1. Record Nr. UNINA9910797367603321

Titolo	Industrialization of biology : a roadmap to accelerate the advanced manufacturing of chemicals / / Committee on Industrialization of Biology: A Roadmap to Accelerate the Advanced Manufacturing of Chemicals, Board on Chemical Sciences and Technology, Board on Life Sciences, Division on Earth and Life Studies, National Research Council of the National Academies
Pubbl/distr/stampa	Washington, District of Columbia : , : The National Academies Press, , [2015] ©2015
ISBN	0-309-31655-3 0-309-31653-7
Descrizione fisica	1 online resource (176 p.)
Disciplina	660.63
Soggetti	Biotechnology industries Chemical industry - Technological innovations Chemical industry - United States Biotechnology industries - United States United States
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Front Matter; Preface; Acknowledgment of Reviewers; Contents; Summary; 1 Introduction and Context; 2 Industrial Biotechnology: Past and Present; 3 Vision of the Future: What New Chemicals Could Be Made?; 4 How Do We Get There?; 5 What Is Success and How to Get There: Recommendations; References; Appendix A: Glossary; Appendix B: The Current Regulatory Framework; Appendix C: Committee Member and Staff Biographies; Appendix D: Workshop Agenda and Attendees; Figures S-1 and 5-1 (foldout)
Sommario/riassunto	"The tremendous progress in biology over the last half century - from Watson and Crick's elucidation of the structure of DNA to today's astonishing, rapid progress in the field of synthetic biology - has positioned us for significant innovation in chemical production. New

bio-based chemicals, improved public health through improved drugs and diagnostics, and biofuels that reduce our dependency on oil are all results of research and innovation in the biological sciences. In the past decade, we have witnessed major advances made possible by biotechnology in areas such as rapid, low-cost DNA sequencing, metabolic engineering, and high-throughput screening. The manufacturing of chemicals using biological synthesis and engineering could expand even faster. A proactive strategy - implemented through the development of a technical roadmap similar to those that enabled sustained growth in the semiconductor industry and our explorations of space - is needed if we are to realize the widespread benefits of accelerating the industrialization of biology. Industrialization of Biology presents such a roadmap to achieve key technical milestones for chemical manufacturing through biological routes. This report examines the technical, economic, and societal factors that limit the adoption of bioprocessing in the chemical industry today and which, if surmounted, would markedly accelerate the advanced manufacturing of chemicals via industrial biotechnology. Working at the interface of synthetic chemistry, metabolic engineering, molecular biology, and synthetic biology, Industrialization of Biology identifies key technical goals for next-generation chemical manufacturing, then identifies the gaps in knowledge, tools, techniques, and systems required to meet those goals, and targets and timelines for achieving them. This report also considers the skills necessary to accomplish the roadmap goals, and what training opportunities are required to produce the cadre of skilled scientists and engineers needed."--