Overview

Stem cells are a population of precursor cells capable of evolving into many different cell types in a multicellular organism. They differ from other cells in the body in their ability to renew themselves for long periods. Based on the potency, there are several types of stem cells: 1) embryonic stem cells, which are characterized as pluripotent in nature; 2) adult stem cells, exist within different tissues of the body and are characterized to make cells of the tissue where they reside; and 3) induced pluripotent stem cells (iPSCs), are reprogrammed adult stem cells to revert back to an embryonic-like state. Dr. Shinya Yamanaka and his student Kazutoshi Takahashi developed a novel method of creating iPSCs which is revolutionizing drug discovery research; the reprogramming and differentiating adult stem cell in specific cell type is providing a more relevant model for preclinical research. Recent advancement in the field of stem cell biology has revolutionized biomedical research and therapy in medical and veterinary fields. The application of stem cells in human medicine is well accepted and commonly used in chronic and accidental injuries. In stem cell therapy, new cells are introduced into adult body where they carry out tissue repair and regenerative functions, stem cells have been used for possible treatment of cancer, diabetes, neurological disorders and other biomedical conditions. Ever since the remarkable discovery of iPSCs, the field has continued to evolve with exciting discoveries furthering our understanding of early development, the process of cellular reprogramming, acquisition and maintenance of pluripotency, determination of cell fate and enhancing our ability to model diseases in vitro. These advances and the possibility of generating patient or disease specific pluripotent stem cells placed the field on a trajectory that may lead to personalized cell therapy in the future.

Objectives

1. To discuss and understand the importance of scientific advancements in the paradigm shift toward regenerative medicine, with a particular focus on adult stem cell therapy.
2. Next, the program aims to simply promote the great potential of iPSCs for stem cell therapy and research.
3. To expand global awareness of the adult stem cell therapies, reducing misperceptions surrounding the field of cellular research.
4. Establishing personal connections and providing a great platform for student, young researchers and research scientists to share their current findings in the field of stem cell biology.

Course Details

Module A: Introduction to Stem Cell Biology
Developmental Biology and Human Embryology
Introduction to Stem Cells and Regenerative Medicine
Processes linking stem cells, primary cell function, and structural development
Development of vasculature, CNS, and other germ layer development Phanbranpotentiality of embryonic and somatic stem cells
The discovery of iPSCs and the four factors

Module B: Recent advances in clinical applications of stem cells
Principles of development for stem cell engineering
Regenerative biology
Inter-tissue communications in regeneration
Regenerative medicine & aging
Translation to therapy
Engineering solutions to regenerative medicine

Module C: Policies and Ethics - Debate
Legal and Global Perspectives
Controversies

Module D: Hands on Training

Who can attend

- Researchers and Faculty at University, Government, and industrial laboratories.
- Students at all levels (MSc/PhD) from academic and technical institutions.

How to apply: Interested candidates must login GIAN-MHRD website (http://www.gian.nic.in/) to fill an application. Please submit your detailed resume along with statement of purpose. For more details contact: giandabsl@gmail.com or Visit: http://www.slsouh.org/stemcells

REGISTRATION FEES

Participants from abroad: US $500
Student/s’ Ph.D scholars/Postdocs: Rs. 1,500/-
Industry: Rs. 15,000/-
Academic Institutions: Rs. 5,000/-

For mode of payment please visit: http://www.slsouh.org/stemcells

The above fee includes all instructional materials, computer use for tutorials, 24 hr internet facility. The participants will be provided with single bedded accommodation on payment basis.

TEACHING FACULTY

Dr. Venkuri is the Director of Research and Development for Cell Biology at Thermo Fisher Scientific. In this capacity, Dr. Venkuri leads R&D activities in stem cell product development in the areas of human iPSC, adult stem cells, immune cells and cell line engineering. His research is focused on developing new and improved methods for perfusion cultivation of engineered hematopoietic stem cells for bone and blood marrow transplantation. Dr. Venkuri previously served on the faculty at Thomas Jefferson Medical School, where he developed cell screening assay systems for Parkinson’s disease drug discovery. Dr. Venkuri collaborates with researchers in academia and industry, striving towards the successful utilization of stem cells in regenerative cell therapies. He holds a Ph.D in Cell Biology from Sri Venkateswara University in India and performed his postdoctoral work at the National Institutes of Health. Dr. Venkuri has authored over 50 publications and has edited or co-edited several stem cell focused books, including Stem Cell Assay Regulatory Network Theory, MSC assays and applications, MSCs and Cell Therapy, Neural Development and Stem Cells and more recently, Pluripotent Stem Cell Assays by Springer Press.

