# LUXCELL Fetal Bovine Serum (FBS) Functional Testing: Cell Growth Curve

## Experiment Background:

Fetal bovine serum (FBS) is the most widely used growth supplement in cell culture media, containing various embryonic growth-promoting factors. When used at an appropriate concentration, it can meet the specific metabolic needs of cell culture. The evaluation of FBS quality not only requires attention to various physiological and biochemical indicators but also to functional testing, which assesses its ability to support cell growth and function in culture. Cell growth curve measurement is one of the effective methods for evaluating FBS performance, providing a quantitative assessment of cell growth, understanding cell growth dynamics, and determining the cell population doubling time and cell cycle, which reflect the serum quality.

In this experiment, in collaboration with the Suzhou University Cambridge-Suda Genomics Resource Center, LUXCELL FBS and imported serum G were used for the revival and passaging of hamster ovary cells (CHO) and rat bone marrow mesenchymal stem cells (BMSC) to assess the cell growth capacity of LUXCELL premium fetal bovine serum. This was done by measuring cell growth curves at different cell densities using the CCK-8 assay.

## Experimental Method:

1. The cell lines to be tested were grouped according to the required culture media and thawed from liquid nitrogen. After thawing, the cells were split into two parts, each cultured in media containing one of two different sera and plated in 6-well plates.
2. After two passages, cells were digested with trypsin, centrifuged to remove the supernatant, and the cells were resuspended in media with the corresponding serum. The cell count was determined, and the cell density was adjusted to 0.5 × 10^4 cells/ml and 1.0 × 10^4 cells/ml.
3. The cells were plated into 96-well plates at the appropriate density, with 100 µl of the cell suspension per well (500 and 1000 cells per well), and 3 replicate wells were prepared for each condition, using 4 plates of 96 wells (the outermost row of the 96-well plates was left empty and filled with PBS to reduce evaporation errors). A total of 12 wells per cell line were plated, with 5 different cell lines per plate.
4. Cells in the 96-well plates were cultured for 24, 48, 72, and 96 hours, and the CCK-8 assay was performed at each time point. The culture medium was replaced every 2 days,

and 10 µl of CCK-8 reagent was added to each well at the time of testing. The plates were incubated for 2 hours in a 37°C, 5% CO2 incubator. Absorbance at 450 nm was measured using a microplate reader, and the data were recorded.

## Results and Discussion:

Five cell lines, including CHO cells, L929 cells, U2OS cells, MEF cells, and BMSC cells, were selected for this study. After thawing and passaging to the third generation, cells were plated at different densities in 96-well plates and cultured for 96 hours. At each time point, CCK-8 assays were performed, and absorbance (OD) values were recorded. The results showed that the growth ability of cells in LUXCELL premium FBS was comparable to the positive control and, in some cases, superior to imported serum G.

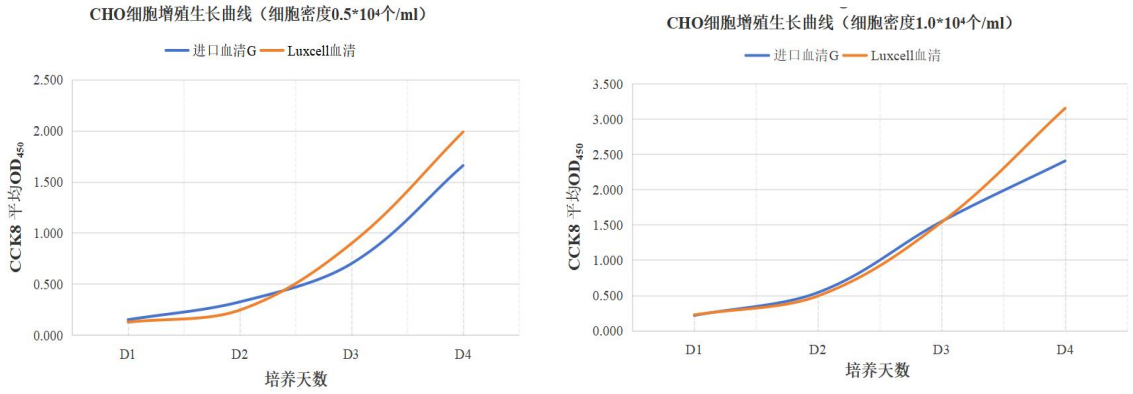


**Figure 1**: Comparison of cell growth curves in CHO cells between LUXCELL FBS and imported serum G at cell concentrations of 0.5 × 10^4/ml and 1.0 × 10^4/ml. Each group had at least 3 replicates, and all data are the average OD values.

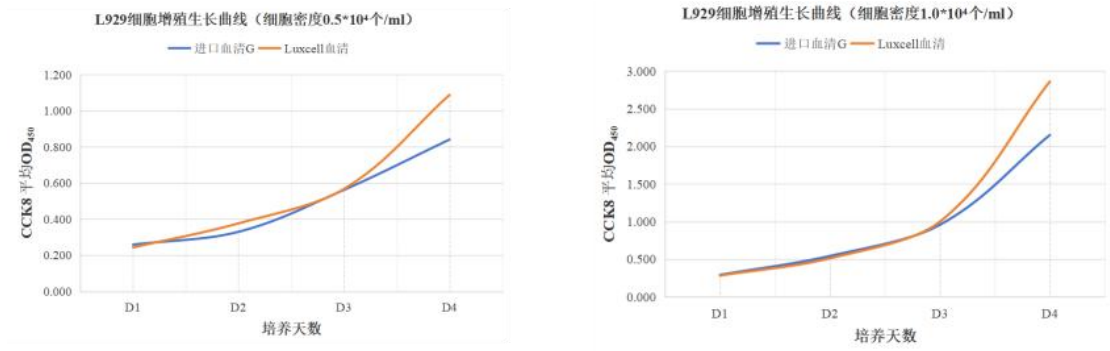


**Figure 2**: Comparison of cell growth curves in L929 cells between LUXCELL FBS and imported serum G at cell concentrations of 0.5 × 10^4/ml and 1.0 × 10^4/ml. Each group had at least 3 replicates, and all data are the average OD values.

