

SIMPLE AND CONVENIENT METHOD FOR ADIPOSE-DERIVED MESENCHYMAL STEM CELLS SERUM-FREE MEDIUM DEVELOPMENT

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Cell therapy aims to replace, repair or enhance the biological function of damaged tissue or organs using autologous or allogeneic cells. Mesenchymal stem cells (MSCs) are multipotent cells that can differentiate into cartilage, bone, adipose, and so on. Adipose-derived Mesenchymal Stem Cells (ADMSCs) are widely used for abundance and ease of collection in the human body. MSCs including ADMSCs are usually grown in a medium containing serum. We are trying to use a serum-free medium for variation, prion, and ethical problems. Therefore, we are contemplating how to easily develop an in-house serum-free medium. Design of Experiment (DOE) is a systematic method to determine the relationship between factors affecting a process and the output of that process. It is a statistical technique that can obtain maximum information with minimum experiment. DOE is effective in the reduction of time in the development of an in-house serum-free medium.

In this study, we showed an experimental approach to serum-free media for ADMSCs using DOE. It was performed according to the 3-step DOE, and the performance of the medium improved for each step. Through this process, the development of the medium was shown that it is not difficult than expected. It could be done quickly and simply, and furthermore, repeated 3-step DOE approaches can provide opportunities for continuous performance improvement of the in-house serum-free medium.