Prof. Polan Seshagiri is a Professor at MRDOS (Molecular Reproduction, Development and Genetics), Indian Institute of Science Bangalore, India. He completed PhD from Indian Institute of Science and Post-doctoral training at Dept. of Vet. Sci., Univ. of WI, Madison, USA. Subsequently he joined as faculty at Primate Research Centre, Univ. of WI, Madison, USA as Assistant Scientist. Later he joined as faculty MRDOS (Molecular Reproduction, Development and Genetics), Indian Institute of Science Bangalore, India. His research interest is in studying early mammalian development with regard to the acquisition of fertilizing potential of spermatogenesis and development of embryos through pre-implantation stages with particular reference to the phenomenon of blastocyst hatching. Besides, his lab is studying on cell lineage specification by using ES-cells as model system. He has been involved in stem cell research for more than a decade. He has co-authored more than 100 primary articles, reviews, and editorials on different aspects of developmental biology and stem cell biology. He has been invited to deliver keynote lectures and Keynotes in India and for the last 20 years has acted as a scientific consultant for a broad range of constituencies in academia, government, regulatory affairs and industry.

Dr. Mahendra Rao an eminent scientist in the field of stem cell biology. He is internationally known for his research on human embryonic stem cells (hESCs) and has over two decades worth of experience, not only in the academic aspects of the field, but also in government, regulation and the industrial and clinical applications of stem cells. His association with academia includes prestigious faculty positions in reputed universities such as the National Institutes of Health (NIH) and the Buck Institute for Age Research. As the founding director of the Centre for Regenerative Medicine (CRM) at Newcastle upon Tyne, he has taken the generation of 400 induced pluripotent stem cells (iPSCs) to clinical trials and has been involved in clinical trials for a range of degenerative disorders. He has served as scientific advisor to companies and foundations such as Life Technologies (Now Thermo Fisher Scientific) and the New York Stem Cell Foundation (NYSCF). Dr. Rao has also worked with the U.S. Food and Drug Authority (FDA) and has served on advisory panels to the governments of the U.S., Singapore and India on policies regarding HESC (Human Embryonic Stem Cell). Dr. Rao is tenured at the University of Nebraska Medical Center in both Neurology and Anatomy and has over twenty submitted and ten issued patents. Dr. Rao, has recently joined iStem to lead the Accelerator program for Discovery in Brain disorders using Stem cells (A0D3S) program at the Cluster.

Dr. Gopal Pande obtained Master’s Degree in 1975 from University of Delhi with specialization in Cell Biology and his Ph.D. degree in 1981 from the University of Bombay, India, on cytogenetic studies on acute myeloid leukemia. He joined in Centre for Cellular and Molecular Biology (CCMB) as a Scientist B in 1982. His research interests include the role of integrins in regulation of growth of cell adhesion and motility, differentiation of normal and leukemic hematopoietic cells and the developmental biology of Dictyostelium discoideum with special reference to the role of intracellular calcium and cell cycle. His group has recently initiated work on preparing new substrates for tissue engineering of the osteogenic cells. He is in charge of the flow cytometry facility at CCMB and was appointed as the President of The Cytometry Society India for the period 2006-2008.

Course Coordinator

Prof. P. Reddanna and Dr. A. Bindu Madhava Reddy
Department of Animal Biology

Dr. G. Ravi Kumar, Department of Biochemistry
School of Life Sciences, University of Hyderabad, Hyderabad, INDIA.

Please send your detailed resume along with statement of purpose to giandabsl@gmail.com on or before June 25, 2017.