TWO OPTIMAL CONTROL PROBLEMS IN CANCER CHEMOTHERAPY WITH DRUG RESISTANCE[*]

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Abstract

We investigate two well-known basic optimal control problems for chemotherapeutic cancer treatment modified by introducing a time-dependent "resistance factor". This factor should be responsible for the effect of the drug resistance of tumor cells on the dynamical growth for the tumor. Both optimal control problems have common point-wise but different integral constraints on the control. We show that in both models the usually practised bang-bang control is optimal if the resistance is sufficiently strong. Further, we discuss different optimal strategies in both models for general resistance.

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1   Introduction

Optimal control problems based on mathematical models for cancer chemo-therapy have a long history and obtained a renewed interest in the last years

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