

The effect of DMEM and DMEM: F12 culture media on the growth of SHSY5Y cells

ABSTRACT

The human neuroblastoma cell line, SH-SY5Y cells, is commonly used as an in vitro model for neuroscience and neurobiology research. SH-SY5Y cells were established during the 1970's from the parental metastatic bone tumor, SK-N-SH cell line. The utilization of SH-SY5Y cells in neurobiology research is due to their resemblance to the human primary neuronal cells with several limitations, considering the cells are derived from malignant tumor cells. Since SH-SY5Y cells are widely cultured for research, several different culture media have been used to optimize the growth of the cells, including Eagle's Minimum Essential Medium (EMEM), Dulbecco's modified Eagle's medium (DMEM) and other recently developed culture media. The ability of SH-SY5Y cells to reach confluency in culture flasks ranges from 5 days to 15 days, depending on the culture media. Hence, the optimization of the culture media is crucial to achieve the fastest growth rate for the cells. The objective of the study is to evaluate the culture media for the proliferation of SH-SY5Y cells. We compared the growth rate of SH-SY5Y cells cultured in Dulbecco's modified Eagle's medium (DMEM) supplemented with 15% heat-inactivated fetal bovine serum (hiFBS), Dulbecco's modified Eagle's medium: Nutrient mixture F-12 (DMEM:F12) + supplemented with 15% hiFBS and DMEM:F12 supplemented with 10% hiFBS. In DMEM:F12 supplemented with 15% hiFBS, cells grew up to 6.67×10^5 cells. In DMEM:F12 supplemented with 10% hiFBS, cells grew up to 5.28×10^5 cells. In DMEM supplemented with 15% hiFBS, the cells grew up to 4.76×10^5 cells. There was a significant difference between culture media DMEM:F12 supplemented with 15% hiFBS as compared to DMEM:F12 supplemented with 10% hiFBS and DMEM supplemented with 15% hiFBS ($p < 0.05$).

Keyword: SH-SY5Y cells; Growth rate in vitro; Dulbecco's modified Eagle's medium (DMEM); DMEM:F12; Heat-inactivated fetal bovine serum (hiFBS)