

Special Issue on
**Mathematical Oncology: Unveiling
Biological Complexity Using
Mathematical Methods**

CALL FOR PAPERS

Recently, a new generation of mathematical and computational models of cancer has emerged, in close collaboration with experimentalists. They are primarily aimed at understanding aspects of cancer progression and treatment. A key to making these models clinically relevant is that they should incorporate essential disease mechanisms and employ patient specific data. The quality and quantity of these data vary wildly across tumor type and cover a wide range of spatiotemporal scales (e.g., molecular, cellular, tissular, organ, and organism scales). They are obtained from increasingly quantitative measurement techniques such as microarrays, bioluminescence, immunohistochemistry, or clinical imaging. To further complicate matters, most cancers have multiple therapeutic options, some with 20 or more. This produces a huge therapeutic parameter space with vast numbers of potential drug, dose, and schedule combinations. Therefore, a key challenge in this active developing field is how to best utilize limited patient data to produce clinically useful predictions that can both aid our understanding of this devastating disease and allow us to treat it better. On the other hand, from a theoretical point of view, mathematical models can shed light on main aspects of the dynamics of cancer and provide a better understanding of this complicated phenomenon. They provide a theoretical test bench for which one can compare their predictions with clinical observations.

In this special issue, we strongly encourage authors to submit their original studies in modeling, control, and mathematical analysis of tumor growth.

Potential topics include but are not limited to the following:

- ▶ Mathematical models of tumor-immune system interplay and immunotherapy
- ▶ Mathematical models of drug resistance
- ▶ Mathematical models of tumor heterogeneity
- ▶ Optimizing cancer chemotherapy and radiotherapy
- ▶ Specific mechanisms of tumor progression
- ▶ Mathematically derived biomarkers

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/complexity/moubc/>.

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Manuscript Due

Friday, 25 August 2017

First Round of Reviews

Friday, 17 November 2017

Publication Date

Friday, 12 January 2018