuing his PhD at China Medical University, Taiwan. Earlier, he worked as a project fellow at CSIR Labs, India. He has published three papers and two more papers in international journals. He also presented few papers in the conferences and also contributed the research articles to conference proceedings. Currently he is working in rat adipose derived stem cells (rADSCs) and their therapeutic approach in various pathological problems with traditional Chinese drugs. He is also good in experimental works in laboratory along with related software exposures. Apart from his scientific credential he is very much active in the academic capacity building and human resource development where he discussed and helped the college students for the better understanding of life sciences. He also got a position in Physics Olympiad in national level.

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Nayana Patel, Adv Cell Sci Mut. 2019, Volume 3

## PROMISING FUTURE OF STEM CELLS-BASED TREATMENTS IN REPRODUCTIVE MEDICINE: IN HOUSE EXPERIENCE OF IVF CLINIC

### Nayana Patel

Akanksha Hospital and Research Institute, India

Stem cells-based therapy has emerged as one of the most promising approaches for the management of various intractable disorders. Recently the role of adult autologous stem cells has showed its effectiveness in many chronic and incurable diseases such as myocardial infraction, cancer and Type II diabetes. However, compared to the above chronic conditions, the role of stem cells in reproductive disorders such as azoospermia, endometriosis and ovarian failure remains largely unexplored. Some studies have shown a potential role of bone marrow derived stem cells (BMSCs) in reproductive medicine. Our studies on bone marrow derived stem cells as bone marrow concentrate (BMCs) for the treatment of ovarian rejuvenation, testicular rejuvenation and thin endometrium lining regeneration have shown its potential in improving these conditions. For example, author found that the application of BMCs improved the testicular functioning in terms of total number of sperm its motility and the quantity of semen in patients with severe azoospermia, thus showing its potential in spermatogenesis. Furthermore, BMCs with platelet rich plasma (PRP) improved the lining of endometrium in patients with thin endometrium. What's more, it has helped in the implantation of embryos in patients having recurrent implantation failure. Finally, they discovered that ovarian rejuvenation with BMCs also improved the total number of eggs and its quality. All together, these results indirectly demonstrated the potential of these cells in treatment of various fertility related conditions. These studies, although promising, should be considered preliminary and they need more research, involving clinical trials to fully evaluate BMCs role in reproductive medicine.

## BIOGRAPHY

Nayana Patel is a Medical Director of Akanksha Hospital and Research institute, India. She is considered as pioneer in the field of IVF and surrogacy in India. Her fertility clinic have helped in deliver of total 1195 surrogate babies to national and international couples till date.

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Marco Fadda, Adv Cell Sci Mut. 2019, Volume 3

## THE USE OF IMPROVED TRADITIONAL GMP MANUFACTURING TECHNIQUES CONTRIBUTES TO THE SUCCESS OF LARGE SCALE STATE-OF-THE-ART PRODUCTION OF EMA-APPROVED CARTILAGE SUBSTITUTE

**Marco Fadda**

Comecer SPAv, Italy

Recent progresses in several different fields of advanced therapies manufacturing showed an increasing demand for new, enhanced, effective processing and expansion methods. Main goals of this renewed effort aim at reducing the impact of the COGS in the development, adoption and finally commercialization of ATMPs. Moreover, discovery and clinical proof of different, improved treating methods for certain diseases, opens demand for having available high quantities of a given product, impacting on and challenging the production capacity for suitable and successful scale-up. The approach described here, while not changing the process as initially developed and approved by the regulatory authorities for low-scale production, addresses the issues above, boosting the production capabilities in a brand-new full GMP-compliant designed plant. Key points are the use of isolation technology together with a new modular and flexible approach for safe incubation of a large number of individual batches. This approach has been coupled with an accurate matching between the low-and large-scale process steps, a significant level of process automation (both in work list and patient material management) and finally, a complete top-class track and trace software control and management system. Under these premises, the plant will be able to deliver the required doses of the ATMP drug (several thousand patients per year), under full respect of all the quality issues and in total compliance with all the regulatory rules.

## BIOGRAPHY

Marco Fadda is a Biomedical Engineer who began his career as a researcher investigating bone cutting quality using robot held tools, followed by development of medical robotics, customer training and OR support. Successively, he served as Executive for top brands in the Medical Device Industry, with focus to understanding medical needs and transforming them into procedural solutions. He is dedicated to the development of principles and solutions for managing cellular productions in aseptic environments since 2014. His main goal is in the application of principles of Isolation Technology aiming at performing GMP research and production of ATMPs, simplification of the production processes, wider acceptance of these products.

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## HOFFA'S FAT-KEY TO UNLOCK CARTILAGE REGENERATION

**Radhesh R Menon<sup>1</sup>, Siddharth Shetty<sup>1</sup>, Vikram Shetty<sup>1</sup>, B Mohana Kumar<sup>2</sup> and Narendra N<sup>2</sup>**

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Osteoarthritis is the most common progressive degenerative disease affecting the knee joint. Osteoarthritis represents a disease where the prospects of stem cell based therapy offers considerable hope. Hoffa's fat aka infra patellar fat pad (IPFP) an intra-articular and extra synovial structure in the knee joint are capable of chondrogenic differentiation and this property can be exploited to address the damage to the articular cartilage. Stem cells obtained from IPFP were analyzed based on various cellular characteristics, such as the yield, viability, growth kinetics, colony-forming ability and expression of selected phenotypic markers. The fat pad samples with prior consents were obtained from patients who presented for primary total knee arthroplasty to the Department of Orthopedic Surgery at K S Hegde Medical Academy. The fat pad samples were processed at the Stem Cell Laboratory at KSHEMA. A total of five samples were used for the establishment of stem cell lines. Nucleated cell number per one gm fat tissue ranged from 0.36 million to 1.05 million and total adherent cell number after 14 days culture per one gm fat tissue was varied from 0.3 million to 1.0 million, showing the potential of high yield. Isolated cells exhibited small spindle-shape morphology and the viability was >97.5% at all passages examined (P1-P3). Proliferation rate of IPFP-stem cells was high and average population doubling time was found to be  $66.32 \pm 6.60$  hrs. As a potency marker, IPFP-stem cells showed high colony formation ability. Flow cytometry analysis revealed that cell populations were over 70% positive for the mesenchymal stem cell (MSC) markers, such as CD29, CD44, CD73 and CD90, but CD146 and CD166 showed only <10% positivity. In addition, IPFP stem cells are also being assessed for their chondrogenic potential. To conclude, IPFP derived stem cells have rich yield and viability and were shown to be highly proliferative with expression of phenotypic markers specific to multipotent stem cells.

## BIOGRAPHY

Radhesh R Menon is a final year post graduate student pursuing Orthopaedic Surgery at K S Hegde Hospital which is a part of the well-known NITTE University, India.

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