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# Mathematical analysis and simulations involving chemotherapy and surgery on large human tumours under a suitable cell-kill functional response

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## **Mathematical analysis and simulations involving chemotherapy and surgery on large human tumours under a suitable cell-kill functional response**

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**Abstract.** Dosage and frequency of treatment schedules are important for successful chemotherapy. However, cell-kill response and tumoral growth should not be seen as separate and therefore are essential in cancer modeling. Concerning this issue, and under a suitable cell-kill dynamics, in this talk I will present a mathematical model for sequencing of cancer chemotherapy and surgery of large human tumours. Biological and pharmacological data are used in a numerical approach, where drug administration occurs in cycles (periodic infusion) and surgery is performed instantaneously. Considering a continuous chemotherapeutic drug administration, a stability analysis is also presented. In according to Norton & Simon hypothesis, our results indicate that chemotherapy is less efficient in treating tumours that have reached a plateau level of growing and that a combination with surgical treatment can provide better outcomes.

**Reference:** Mathematical analysis and simulations involving chemotherapy and surgery on large human tumours under a suitable cell-kill functional response. *Mathematical Biosciences and Engineering*, v. 10, p. 221-234, 2013 - <http://dx.doi.org/10.3934/mbe.2013.10.221>