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International Conference on

# CARDIOLOGY AND CARDIOVASCULAR MEDICINE

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International Conference on

# STEM CELLS AND REGENERATIVE MEDICINE

June 18-19, 2018 | Osaka, Japan

# DAY 1

## Keynote Forum

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**Nidhish Tiwari**
Jacobi Medical Centre, Albert Einstein College of Medicine, USA

### Biography

Nidhish Tiwari completed medical school in New Delhi, India and moved to the USA to pursue his medicine residency and chief residency at Jacobi Medical Center followed by the fellowship in cardiology from Montefiore Medical Center, both under Albert Einstein College of Medicine at Bronx, New York, USA. He is currently working as Assistant Professor at Albert Einstein College of Medicine and is also an Associate Director of Cardiovascular Service at North Central Bronx Hospital at Bronx, New York, USA.

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# NEWER ECHOCARDIOGRAPHIC TECHNIQUES FOR AORTIC VALVE IMAGING: CLINICAL AIDS TODAY, CLINICAL PRACTICE TOMORROW

Increasing life expectancy is expected to lead to a corresponding increase in the prevalence of aortic valve disease (AVD). Further, the number of indications for trans catheter aortic valve replacement (TAVR) as a treatment option for AVD is expanding, with a growing role for echocardiography in its management. In this review we summarize the current literature on some newer echocardiographic modalities and the parameters they generate, with a particular focus on their prognostic and clinical value beyond conventional methods in the management of aortic stenosis, TAVR, and aortic regurgitation. Speckle tracking and 3D echocardiography are now increasingly being used in the management of AVD. For instance, global longitudinal strain, the best-studied speckle tracking echocardiographic parameter, can detect subtle subclinical cardiac dysfunction in patients with AVD that is not apparent using traditional echocardiographic techniques. The emerging technique of 3D full volume color Doppler echocardiography provides more accurate measurement of the severity of aortic regurgitation than 2D-proximal iso-velocity surface area. These novel techniques are promising for evaluating and risk stratifying patients to optimize surgical interventions, predict recovery, and improve clinical outcomes.

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**Sisen Zhang**
Henan University of Chinese Medicine, China

### Biography

Sisen Zhang, doctor of medicine, chief physician, famous emergency medical expert and the first time Chinese medicine outstanding demeanor award winner. He is currently working as, director of the China Central Plains Institute of Cardiopulmonary brain Resuscitation, Vice president of Zhengzhou People's Hospital, Henan Provence, China. He has published more than 10 SCI papers and has been serving as an editorial board member and standing member.

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Note:

# CLINICAL RESEARCH AND APPLICATION OF NEW TECHNIQUE ABOUT ABDOMINAL CARDIOPULMONARY RESUSCITATION

External chest compression cardiopulmonary resuscitation (CPR) is currently the primary treatment for cardiac arrest. After more than 50 years of clinical practice, the return of spontaneous circulation (ROSC) has been improved to a certain extent, but the survival rate of patients discharged from hospital is still not ideal. The reason is that: Some cases have chest compressions contraindication, some are prone to the fracture of the chest ribs during chest compression, and chest compression cannot be combined with artificial circulation and respiration, which seriously affects ROSC rate. In order to improve the ROSC rate of cardiac and respiratory arrest, it is imperative to popularize the abdominal CPR. Professor LX Wang put forward a new theory of abdominal CPR through repeated basic and clinical studies, and invented an abdominal lifting and compression CPR instrument, and the results of clinical application study are of great academic recognition. As the director of phase III clinical trials, Zhengzhou people's Hospital was the first to conduct clinical research in dozens of large hospitals in China. In the past three years, Under the leadership of Professor SS Zhang, the research team in the hospital has rescued more than 100 patients, with a success rate of about 22.5%, and published three international and more than ten Chinese series papers, including the world's first paper on the second district of SCI-JCR, and his project has been approved as a provincial and municipal key scientific research project, and won the first prize of provincial and municipal science and technology progress award; Given the outstanding achievements in abdominal CPR, Professor SS Zhang was approved as a doctoral tutor in emergency and critical medicine at Southern Medical University. With the support of the Chinese government, he established the China Central Plains Institute of Cardiopulmonary brain Resuscitation, which consists 6 specialized laboratories and 6 research branches, including the First Affiliated Hospital of Zhengzhou University and the First Affiliated Hospital of Henan University, which form a clinical research network of abdominal CPR covering the whole province, and also laid a good foundation for the clinical research and application.

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**Yusuke Yamamoto**
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### Biography

Yusuke Yamamoto has completed his PhD in Molecular Physiology from Waseda University in 2008 and postdoctoral studies under Prof. Frank McKeon and A/Prof. Wa Xian at Genome Institute of Singapore. He has been interested in how adult stem cells maintain their stemness throughout the lifespan as well as identifying cell-of-origin in esophageal adenocarcinomas and high grade serous ovarian carcinoma, which are most aggressive type of cancers with poor prognosis. He has published more than 40 papers in reputed journals, including Nature and Cell.

