Krajowa Konferencja Zastosowań Matematyki w Biologii i Medycynie

Łochów, 23rd–27th September 2014

HEMATOPOIETIC STEM CELL BASED THERAPY OF IMMUNOSUPPRESSIVE VIRAL INFECTION – NUMERICAL SIMULATIONS

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ABSTRACT

Recent advantages in genetic engineering and stem cell research make gene therapies a more viable option for treating various diseases (*e.g.* AIDS, cancer). One of such therapies (see [2, 3]) utilizes hematopoietic stem cells (HSC) to engineer fully functional cytotoxic T lymphocytes (CTL) that specifically kill the infected tissue cells.

We have conducted a series of numerical simulations [1] to study how the influx of engineered virus-specific CTL influences the dynamics of immune response in different stages of infection. The outcome of our simulations shows that such a therapy should result in restoration of immune response, reduced T helper cell depletion and suppression of plasma viremia.

In our simulations, we have used a modified version of the basic model for virus-induced impairment of help [6]. The model was additionally studied mathematically [4] and then expanded to describe a single injection of genetically modified HSCs [5].

ACKNOWLEDGEMENTS

The author would like to express his gratitude to Mikhail Kolev for his helpful comments and suggestions.

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