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Intensified manufacturing culture media development considerations

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Such new initiatives as integrated continuous bioprocessing are inspiring new intensified manufacturing approaches including high-cell density perfusion culture. These culture formats can change basic culture parameters resulting in altered cycle rates and metabolic demands by the cultured cells. This can place unique compositional, temporal or physicochemical demands upon the culture media. Furthermore, there are a number of distinct high cell density (or concentrated) perfusion-based processes in development or current use. Modern development strategies must consider perfusion-unique phenomena as providing distinct process-specific demands for primary metabolites/growth factors, volume/schedule/storage, materials costs and definitions of performance. Tools to accomplish this include such modern equipment as mini-bioreactors, techniques as metabolic flux analysis and development algorithms (such as DoE). Finally, it is becoming clear that these new approaches to bio-manufacturing require a new look at not only process control strategies, but the implications of such historical culture quality-surrogate monitoring values as cell division and glucose or oxygen uptake rates.

Biography

William G Whitford is Sr. Manager, Cell Culture, GE Healthcare in Logan, UT with over 20 years' experience in biotechnology product and process development. He joined the company 13 years ago as a team leader in R&D developing products supporting biomass expansion, protein expression and virus secretion in mammalian and invertebrate cell lines. Products he has commercialized include defined and animal product-free hybridoma media, fed-batch supplements, and aqueous lipid dispersions. An invited Lecturer at international conferences, he has published over 250 articles, book chapters and patents in a number of fields in the bioproduction arena. He now enjoys such industry activities as serving on the editorial advisory board for BioProcess International.

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