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# CLONING BARRETT'S STEM CELLS SUGGESTS PATHS TO INITIATION OF A PRECANCEROUS LESION

Stem cell populations of columnar epithelia collectively resist cloning in their immature states. By modifying the culture technique for human intestinal stem cells, we have cultured the stem cells from precancerous lesion known as Barretts esophagus which is intestinal metaplasia, emerged from a squamocolumnar junction and would eventually evolve to esophageal adenocarcinoma. Here we report the isolation and propagation of distinct, patient-matched stem cells of Barrett's, gastric and esophageal epithelia that yield divergent tumor types following *in vitro* transformation and xenografting. Exome-seq revealed a broad mutational spectrum unique to Barrett's stem cells that likely reflect the risk for oncogenesis. Remarkably, 25% of cases show no cancer-related genomic changes, suggesting that Barrett's initiates without driver mutations. Most cases, however, sustain patterns of deletions almost identical to adenocarcinoma. Notably, those suspected of low-grade dysplasia have p53 mutations or undergo amplifications of proto-oncogenes and receptor tyrosine kinases, implicating these events in lethal transitions. Our findings suggest paths for the initiation and progression of Barrett's esophagus and define a discrete stem cell underlying its regenerative growth whose eradication could prevent esophageal adenocarcinoma.

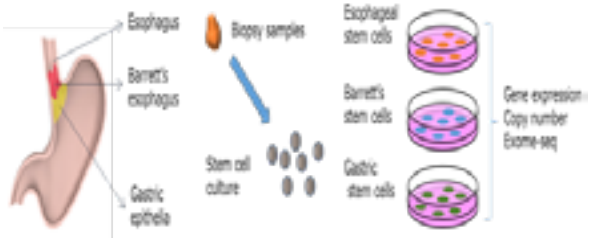


Figure1: A strategy for the stem cell culture of Barrett's, esophagus and gastric stem cells

### Related Publication

Yusuke Yamamoto, Xia Wang, et al., (2016) Mutational spectrum of Barrett's stem cells suggests paths to initiation of a precancerous lesion. Nature Communications. 7: 10380

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**Kampon Sriwatanakul**
Vita Stem Co. Ltd., Thailand

### Biography

Kampon Sriwatanakul is the president of Vita Stem Co. Ltd., Bangkok and an internationally recognized pioneer of stem cell therapy. He is currently engaged in research and development projects related to application of mesenchymal stem cell in the anti-aging and regenerative medicine.

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# APPLICATIONS OF STEM CELL TECHNOLOGY IN ANTI- AGING MEDICINE

At present there is no convincing evidence that existing "antiaging" treatments can slow aging or increase longevity. However, a variety of experiments in both animals and humans indicate that aging rates and life expectancy can be altered. General strategies that appear promising include interventions that reduce oxidative stress and cell replacement therapies can deal with specific age-related pathologies. Telomere length (TL) in blood cells is considered as a molecular marker of ageing. Circulating cell-free DNA (cfDNA) and unconjugated bilirubin (UCB) are dynamic blood constituents that need to be further explored. As we age, and in certain diseased states our cellular ability to translate a transcribed mRNA code into a functional protein, is impaired. Although the genesis of this clinical condition can be somewhat complex, it is characterized by intra-cellular protein accumulation. This accumulation not only decreases cellular function, but also impedes the translational capacity of the cell. We believe the primary etiology of this is a decrease in Chaperone Protein function inside the cell. In this paper we report that cellular aging is marked by an increase in both circulating HSP70 and cfDNA, which are significantly correlated to each other.

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# COMBINED THERAPEUTIC MEDICAL DEVICE AND STEM CELLS FOR REGENERATIVE NANOMEDICINE

**Nadia Benkirane-Jessel**
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In our group we explored a new generation of smart living implants combining not only active therapeutics but also stem cells, as a novel strategy to regenerate stabilized cartilage and avoid prosthesis, by achieving regeneration of its sub-chondral bone foundation, requirement which is failing today in the clinic. A unique nanotechnology strategy is used to entrap, protect, and stabilize therapeutic agents into polymer coatings: nano-reservoirs, covering nano-fibres of implantable nano-fibrous membranes for bone and cartilage regeneration. Upon contact with cells, therapeutic agents become available through enzymatic degradation of the nano-reservoirs. As cells grow, divide, and infiltrate deeper into the porous membrane, they trigger slow and progressive release of therapeutic agents that, in turn, stimulate further cell proliferation. The nano-reservoirs technology enables to reduce the quantities of required therapeutic agent (compared to soaked membranes for instance) thereby reducing costs.

## Biography

Nadia Benkirane is Research director and head of the "Regenerative Nano¬medicine" laboratory, at INSERM. She was leader of "Active Biomaterials and Tissue Engineering" team INSERM 977. She received her PhD. from University Louis Pasteur, France. She joined the IN¬SERM U595 in 2002 as a post-doc, and re¬ceived the diploma to direct the research (HDR) in 2004. Jessel got the permanent position (CR1) in the INSERM 595 laboratory in 2004 and Research Director (DR2) posi¬tion in the INSERM 977 and head of "active Biomaterials and Tissue Engineering team.