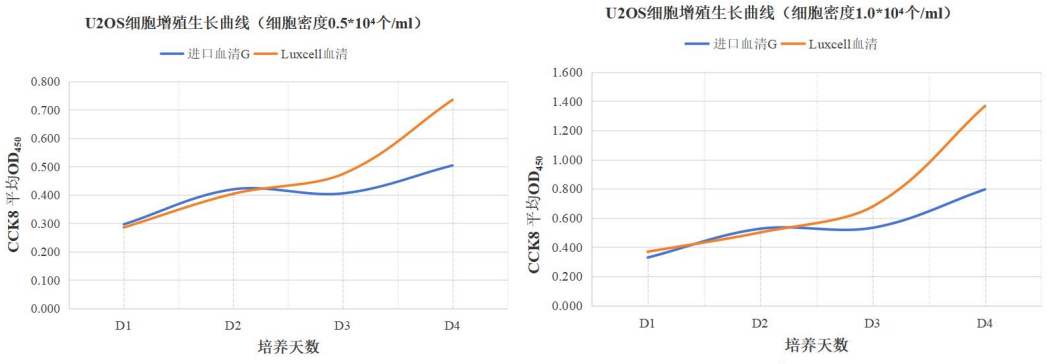


**Figure 3**: Comparison of cell growth curves in U2OS cells between LUXCELL FBS and imported serum G at cell concentrations of 0.5 × 10^4/ml and 1.0 × 10^4/ml. Each group had at least 3 replicates, and all data are the average OD values.

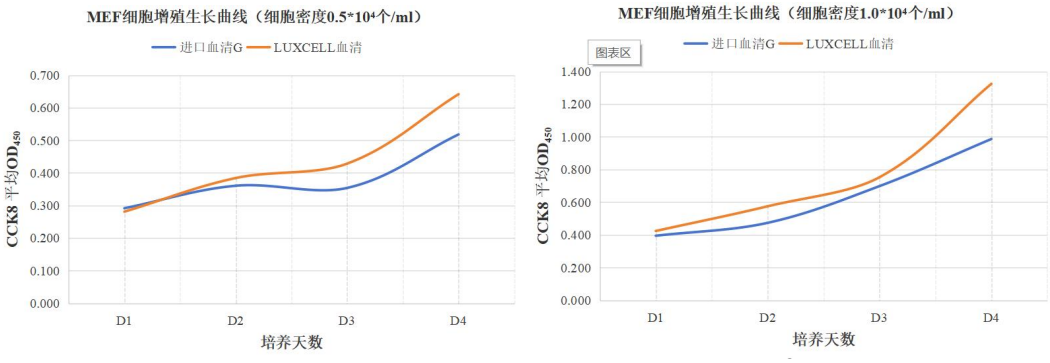


**Figure 4**: Comparison of cell growth curves in MEF cells between LUXCELL FBS and imported serum G at cell concentrations of 0.5 × 10^4/ml and 1.0 × 10^4/ml. Each group had at least 3 replicates, and all data are the average OD values.

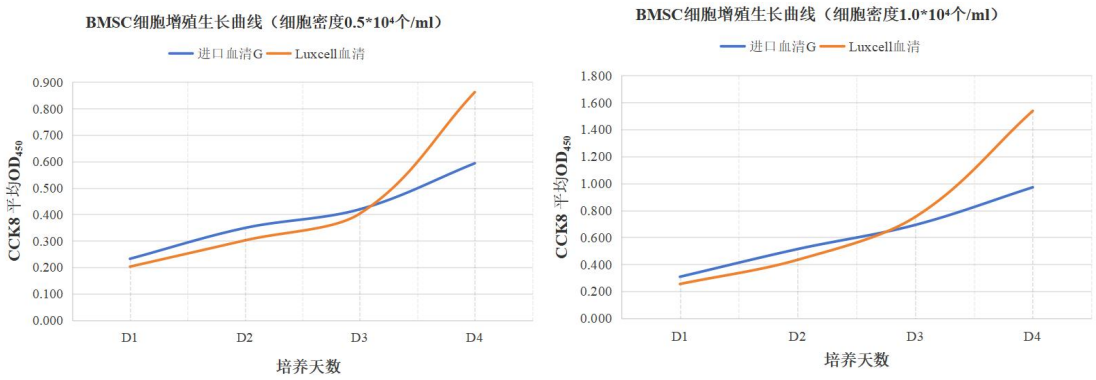


**Figure 5**: Comparison of cell growth curves in BMSC cells between LUXCELL FBS and imported serum G at cell concentrations of 0.5 × 10^4/ml and 1.0 × 10^4/ml. Each group had at least 3 replicates, and all data are the average OD values.

## Conclusion:

This study compared the cell growth curves of LUXCELL premium FBS and imported serum G. Using CHO, L929, U2OS, MEF, and BMSC cell lines, cells were revived and passaged, and their growth was monitored over 96 hours using the CCK-8 assay. The results indicated that LUXCELL premium FBS showed comparable, and in some cases superior, cell growth-promoting ability to the control serum. Therefore, LUXCELL FBS demonstrates excellent performance in supporting cell growth in culture, comparable to, and even exceeding, imported serum G.