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Nota di contenuto	Incorporating Asymmetric Stem Cell Division into the Roeder Model for Chronic Myeloid Leukemia -- A Cellular Automata and a Partial Differential Equation Model of Tumor-Immune Dynamics and Chemotaxis -- A Structured Population Model of Competition between Cancer Cells and T Cells under Immunotherapy -- Modeling Tumor-Immune Dynamics -- The Mathematics of Drug Delivery -- The Role of the miR-451-AMPK Signaling Pathway in Regulation of Cell Migration and Proliferation in Glioblastoma -- An Optimal Control Approach to Cancer Chemotherapy with Tumor-Immune System Interactions --

Negative feedback regulation in hierarchically organized tissues: Exploring the dynamics of tissue regeneration and the role of feedback escape in tumor development -- A Cellular Automata Model to Investigate Immune Cell-Tumor Cell Interactions in Growing Tumors in Two Spatial Dimensions -- Differential Equation Techniques for Modeling a Cycle-Specific Oncolytic Virotherapeutic.

Sommario/riassunto

This collection of papers offers a broad synopsis of state-of-the-art mathematical methods used in modeling the interaction between tumors and the immune system. These papers were presented at the four-day workshop on Mathematical Models of Tumor-Immune System Dynamics held in Sydney, Australia from January 7th to January 10th, 2013. The workshop brought together applied mathematicians, biologists, and clinicians actively working in the field of cancer immunology to share their current research and to increase awareness of the innovative mathematical tools that are applicable to the growing field of cancer immunology. Recent progress in cancer immunology and advances in immunotherapy suggest that the immune system plays a fundamental role in host defense against tumors and could be utilized to prevent or cure cancer. Although theoretical and experimental studies of tumor-immune system dynamics have a long history, there are still many unanswered questions about the mechanisms that govern the interaction between the immune system and a growing tumor. The multidimensional nature of these complex interactions requires a cross-disciplinary approach to capture more realistic dynamics of the essential biology. The papers presented in this volume explore these issues and the results will be of interest to graduate students and researchers in a variety of fields within mathematical and biological sciences.