Could the HAART Therapy Reduce the Latent Infected $CD4^+$ Reservoir ? Optimal Control Approach

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In HIV infection, the latent cells represent a reservoir that contribute to the of failure of the Highly Active Anti-Retroviral Therapy (HAART). Which required to investigate of the possible strategy to improve the administration of this therapy in order to grantee controlling the infection as long as possible. For this propose, we aim, in this work, to study the possibility of reducing the latent infected $CD4^+$ reservoir for the HIV infection by considering a mathematical model of two types of latently infected CD4+, fast and slow, and eight virus strains: wild-type, three single mutants, three double mutants and a fully resistant triple mutant. In this model, we consider the HAART therapy as optimal control problem that reduces the amount of virus in HIV patient and the infected cells. Our optimal control approach examines the effect of such therapy of the other type of infected cells that have big impact on the persistence of the infection and mutation of the drug resistance and sensitivity.

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