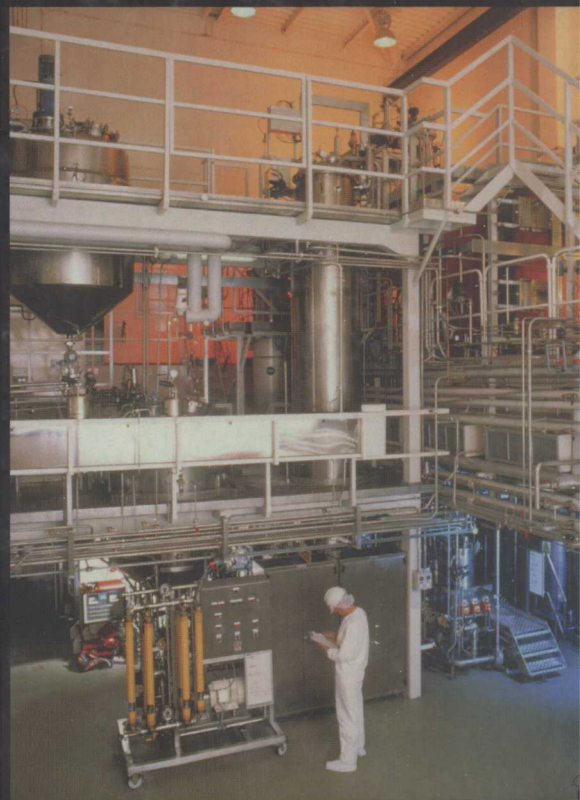


VOLUME 1



UPSTREAM INDUSTRIAL BIOTECHNOLOGY

Expression Systems and Process Development

MICHAEL C. FLICKINGER, EDITOR

 WILEY

UPSTREAM INDUSTRIAL BIOTECHNOLOGY

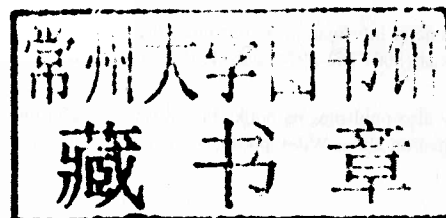
Expression Systems and Process Development

Volume 1

Edited By

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PREFACE

Upstream Industrial Biotechnology is a compilation of essential in depth articles, organized topically and listed in alphabetical format, for biopharmaceutical, bioprocess and biologics process scientists, engineers and regulatory professionals from the comprehensive seven volumes of the *Encyclopedia of Industrial Biotechnology*. Process development for the manufacture of complex biomolecules involves solving many scientific, compliance and technical problems quickly in order to support pilot, preclinical and clinical development, technology transfer and manufacturing start-up. Every organization develops new processes from accumulated process knowledge. Accumulated process knowledge has a very significant impact on accelerating the time to market (and reducing the financial resources required) of products manufactured using recombinant DNA and living microbes, cells, transgenic plants or transgenic mammals. However, when an entirely new upstream platform is needed, there are few books that will quickly provide the depth of industry-relevant background. *Upstream Industrial Biotechnology* can fill this void as a 2 volume advanced desk reference. These volumes include relevant biology, protein purification and

engineering literature with abundant process examples provide by industry subject matter experts (SMEs) and academic scholars. This desk reference will also be useful for advanced biomanufacturing students and professionals to quickly gain in depth knowledge on how to design processes (and facilities) capable of being licensed to manufacture enzymes, biopharmaceutical intermediates, human and veterinary biopharmaceuticals or vaccines. The opportunity is yours to leverage the combined knowledge from scores of industry professionals from around the world who have contributed to *Upstream Industrial Biotechnology* to reduce the time and cost to deliver engineered proteins, biomolecules and cost-effective biologics to the market and especially to millions of patients worldwide.

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