1. Record Nr. UNINA9911049083803321

Autore	Chaplain M. A. J
Titolo	Mathematical Oncology / / by Mark A. J. Chaplain, Luigi Preziosi
Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 2025
ISBN	0-387-68564-2
Edizione	[1st ed. 2025.]
Descrizione fisica	1 online resource (1181 pages)
Collana	Interdisciplinary Applied Mathematics, , 2196-9973 ; ; 62
Disciplina	570.285
Soggetti	Biomathematics Immunology Internal medicine Physiology Mathematical and Computational Biology Internal Medicine Animal Physiology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Preface -- Biology/Pathology of Cancer -- Modeling the Immune Response to Cancer -- Simple Models of Tumor Growth -- Modeling Avascular, Multicellular Spheroid Growth -- Pre-pattern Models of Tumor Growth -- Modeling Tumor-induced Angiogenesis -- Modeling Invasion and Metastasis -- Mechanical Models of Growth -- Index.
Sommario/riassunto	Cancer is a complex and devastating disease, responsible for millions of deaths worldwide each year. While traditional oncology focuses on diagnosis and treatment through medical, surgical, radiation and clinical techniques, mathematical oncology has emerged as a powerful discipline that applies mathematical modelling to understand cancer growth, spread, and response to treatment. This volume provides a comprehensive exploration of mathematical approaches in oncology, offering a deep dive into differential equation models and biomechanical models. From reaction-diffusion equations that capture tumour growth and spread, to mechanical models that examine cellular interactions within tissues and vessels, this book presents both analytical techniques and computational modelling approaches that enhance our understanding of cancer dynamics. This book serves as

both a reference for researchers and a foundation for integrating mathematical oncology into university curricula. By bridging the gap between mathematics, biology, and clinical research, it highlights the crucial role of mathematical modelling in advancing cancer treatment strategies and improving patient outcomes.