Human mesenchymal stem cells (hMSC) are multipotent adult stem cells present in numerous tissue sources in the human body. hMSC have advantages over other stem cell types due to the broad variety of their tissue sources, since they are immune-privileged, and for their ability to differentiate into various mesenchymal cell lineages. hMSC have become desirable totall iogenic culture engineering and cell therapy, including transplantation. hMSC are expanded in animal-derived media, which provide high quality of the culture medium and their performance is particularly crucial with regard to therapeutic applications, since hMSC properties can be significantly affected by medium composition and culture conditions. To date there have been efforts to develop media for the isolation of hMSC from various tissues. In addition, most of the common culture media for growth and expansion of hMSC, as well as media solutions for cell attachment, dissociation, and cryopreservation are typically supplemented with serum or other animal components. A defined serum-free (DSF), hMSC culture system optimized for hMSC isolation and expansion would greatly facilitate the development of robust, clinically-acceptable culture processes for reproducibly generating quality-assured cells.

Results

I. INITIAL ISOLATION

MSC-AT

Figure 1: Evaluation of hMSC-AT isolation using MSC NutriStem® XF supplemented with 2% human AB+ serum.

Figure 2: Comparison of hMSC-AT isolation utilizing MSC NutriStem® XF supplemented with 2% human AB+ serum vs. conventional culture without MSC Attachment Solution.

MSC-WJ

Figure 3: Comparison of hMSC-WJ isolation from cord plasma utilizing MSC NutriStem® XF supplemented with 2% human AB+ serum vs. conventional culture without MSC Attachment Solution.

MSC-AT

Figure 4: Evaluation of hMSC-PL isolation using MSC NutriStem® XF vs. FBS containing medium.

MSC-BM

Figure 5: Evaluation of hMSC-BM isolation using MSC NutriStem® XF vs. FBS containing medium.

MSC-PL

Figure 6: Suitability for Various Sources of hMSC

MSC-AT

Figure 7: Proliferation

MSC-AT

Figure 8: Self-renewal Potential

MSC-PL

Figure 9: Self-renewal potential of hMSC-WJ

II. EXPANSION

- hMSC from various sources can be efficiently isolated and expanded in MSC NutriStem® XF supplemented with 2% human AB+ serum.
- Higher number of hMSC was obtained after isolation using MSC NutriStem® XF compared to conventional culture containing serum-containing medium.
- Using MSC NutriStem® XF for isolation of hMSC inhibits purity of MSC population in earlier passages (demonstrating hematopoietic contamination compared to initial isolation using FBS-containing medium).
- The highest proliferation rate of hMSC from a variety of sources was achieved using MSC NutriStem® XF in comparison to other commercially available SF media.
- MSC NutriStem® XF supports long-term culture of hMSC from a variety of sources.
- MSC culture system MSC NutriStem® XF medium, MSC Attachment Solution, MSC Dissociation Solution, Rendiment Trypsin Solution, MSC Freezing Solution, allows the isolation and long-term expansion of hMSC from various sources, suitable for cell therapy and tissue engineering.

Summary

- hMSC from various sources can be efficiently isolated and expanded in MSC NutriStem® XF supplemented with 2% human AB+ serum.
- Higher number of hMSC was obtained after isolation using MSC NutriStem® XF compared to conventional culture containing serum-containing medium.
- Using MSC NutriStem® XF for isolation of hMSC inhibits purity of MSC population in earlier passages (demonstrating hematopoietic contamination compared to initial isolation using FBS-containing medium).
- The highest proliferation rate of hMSC from a variety of sources was achieved using MSC NutriStem® XF in comparison to other commercially available SF media.
- MSC NutriStem® XF supports long-term culture of hMSC from a variety of sources.
- MSC culture system MSC NutriStem® XF medium, MSC Attachment Solution, MSC Dissociation Solution, Rendiment Trypsin Solution, MSC Freezing Solution, allows the isolation and long-term expansion of hMSC from various sources, suitable for cell therapy and tissue engineering.

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- Poster: From the 23rd European Society for Animal Cell Technology (ESACT) Meeting: Flow Cytometry: O-banding karyotyping analyses of MSC-BM and AT expanded in FBS-containing medium.
- MSC NutriStem® XF"