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## Media and supplements must be optimized for mesenchymal stem cell expansion

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The long-term outlook for stem cell therapy predicts an increased need for high quality materials that are animal origin-free. Human mesenchymal stromal/stem cells (hMSCs) are an attractive target for clinical study as therapeutic agents. Large scale manufacturing of these adherent-dependent cell types necessitates movement away from planar culture and toward technologies such as stirred tank bioreactors where suspension culture using microcarriers is enabled. Cell culture medium and supplements are critical factors of the scale up process, yet many processes currently contain animal-derived components. Fetal bovine serum (FBS) is a commonly-used supplement associated with regulatory, supply, and consistency challenges. Eliminating this reagent will require thorough evaluation of animal origin-free materials for compatibility with stem cell therapy applications. Here, we evaluated growth of bone marrow derived hMSCs with a variety of cell culture media formulations and serum-free supplements. A high throughput shake flask platform was developed to test select media. A wide range of performance was observed between the different types of media and serum- free supplements. Also a positive performance in static culture was not necessarily predictive of that under agitated conditions with microcarriers. Additionally, we used recombinant trypsin and associated animal-free inhibitors to assess implementation of a fully FBS-free system. The combination of serum-free systems and high quality reagents supports the future implementation of large scale manufacturing solutions of hMSCs that will be required following clinical success.

### Biography

Anjali Verma completed her Masters in Biotechnology from IIT Roorkee, India and MS in Parmaceutical Sciences from Wayne State University, MI. She is a Scientist in the Stem Cell Bioprocessing Group at EMD Millipore and has been with the company for 8 years. Her group's current focus is on development of media, supplements and bioprocessing of human Mesenchymal Stem cells.

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