

A Primer on High Throughput 'Omics Technologies

An ArrayXpress Application Note
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-  **Increased** process stability
-  **Improved** bioproduction efficiency
-  **Efficient** cell line development
-  **Predictable** scalability
-  **Higher** quality recombinant proteins

High Throughput 'Omics Technologies are now being used to conduct quantitative bioprocess optimization. Using a SYSTEMS BIOLOGY approach, the constituting multi-omic components and their interactions, are computationally evaluated to reveal the properties of a bioprocess production system. This information provides the knowledge to optimize the performance and stability of your system.

'Omics Technologies

Genomics: Unravel the sequence of individual genes, gene regions, or whole genomes. It associates phenotypes with genotypes and characterizes epigenetic modifications. Whole genome DNA sequences provide the entryway to global assessment of any host cell system, from bacterial to mammalian.

Transcriptomics: Characterize both the quantitative and qualitative RNA profile of your bioprocess production system at a specific time. Evaluate changes not only in gene expression, but also alternatively spliced gene transcripts, gene fusions, SNVs, and other mutations.

Proteomics: Reveal the global protein expression. Profile the proteins in your system and their role in cellular activities and post-translational regulation of gene expression.

Metabolomics: Understand the unique chemical landscape of your production organism. Identify changes in metabolic pathways that are connected with specific gene activities.

Epigenomics: Identify the small non-coding RNA species in your system and characterize their regulatory effect on gene expression. Explore how histone modifications and DNA methylation affect gene expression in your production organism.

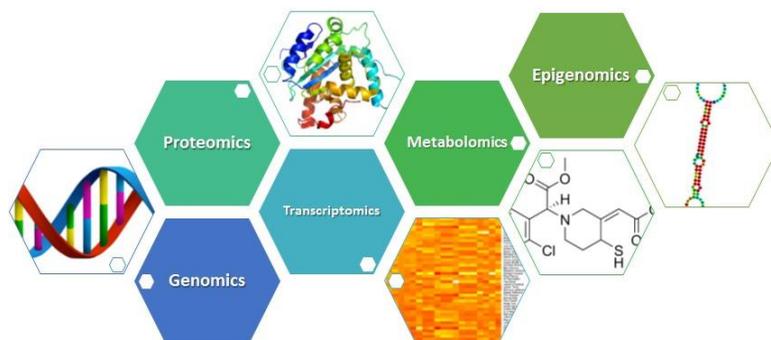
Comprehend the Cellular Biology of the Host Organism

Early Stage

High throughput 'Omics technologies aid in cell line development and improvement through site-specific engineering strategies. They also benefit process development and optimization through the development of predictive models to assist with media formulations and optimization of cell culture processes.

Late Stage

High throughput 'Omics technologies allow the development of markers that can be used to monitor downstream processes and assist production scale-up. In line with FDA's PAT and QbD initiatives, this ultimately improves Quality Control, Quality Assurance, and Regulatory Compliance.



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Contact the Experts

Our experienced scientific team can assist you in selecting, designing and developing a customized pipeline, in a cost-effective manner and with the highest quality standards to accelerate your efforts in bioprocess optimization.