REAL-TIME BIOPROCESS AND AUTOMATED FEED CONTROL WITH IN-LINE RAMAN SENSOR

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Biological and cell therapy products have complex manufacturing processes, the high R&D and production costs, resulting in unstable product quality. How to reduce manufacturing costs and maintain quality is extremely important for the development of biological and cell therapy products. Therefore, the real-time analytics will be the key to improve the bioprocess optimization of cell culture. This project uses Raman spectra as a sensor for real-time monitoring to directly detect cell culture growth and metabolism profile. It can respond to cell production conditions in time and adjust cell cultivation at any time, but no need of manual sampling for off-line analysis. This project is expected to use Raman spectra and multivariate algorithms in monitoring the culture process of the DCB proprietary CHO-C cells and T cell line. A single Raman sensor can be used to monitor (in-line) CHO-C viability cell density, glucose, lactate ammonia and glutamine. In 5L bioreactor, the glucose concentration will be automated feed with real-time Raman spectra control. Last, we will applied an IgG based mAb expressing CHO-C clone into the continuous perfusion process. Real-time bioprocess and automated feed control will shorten the process development timeline and improve product quality.