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Nota di contenuto	In Memoriam; Contents; Foreword; Chapter 1. Introduction; Defining Dual Use; The Dual-Use Landscape, Past and Present; The Rise of Synthetic Genomics; Technical Hurdles to Bioterrorism; The Changing Nature of Security Threats; Harm versus Misuse; Misuse Scenarios; Structure of the Book; Acknowledgments; Notes; Part I. Assessing and Managing Dual-Use Risks; Chapter 2. Review of the Literature on Dual Use; Assessing Uncertain Risks; Dual Use as a Societal Process; Approaches to Technology Governance; International Governance Regimes; Conclusions; Notes Chapter 3. Current Dual-Use Governance Measures Arms Control and Disarmament Treaties; National Biosafety and Biosecurity Measures; Soft-Law and Informal Measures; Conclusions; Notes; Chapter 4. The Decision Framework; Technology Monitoring; Technology Assessment; Selection of Governance Measures; Testing the Decision Framework; Conclusions; Notes; Part II. Contemporary Case Studies; A. Technologies for the Acquisition of Novel Biological or Molecular

Diversity; Chapter 5. Combinatorial Chemistry and High-Throughput Screening; Overview of the Technology; Potential for Misuse Characteristics of the Technology Relevant to Governance Conclusions; Notes; Chapter 6. DNA Shuffling and Directed Evolution; Overview of the Technology; Potential for Misuse; Characteristics of the Technology Relevant to Governance; Conclusions; Acknowledgments; Notes; B. Technologies for Directed Design; Chapter 7. Protein Engineering; Overview of the Technology; Potential for Misuse; Characteristics of the Technology Relevant to Governance; Conclusions; Notes; Chapter 8. Synthesis of Viral Genomes; Overview of the Technology; Potential for Misuse Characteristics of the Technology Relevant to Governance Conclusions; Notes; Chapter 9. Synthetic Biology with Standard Parts; Overview of the Technology; Potential for Misuse; Characteristics of the Technology Relevant to Governance; Conclusions; Notes; C. Technologies for the Manipulation of Biological Systems; Chapter 10. Development of Psychoactive Drugs; Overview of the Technology; Potential for Misuse; Characteristics of the Technology Relevant to Governance; Conclusions; Notes; Chapter 11. Synthesis of Peptide Bioregulators; Overview of the Technology; Potential for Misuse Characteristics of the Technology Relevant to Governance Conclusions; Notes; Chapter 12. Immunological Modulation; Overview of the Technology; Potential for Misuse; Characteristics of the Technology Relevant to Governance; Conclusions; Notes; Chapter 13. Personal Genomics; Overview of the Technology; Potential for Misuse; Characteristics of the Technology Relevant to Governance; Conclusions; Notes; Chapter 14. RNA Interference; Overview of the Technology; Potential for Misuse; Characteristics of the Technology Relevant to Governance; Conclusions; Notes Chapter 15. Transcranial Magnetic Stimulation

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## Sommario/riassunto

Recent advances in disciplines such as biotechnology, nanotechnology, and neuropharmacology entail a "dual-use dilemma" because they promise benefits for human health and welfare yet pose the risk of misuse for hostile purposes. The emerging field of synthetic genomics, for example, can produce custom DNA molecules for life-saving drugs but also makes possible the creation of deadly viral agents for biological warfare or terrorism. The challenge for policymakers is to prevent the misuse of these new technologies without forgoing their benefits. Innovation, Dual Use, and Security offers a systematic approach for managing the dual-use dilemma. The book presents a "decision framework" for assessing the security risks of emerging technologies and fashioning governance strategies to manage those risks. This framework is applied to fourteen contemporary case studies, including synthetic genomics, DNA shuffling and directed evolution, combinatorial chemistry, protein engineering, immunological modulation, and aerosol vaccines. The book also draws useful lessons from two historical cases: the development of the V-series nerve agents in Britain and the use and misuse of LSD by the U.S. Army and the CIA. Innovation, Dual Use, and Security offers a comprehensive, multifaceted introduction to the challenges of governing dual-use technologies in an era of rapid innovation. The book will be of interest to government officials and other practitioners as well as to students and scholars in security studies, science and technology studies, biology, and chemistry.

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