

Cost and Quality Attributes of hMSC Production in Xeno-free Bioprocessing Media

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Abstract Text:

Human Mesenchymal Stem Cells (hMSCs) is one of the key raw material in regenerative medicine used for therapeutics, engineered tissues, and medical devices. Yet, achieving an economical process for hMSCs production remain a big challenge in the industry. Typical bioprocessing economic modeling outline media as one of the cost drivers of cell manufacturing. Hence the availability of an efficient xeno-free bioprocessing media will facilitate the manufacturing cost reduction as well as address regulatory hurdles associated with bovine serum components. Here, we evaluated and compared the hMSC characteristics in different media formulations containing bovine serum or 'xeno-free', to assess cells potency, functionality and characteristics. We confirmed the maintenance of critical hMSC functional properties including angiogenic cytokine (FGF, HGF, IL-8, TIMP-1, TIMP-2, and VEGF) secretion, tri-lineage differentiation, and immunomodulatory potential with the cultures in xeno-free media. hMSCs cultured in xeno-free media also maintained their rapid expansion and achieve confluency within 4-5 days of culture without any media exchanges. The economics of hMSC expansion in the bioprocessing xeno-free media was modeled and compared to other competitive hMSC cell/media systems for the critical productivity metric of Million cells/ L media, where the RoosterBio systems consistently outperformed traditional market leading systems by >8 fold.