

SPEAKER SPOTLIGHT: Stem Cell Therapies in Regenerative Medicine

Stem Cell research has become an integral component of regenerative medicine as stem cells can repair or replace old cells and can heal the recipient. Major influences in the growth of stem cell research include the development of cellular therapy for neurodegenerative disorders such as Parkinson's and Alzheimer's, while further treatment for spinal cord injury, type 1 diabetes, cardio and oncology therapies have played a crucial role. The rise of therapeutic success is assisted by innovations in the manufacturing of stem cells, with bioprocessing methods and techniques in tissue engineering playing a pivotal role in stem cell development. Experts are vigorously working on cutting-edge therapeutic innovations and clinical procedures to identify new targets for stem cell development.

Q1: What project are you currently working on?

My work is focusing on adipose mesenchymal stem cell research and clinical trials for patient care.

The aim of our latest study was to assess the histological and morphological effects of autologous infusion of adipose-derived stem cells (ADSC) on an established and chronic vocal fold scar in a rabbit model comparing it with an untreated scar and the traditional treatment of hyaluronic acid injection.

Recently, several studies have been performed on animal models regarding the effect of cell therapy on scarred vocal folds. Human embryonic stem cells, human mesenchymal stem cells from bone marrow or autologous adipose stem cells in scarred vocal folds, with very promising results. The experimental model in the vast majority of studies is based on creating a trauma on the vocal fold and within 7 days maximum, there is implantation of stem cells. Our protocol is based on creating a trauma on the vocal folds of an experimental model (rabbit) and infusing adipose-derived stem cells (ADSC) on the scar after 18 months.

We conclude that autologous injection of adipose-derived stem cells on a vocal fold chronic scar of a rabbit enhance the healing of the vocal fold and

the reduction of the scar tissue, even comparing with other treatments. (<https://www.ncbi.nlm.nih.gov/pubmed/26933440>).

Q2: What do you expect to be the biggest news to come out of stem cell research in 2020?

I believe that in the years to come stem cell research will reach its peak in several areas such as:

1. Stem cell blood products will be widely available.
2. Stem cell scientists will advocate for evidence-based medicine more routinely for patient safety, and for the field.
3. Several major academic hospitals will offer formal physician training in cellular and stem cell-based regenerative medicine.
4. Diabetes will be partially controllable in some patients by stem cell-produced mini pancreases in clinical trials.
5. A stem cell-based ALS treatment will show signs of efficacy in clinical trials and raising hope of significantly extending lifespan and quality of life for patients.

Vasiliki Kalodimou

Lab Director at the Flow Cytometry-Research and Regenerative Medicine Department of IASO Maternity-Pediatric and Research Hospital



Vasiliki Kalodimou is the Lab Director at the Flow Cytometry-Research and Regenerative Medicine Department of IASO Maternity-Pediatric and Research Hospital in Athens. Before this, Kalodimou served as a haematology research associate at General University Hospital of Heraklion, and as an instructor at both the General University Hospital of Heraklion and the Ipokratios Medical-Technical Institute of Athens.

Kalodimou received her bachelor's degree in Human Physiology and her master's degree in Human Molecular Genetics from the Imperial College University of Medicine. She completed her PhD at the University of Medicine in Athens.

Since 2006, her research interests include: stem cells in everyday practice and their applications in regenerative medicine and Flow Cytometry, human genetics & population genetics as well as cellular standards. In collaboration with the Hellenic Flow Cytometry Society, Kalodimou has developed quality control schemes for stem cell marker enumeration.

In addition to collaboration with state universities and pharmaceutical companies on research projects, Kalodimou frequently publishes her findings and has 2 patents. She is in the editorial board and a reviewer in several international journals as well as board member in scientific organizing committees for medical conferences.

6. Clinical trials will suggest that arthritis can be partially treatable with stem cells that will have been proven to effectively and safely regenerate cartilage.

7. Replacement of entire organs will seem more realistic in the years following 2020.

Q3: You are giving a talk on cellular standards. What are the major issues you have encountered?

Many labs are facing problems on how to apply and follow the standards in a daily routine, as well as quality controls and enumeration schemes for cellular therapies. This results in bad quality service for the product and for the potential patient care.

We need to keep in mind that standards are designed to provide minimum guidelines for organizations, facilities, and individuals performing cellular therapy product collection, processing, or administration or providing support services for such procedures. They represent the basic fundamentals of cellular therapy that can be applied to any cell source or therapeutic application and are intended to be used throughout product development and clinical trials. Cellular therapy is an emerging and evolving field and standards are required for the establishment of a quality management program in order to promote quality medical and laboratory practice in a broad range of cellular therapies. We need standards and guidelines in order to enhance

and improve patient care and the healthcare system sufficiently in the field of cellular therapies.

Q4: Who are you most excited to see in the upcoming 6th Annual Stem Cell and Regenerative medicine Congress?

As a speaker of last year's 5th Annual Stem Cell and Regenerative Medicine Congress in London, I am looking forward to interacting with fellow researchers, exchanging ideas, discovering industry innovations and interacting with leading biotech companies, global pharma organizations in the field of stem cells and regenerative medicine.

I'm also looking forward to panel discussions focusing on the new discoveries of stem cells in regenerative medicine, manufacturing innovations in clinical trials and bioprocessing methods in cell line development.

Through this year's conference I hope to see the latest developments in the field of cell and gene therapies that offer innovative therapies for treating patients, particularly where other traditional therapeutics have been ineffective.