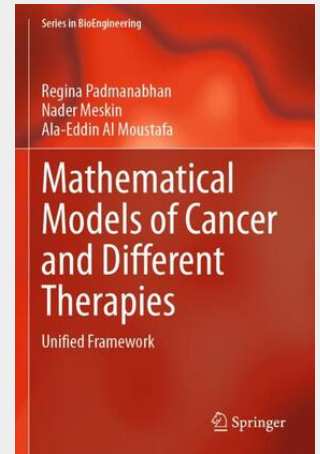


Mathematical Models of Cancer and Different Therapies

Unified Framework

This book provides a unified framework for various currently available mathematical models that are used to analyze progression and regression in cancer development, and to predict its dynamics with respect to therapeutic interventions. Accurate and reliable model representations of cancer dynamics are milestones in the field of cancer research. Mathematical modeling approaches are becoming increasingly common in cancer research, as these quantitative approaches can help to validate hypotheses concerning cancer dynamics and thus elucidate the complexly interlaced mechanisms involved. Even though the related conceptual and technical information is growing at an exponential rate, the application of said information and realization of useful healthcare devices are lagging behind. In order to remedy this discrepancy, more interdisciplinary research works and course curricula need to be introduced in academic, industrial, and clinical organizations alike. To that end, this book reformulates most of the existing mathematical models as special cases of a general model, allowing readers to easily get an overall idea of cancer dynamics and its modeling. Moreover, the book will help bridge the gap between biologists and engineers, as it brings together cancer dynamics, the main steps involved in mathematical modeling, and control strategies developed for cancer management. This also allows readers in both medical and engineering fields to compare and contrast all the therapy-based models developed to date using a single source, and to identify unexplored research directions.



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