

Report: A Review of Solid-Liquid Separation Technology and Applications in BioPharmaceutical Applications - April 2005

Abstract

The current status of process centrifugation is reviewed from a biopharmaceutical industry perspective, with the following four sections:

Section 1 focuses on: centrifugation technology, classes of centrifuges, key centrifuge manufacturers, and current products that are applied to bioprocessing. The effects of shear and its control via the latest process centrifuge designs are covered in detail. Scaling relationships are reviewed for the principal centrifuge types.

Section 2 is devoted to the status of centrifugation in biopharmaceutical applications. Batch cell culture receives particular emphasis, as does the role of disc stack centrifuges in cell culture applications. Performance variability of centrifuges in cell culture is discussed at length. Other applications discussed include: *E. coli*, yeast, perfusion culture, transgenics, vaccines, plasma fractionation, and cell and gene therapies. Strengths and weaknesses of centrifugation and competing technologies are presented for each of the applications, as are trends and new developments. Section 2 further covers limitations of scalability with respect to process centrifuges.

Section 3 highlights opportunities and threats to both process centrifugation and membrane filtration, particularly those perceived to have the greatest potential impact.

Section 4 presents a more far-ranging view of potential future developments, including the possibility of a new centrifuge class designed "from scratch" for batch cell culture. Another area that this section addresses is adaptation of the latest advances in on-line particle monitoring to feedback control of process centrifuges, potentially reducing performance variability.

About the authors

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