

**Scientific report for the project PN-II-ID-PCE-2011-3-0571, period april – december
2012, Stage I**

Activities in this stage:

1. Experiments to get more biological data to be used in mathematical modeling. New data on the apoptosis, proliferation and the transfer of thymocytes between main subpopulations, and the dynamics of medullary and stromal cells of the thymus.
2. Generation of a mathematical model of the first stages of thymus regeneration and the inverted CD4+ single-positive/CD8+ single-positive ratio in the regenerated thymus.

Objective: to publish two ISI-indexed papers from these results with members of the project as principal authors.

Results:

1. In this stage we submitted to publication a paper that we got eventually approved on the dynamics of macrophages in the diabetic thymus. The main authors are members of the project.

Accumulation of tissue macrophages and depletion of resident macrophages in the diabetic thymus in response to hyperglycemia-induced thymocyte apoptosis.

Barbu-Tudoran L, Gavriliuc OI, Paunescu V, Mic FA.

Journal of Diabetes and its Complications. 2013 Mar-Apr;27(2):114-22.

2. We have completed and submitted to publication (at **Molecular Systems Biology**) another paper that deals with the mathematical modeling of glucocorticoid-induced thymus involution and regeneration. All authors are members of the project.

Mathematical modeling with perturbation functions of the drug's mechanism of action on thymocyte populations during glucocorticoid-induced thymus involution and regeneration.

Daniela Zaharie , Radu Dumitru Moleriu, Lavinia Cristina Moleriu, Ioan Nicolae Casu, Alexandra Teodora Gruia, Ani Aurora Mic Virgil Paunescu, Felix Aurel Mic.

3. We have presented a paper at SYNASC 2012, the 14th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, held at Universitatea de Vest Timisoara, Timisoara, between 26-29 september, 2012. All three authors are members of the project.

- Stability analysis and its impact on the parameters estimation for a logistic growth model.

Lavinia Moleriu, Radu Moleriu and Daniela Zaharie

4. We have presented a paper at “The 13th International Conference on Mathematics and its Applications ICMA2012”, Politechnica University of Timisoara, Romania, section Probability and Statistics. Applications in Health and Clinical Research, held in Timisoara, november 1-3, 2012. The author is a member of the project.

Inferring evolution models from experimental data on populations of thymocytes.

Lavinia Cristina Moatar-Moleriu

A handwritten signature in blue ink, appearing to be 'M. Aurel Felix', written in a cursive style.

Project manager, Dr. Mic Aurel Felix