detail the phenotypic changes occuring throughout the life time of a CAR T cell.

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EFFECT OF SERUM FROM TYPE 2 DIABETES MELLITUS PATIENT IN MESENCHYMAL STEM CELL-DERIVED SECRETOME TOTAL PROTEIN

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Keywords: Mesenchymal Stem Cells, Secretome, Serum.

Background & Aim: Mesenchymal stem/stromal cells (MSCs) are a promising cell-based therapy for regenerative medicine due to their ability to secrete multiple factors for tissue regeneration. However, recent studies revealed that the benefits of using MSCs for regenerative medicine are associated with their paracrine activity by secreting a wide variety of soluble factors. Cytokines, growth factors, and enzymes are secreted or released into the culture medium in response to the local microenvironment. The composition of MSC-derived secretome is significantly influenced by pre-conditioning treatment in vitro culture condition. The health status, serum used for the in vitro culture, and the presence of a pro-inflammatory environment might influence the MSC secretome. In this study, we would like to evaluate the effect of serum from type 2 diabetes mellitus (T2DM) patients in total protein concentration of secretome.

Methods, Results & Conclusion: Umbilical Cord-MSCs were seeded in the lower chamber of the trans-well plate at 5,000 cells per cm^2. MSCs were culture with DMEM supplemented with 5% Human Platelet until it reaches the confluence of 80%. The culture medium was discarded and change with DMEM. Secretome was collected after the MSCs were exposed with T2DM serum patient for 24 hours. Protein concentration was counted using BCA Protein Assay Kit.

Total protein concentration is MSC-derived secretome is lower when exposed with T2DM uncontrolled serum patient compare to MSC-derived without any treatment, 763.7±5.79 µg/mL and 876.6±38.33 µg/mL, respectively. In most cases, it was predicted that the level of total protein was more in Serum Culture Medium than in Serum-Free Medium. This is different from the result of this study. The decreasing concentration of total protein in MSC-derived secretome expose with T2DM serum patient might due to the activity of MSC in response to growth factor from the serum. Further investigation is needed to detect the specific growth factor in the secretome.

Total protein of MSC-derived secretome exposed to T2DM serum patient is lower compare to control.

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ACOUSTIC AFFINITY CELL SELECTION: A NON-PARAMAGNETIC SCALABLE TECHNOLOGY FOR T CELL SELECTION FROM UNPROCESSED APHERESIS PRODUCTS

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Keywords: CAR T cell therapy, Affinity Cell Selection, Acoustic processing.

Background & Aim: Acoustic Cell Processing is a unique acousto-fluidics platform technology for minimal manipulation of cells using ultrasonic waves. The platform has broad applications in the field of cell and gene therapy, e.g., cell concentration and washing, acoustic affinity cell selection and label-free cell selection. The acoustic radiation force exerted by the ultrasonic field on the suspended cells in combination with fluid drag forces and gravitational forces is used to manipulate the cells and perform a certain cell processing unit operation, e.g., separate, concentrate, wash or select. The technology is single-use, continuous, and can be scaled up, down or out. It therefore allows for a flexible and modular approach that can be customized to process a desired cell count, cell culture volume or cell concentration within a given required process time. Utilizing its proprietary multi-dimensional standing wave platform, MilliporeSigma has been developing the Acoustic Affinity Cell Selection (AACS) system for closed and automated Cell and Gene Therapy manufacturing, e.g., CAR-T immunocellular therapies. The AACS technology is an acoustic affinity cell selection method using acoustic (non- paramagnetic) affinity beads for positive or negative cell selection. A multi-dimensional acoustic standing wave is then used to separate the affinity bead-cell complexes from the unbound cells, thereby completing the process of a negative or positive cell selection.

Methods, Results & Conclusion: In this work the AACS system has been used to capture CD4+ and CD8+ cells from unprocessed apheresis products. The AACS column and acoustic section allow for a continuous flow of the initial cell population (pre-labeled with biotinylated antibodies) while acoustically retaining the acoustic affinity particles in the column. The affinity particles are functionalized with an avidin-capture biomolecule and thus capture the target cells that are kept inside the column, while the non-target cells are washed out of the column. Fig. 1 illustrates the typical chromatogram obtained during an AACS run, where non-target cells are washed out and target cells are retained and later recovered with a higher than 70% yield and at least 95% purity.

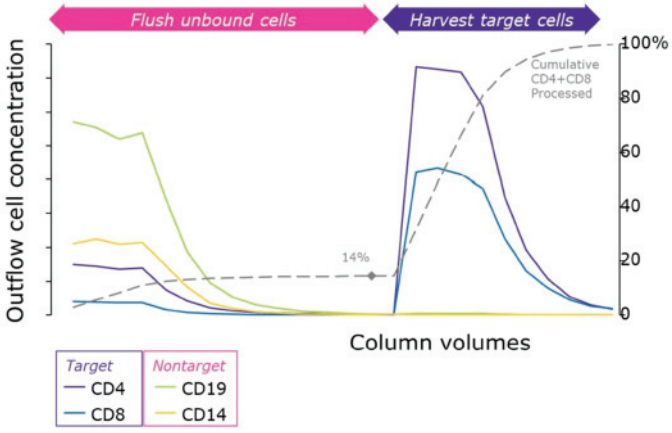

Fig. 1 (abstract 1263).

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A LOOK AT AZZUR CLEANROOMS ON DEMAND™ AS A NEW MODEL OF EARLY PHASE MANUFACTURING FOR PROCESS DEVELOPMENT AND MANUFACTURING SOLUTIONS

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Keywords: Cleanroom, Process Development, Manufacturing Solutions.

Background & Aim: The biopharma industry continues to accelerate breakthroughs in both large- and small-molecule formulations. Many