



Mathematical Biology Seminar



Monday, January 11, 2010

3 pm – 357 CAB *(note change of location)*

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*A New Tumor Control Probability Model Based On Cell Population Models**

Tumor Control Probability (TCP) is the probability that no tumor cells exist after treatment. It is used to measure the efficacy of radiation treatment and for treatment optimization. The simplest TCP models are based on statistical distributions such as Poisson distribution and Binomial distribution. More sophisticated TCP models are based on birth-death processes (Zaider et. al. '00, Dawson et. al. '06). These TCP formulas can be computed directly from cell population models which are differential equations for the mean expected tumor cell numbers.

In this talk, I will present the derivation of the above TCP models based on a linear cell cycle population model (using master equation, generating function, hyperbolic systems). Then we will use these models to study six typical treatment protocols for prostate cancer. We find that the TCP for hyperfractionated schedules are the same as their corresponding standard treatment; and that the quiescent cells will reduce the tumor radiosensitivity to the treatment.

* *Collaborators: T. Hillen, G. de Vries, C. Finlay*

Join us for refreshments in CAB 549 immediately following the Seminar

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