Mathematical Methods and Models in Biosciences
June 18-23, 2023, Pomorie, Bulgaria
https://biomath.math.bas.bg/biomath/index.php/bmcs

Mathematical model of CAR-T therapy taking into account cells targeting off-tumour antigens

Marek Bodnar[1], Urszula Foryś[1], Monika J. Piotrowska[1], Mariusz Bodzioch[2], Jose A. Romero-Rosales[3], Juan Belmonte-Beitia[3]

[1]Institute of Applied Mathematics and Mechanics, University of Warsaw, Poland
mbodnar@mimuw.edu.pl
urszula@mimuw.edu.pl
monika@mimuw.edu.pl

[2]Faculty of Mathematics and Computer Science, University of Warmia and Mazury in Olsztyn, Poland
mariusz.bodzioch@matman.uwm.edu.pl

[3]Mathematical Oncology Laboratory (MOLAB), University of Castilla-La Mancha, Spain
joseantonio.romero@uclm.es
juan.belmonte@uclm.es

In [1] two mathematical models of CAR-T (Chimeric Antigen Receptor T) cell therapy were presented. The results of this therapy against leukaemias and lymphomas were positive [2, 3], but in the case of solid tumours, including glioblastoma the results were less optimistic [4, 5]. We will focus on the mathematical analysis of one of presented models, that takes into account CAR-T cells targeting no-tumour and off-tumour antigens. The system consist of four ordinary differential equations. In [1] only an initial dose of CAR-T cell treatment was considered. We consider two kind of treatments: a constant one (which will be modelled by a source term of CAR-T cells) and periodic one (modelled by an impulsive differential equations). Basic mathematical properties of the model will be presented as well as an asymptotic dynamics of solutions will be discussed.

References

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