DESCRIPTION

A much-needed primer on the use of laser flow cytometry for stem cell analysis

Laser flow cytometry is a powerful tool for rapid analysis of cells for marker expression, cell cycle position, proliferation, and apoptosis. However, no resources specifically address the use of this methodology for the study of stem cells; this is especially important as stem cell analysis involves specialized methods and staining procedures based on specific characteristics such as marker expression, cell size, drug transport, and efflux of the stem cells.

Now, this book reviews these procedures, discusses the science behind them, and provides real-world examples to illustrate the usefulness of the methods. It brings together world-class experts in pathology, biophysics, immunology, and stem cell research, who draw upon their extensive experience with the methods and show examples of good data to help guide researchers in the right direction.

Chapter coverage includes:

• Stem cell analysis and sorting using side population

• Flow cytometry in the study of proliferation and apoptosis

• Stem cell biology and application

• Identification and isolation of very small embryonic-like stem cells from murine and human specimens
• Hematopoietic stem cells—issues in enumeration

• Human embryonic stem cells: long-term culture and cardiovascular differentiation

• Limbal stem cells and corneal regeneration

• Flow cytometric sorting of spermatogonial stem cells

• Breast cancer stem cells

• Stem cell marker expression in cells from body cavity fluids

This book is an essential resource for all graduate students, practitioners in developing countries, libraries and book repositories of universities and research institutions, and individual researchers. It is also of interest to laboratories engaged in stem cell research and use of stem cells for tissue regeneration, and to any organization dealing in stem cell and tissue regeneration research.

ABOUT THE AUTHOR

Awtar Krishan, Ph.D is a Professor of Pathology at the University of Miami School of Medicine. From 1965 to 1977, he was at the Sidney Farber Cancer Institute, Harvard Medical School as Head of the Tissue Ultrastructure and Experimental Pathology Labs. Some of his recent work has focused on development and applications of a new flow cytometer which can measure cell volume and marker expression of stem cells in human apheresis samples. Dr. Krishan has more than 160 publications in peer reviewed journals.

H. Krishnamurthy is working as Scientific Officer 'E' and in charge of Flow Cytometry and Confocal Microscopy Facilities at the National Centre for Biological Sciences, Tata Institute of Fundamental Research, Bangalore, India. His research interest is hormonal regulation of spermatogenesis and trafficking and signaling of gonadotropin receptors.

Satish Totey is Chief Scientific Officer, Stempeutics Research Pvt. Ltd and Director at the Manipal Institute of Regenerative Medicine in Bangalore. Dr. Totey was amongst the small number of researchers who pioneered the isolation and characterization of pluripotent stem cells from human embryos. The cell lines he established have been listed in the NIH stem cell registry. He has also developed up-scaling of mesenchymal stem cells and is currently conducting phase-I and II clinical trials for myocardial infarction, leg ischemia, cerebral stroke and Multiple Sclerosis. He has published 90 research papers and holds 12 US patents.

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