



Introduction to Biomanufacturing

*Northeast Biomanufacturing
Center & Collaborative*



*GLOBAL
BIOMANUFACTURING
CURRICULUM*

Introduction to Biomanufacturing

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Foreword

Today is a time of unparalleled excitement in the world of biopharmaceuticals. What were largely unknown to the general public only 20 years ago, biologically derived drugs, have become enormously popular. The National Institutes of Health and IMS Health have both published studies suggesting that biologics will comprise one-fifth of the total drug market by 2015.

The timeline of biomanufacturing is very discontinuous. Though humans used principles of biotechnology since they first saved the seeds of high-producing plants (natural selection), it was really not for about the next 9000 years that this knowledge advanced appreciably. There is a complex world of microbes all around us. The empirical research to first identify germs and their causal relationship with disease was provided by Louis Pasteur. He famously stated “*La génération spontanée est une chimère,*” (The spontaneous generation [of microorganisms] is a fantasy); this idea made clear that microorganisms do not come from nothing. This can be rephrased in Latin as “*Omne vivum ex vivo,*” (all life is from life). This was an incredible paradigm shift, and since Pasteur’s innovative ideas, humanity has worked incredibly quickly to understand, modify, and harness the microbiological world to improve our lives. What we do as scientists and thought leaders in this industry is to ensure that our future continues to bring us a substantial number of rich insights and valuable technologies. The work we do speaks a great deal about our desire to achieve something bigger for humanity; the lives we lead have purpose, and this book is testament to the fact that part of that purpose is improving our collective health and well-being through the application of good science.

The book that you hold is a compendium of a tremendous body of knowledge, distilled into its most essential parts. I know of no other text that strikes such a fine balance of breadth and depth in its contents on the topic. Not only are there theoretical and conceptual ideas about biopharmaceutical manufacturing, but also content specific to skills and abilities. It serves as a well-paced guide for beginning learners as well as a cogent reference for seasoned biotechnology professionals alike.

As the industry continues to grow, we need more bright minds to keep pushing the envelope. It is my hope with this book that a new generation of students can be inspired and familiarize themselves with the theories, principles, and vernacular of biopharmaceutical production and all that it entails. I can think of no others more appropriate to develop this reference text than Sonia Wallman and the NBC² team; Sonia has worked tirelessly to open the eyes of students to the biopharmaceutical sciences, and in the process has earned the admiration and respect of countless people.

On behalf of Sonia and the team, I hope you find this text an engaging and rewarding read.

Ben Locwin
Portsmouth, New Hampshire
June 2012

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