

2nd International Cancer Study & Therapy Conference

February 20-22, 2017 Baltimore, USA

Identification and isolation of single mesenchymal stem cells

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Mesenchymal stem cells have properties that make them amenable to therapeutic use. However, the acceptance of mesenchymal stem cells in clinical practice such as in the treatment of diabetes and autoimmune diseases, cardiovascular disease, cancer therapy, and repair of birth defects require standardized techniques for their specific isolation. To date, there are no conclusive marker (s) for the exclusive isolation of mesenchymal stem cells. Our aim was to identify markers differentially expressed between mesenchymal stem cell and non-stem cell mesenchymal cell cultures. Examination and comparison of the phenotypes of mesenchymal stem cell and non-stem cell mesenchymal cell cultures revealed three differentially expressed markers - CD24, CD108 and CD40. We indicate the importance of establishing differential marker expression between mesenchymal stem cells and non-stem cell mesenchymal cells in order to determine stem cell specific markers, isolate and define Mesenchymal Stem Cells.

Biography:

Chaker Adra is investigating health, disease, and pioneering the field of organ engineering and regenerative medicine. He is discovering the Laws of Physics & Chemistry as manifested in The Language of Genomes and Living Organisms. He contributed to the emergence of the field of stem cell biology & tissue engineering. He cloned, characterized the family of phosphoglycerate kinase (PGK) genes and pseudogenes. He identified the PGK-1 promoter which has proven to be a powerful and widely used promoter. He designed and constructed The PGK1-Neo Vector which is being used around the world for gene therapy, to engineer, from embryonic stem cells, transgenic and knockout animals to understand the causes and mechanisms of all human diseases and find cures. He cloned the pgk-2 gene, showing for the first time that gene duplication, by retroposition more than 100 million years ago, have been used as a mechanism for evolutionary diversification and that mammalian genomes are fluid creating new species. He identified chromosomal regions containing asthma and atopy susceptibility genes. He described functional polymorphisms in Interleukin-4, IL-13 and their receptors, thus making these molecules, with STAT 6, targets for therapeutic treatment of allergic patients and preventive strategies. He discovered several cancer and stem cell specific biomarkers. In a series of groundbreaking experiments, he discovered several universal gene families and biochemical and/or physiological pathways operating in bacteria, yeast, plants, animals and humans (PGK, D4GDI/RhoGDI2/ARHGDI2, RhoGDI3/ARHGDI3, RTEF-1, HTm4/CD20L/MS4A Gene Family, LAPTM5, SMARCAD1 Helicase Gene Family, and SMARCAD1, The Fingerprints Gene).

Dr. Chaker Adra is a philanthropist and the inventor of 19 USA and International Patents.