NEWLY-ESTABLISHED CHINESE HAMSTER-DERIVED CELL LINE FOR PROTEIN PRODUCTION

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Mammalian cell lines are important host cells for the industrial production of pharmaceutical proteins owing to their capacity for correct folding, assembly, and post-translational modification. In particular, Chinese hamster ovary (CHO) cells are the most dependable host cells for the industrial production of therapeutic proteins.
We newly established cell lines from the Chinese hamster (*Cricetulus griseus*) from lung and ovary tissues. For lung tissue, according to Puck et al. (1958), minced lung tissues from female Chinese hamsters were placed in IMDM (20% FBS). Primary cultured cells mainly showed a fibroblast-like morphology. We continuously maintaining cell culture for a long time. Cells were immortalized by spontaneous transformation and could be cultured more than about 500 days. Chromosome number analysis showed that the ratio of aneuploid cells increased in the process of acquiring immortalization. Some translocations with the same pattern as CHO-DG44 and CHO-K1 derived cells were observed in Chinese hamster lung derived cells. Constructed cell pools were adapted to the serum-free medium by gradual decreases in the serum concentration. The serum-free-adapted cell pool was named Chinese hamster lung (CHL)-YN. For ovary tissue, we also established cell line using the same procedure and named it Chinese hamster ovary (CHO)-MK.

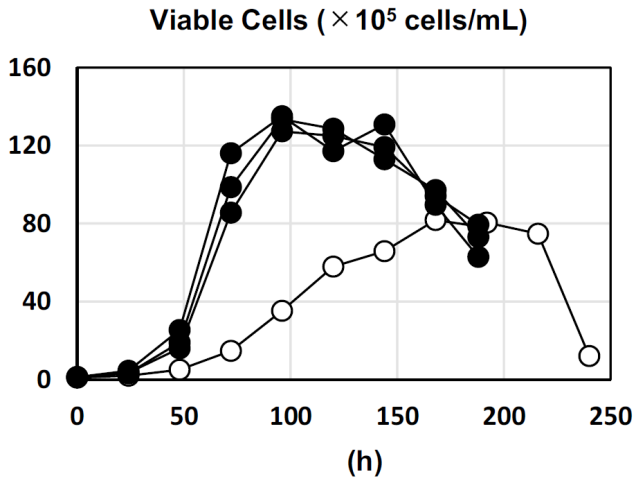

Figure 1 – Time course of CHL-YN and CHO-K1 cells[1)]

Closed circle: CHL-YN cells, Open Circle: CHO-K1 cells

The time courses of CHL-YN and CHO-K1 cells using serum-free medium were shown in Fig.1. As shown in this figure, the doubling time of CHL-YN was 10.5 hours in animal component-free chemically defined medium. From the cell cycle assay by Cell-Clock Cell Cycle Assay Kit (Biocolor), it was suggested that the CHL-YN cells have shorter G0/G1 cell cycle phase, because there are lower percentage of G0/G1 cells compared to CHO-K1 cells. The CHO-MK cells also showed a similar doubling time. In the presentation, we would like to show the therapeutic antibody production using CHO-MK cells attaining 7g/L at 7 days in 2L-fed-batch cultivation and the metabolites analysis of CHL-YN cell line.

1.Yamano-Adachi et al., Scientific Reports 10:17612 (2020) DOI: 10.1038/s41598-020-74735-0