Computational Models of Pancreatic Cancer

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Letter to Editor

There have been significant efforts recently to bring the knowledge and methods used in physical sciences into oncology, in an effort to improve the outcomes for patients with malignancies. "Computational Oncology" uses computational methods and analysis to better understand the genesis of malignancies, as well as to optimize therapeutic approaches. There are three basic approaches including mechanistic models which model individual cellular processes, cellular models which bring together mechanistic models to model the whole cell, and descriptive models to model tumor growth in a patient [1]. Each of these has their advantages and disadvantages, and each of these can provide insight into the mechanisms of tumor growth and metastasis.

Our research is focused on a descriptive model, using diffusion and proliferation terms to understand the growth of tumors in a patient. This model has been adapted from a model developed for glioblastoma multiforme, which has been successfully applied clinically [2]. As this model is developed, we are planning to apply it to the growth of hepatic metastases from pancreatic cancer.

References

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2. Baldock AL, Rockne RC, Boone AD, Neal ML, Hawkins-Daaraud A, Corwin DM, et al. From patient specific mathematical neuro-oncology to precision medicine. *Front Oncol.* 2013;3:62.