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# STEM CELLS AND HYPERBARIC OXYGEN THERAPY FOR TRAUMATIC BRAIN INJURY MANAGEMENT

**Hazem Ahmed Mostafa**
Ain Shams University, Egypt

## Biography

Hazem Ahmed Mostafa is an internationally recognized neurosurgeon with over two decades of clinical and research experience. He has devoted his career to developing and providing rigorous, comprehensive and compassionate care to those with cancer, neurological degenerative diseases andpediatric disorders. He's affectionately known as Dr Brain and Spine. He is a professor in the Department of Neurosurgery at Ain Shams University, Egypt since 2014. He is a Consultant of Neurosurgery at his own private clinics Neuro-Clinic Cairo and Hurghada - Red Sea, Egypt since 2001. Hazem has dedicated a significant part of his career to developing innovative educational research with over 33 published research papers in the Egyptian Society journal. Hazem is an active member of the Egyptian Society of Neurological Surgeons since 1997. He is an international Faculty at AO Trauma Foundation. He is also an international fellow member of the Institute of Brain Chemistry and Human Nutrition (IBCHNUK).

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**Introduction:** Over the past 30 years there has been a significant reduction in mortality following severe TBI together with improved outcome. This has been largely due to the use of evidence-based protocols emphasizing the correction of parameters implicated in secondary brain injury. The main parameters are cerebral blood flow, cerebral oxygenation and management of co-morbidities. Neuroinflammation is a well-established secondary injury mechanism following TBI.

**Methodology:** Inspired by success in Parkinson's and other neurodegenerative diseases, stem cell based therapy is believed to provide biobridges, can stabilize blood-brain barrier, reduce the oxidative stress and provide immunomodulation and neuroprotection. Hyperbaric oxygen may alleviate secondary insult in TBI through the modulation of the inflammatory response. Animal studies showed that hyperbaric oxygen improves neuroplasticity, reduce the inflammatory markers and neuronal apoptosis following TBI.

**Sources of stem cells:** Modulating endogenous stem cells or Cell transplantation (using exogenous stem cells) from fetal/embryonic, bone marrow stromal cells, umbilical cord cells or induced pluripotent stem cells (iPSCs).There is plenty of literature showing good response of stem cell therapy, mesenchymal stem cells in particular, on the outcome in rat TBI models.The animal models indicate some vulnerability of the stem cells to the hostile environment of neuroinflammation, which may limit their potential.

**Conclusion:** The results although very encouraging, are still in the laboratory/preclinical phase and lots of technical, ethical and logistic issues have to be solved before shifting to clinical trials. Hyperbaric oxygenation can provide less hostile microenvironment helping with repair and provide better use of stem cell induced growth factors.

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**Nan Huang**
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# TIME SEQUENCE FUNCTIONAL STENT: A NOVEL CONCEPTION AND CLINIC PRACTICE

Restenosis and late thrombus formation are the most challenges to stent intervention. Drug release from a drug eluting stent (DES) is a very effective solution for suppressing restenosis, but increasing late thrombus rate is even dangerous because of over 50% of death rate. Recently, a stent consists of metal stent/titanium oxide film/drug eluting coating (mixture layer of the biodegradable polymer PLGA and rapamycin) produced by author's lab. has been applied in clinic in China. The two surface coating treated stent played multifunction anti-restenosis and thrombus resistance after stent intervention. Clinic trial date showed that restenosis rate of the developed stent was as lower as 1.1%, and no late thrombus, however the late thombus rate of comparing stent was 2.1% during one year and after four years the thrombus formed patients in comparing group were increased to 3.9%, and 3% patients in comparing group were die due to the late thrombus. However no late thrombus and no cardiac death were reported for the multilayer stent group. The stent intervention have applied on about 70,000 patients, the follow up investigation for one year with 2,000 patients revealed that the late thrombus,cardiac death rate, TLF, and MACE are 0.1%, 0.1%, 0.2%, 0.65% respectively, a order of magnitude lower than other commercial stent.We proposed a novel conception: "Time sequence functional stent", the stent which possess the functions that can always match the interaction of the stent with the biological environment of the host in the intervention time sequences can has the ability to suppress the complications in the clinic practice. This presentation discussed in detail about how the developed multilayer stent match the conception of time sequence functional stent, and the further development tendency of a stent according to the conception.

## Biography

Nan Huang has been the Chairman of the International Committee of Surfaces and the Interfaces of Biomaterials, and the Fellow of the International Union of Societies for Biomaterials Science & Engineering since 2007 and 2008 respectively. He was the Chairman or Co-Chair of 5 international conferences. He published over 400 papers on the international journals, 50 pieces of inventions, and presented over 30 times on international conferences as plenary speaker or keynote speaker. And he is an inventor of a stent with novel multifunction applied in clinic. His team is developing a new type of ventricular pump and thrombus filter cooperating with companies.

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