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Research interests

- **Tumor cell biology and innovative cancer therapies**

Research in this field were first targeted on tumor-associated fibroblasts (TAFs) which we consider to be a subpopulation of mesenchymal stem cells originating in the bone marrow that appears to play an important role in tumor progression and metastasis. Isolation and complex characterization of tumor stem cells was also a topic of interest. We intend to expand the study of tumor microenvironment by using tissue constructs generated by 3D bioprinting techniques. Drawing on the results so far, we have started the study of chimeric antigen receptors of NK cells, in collaboration with the Technical University of Dresden, within the project "Chimeric antigen receptor targeted oncoimmunotherapy with natural killer cells"-CAR-NK (POC, P-37-786). The project aims to design a personalised anti-tumor therapy by developing new generation CAR-NKs able to recognize specific tumor antigens and to initiate tumor destruction.

- **Stem cell research for the development of regenerative therapies**

Our stem cells research first targeted the hematopoietic stem cells, being the coordinator of the Immunology team involved in the first autologous (2000) and allogeneic (2002) bone marrow transplant in Romania; we also performed the first Romanian pilot study regarding AC133 stem cell therapy in myocardial infarction. Research then extended on mesenchymal stem cells ~~then~~ and their therapeutic potential in regenerative medicine, our team being among the first to address this theme at national level. Internationally, I have led the Romanian research team participating in the "Adult Mesenchymal Stem Cells for Tissue Engineering Connective Disorders"-GENOSTEM project (FP6 integrated project). The project started with *in vitro* and animal studies that underpinned the use of stem cells in tissue regeneration, and was followed by two FP7 projects which designed and implemented clinical trials dedicated to mesenchymal stem cells advanced therapies: „Cultivated adult stem cells as alternative for damaged tissue” (CASCADE, FP7-223236) and „Regenerating bone defects using new biomedical engineering approaches” (REBORNE, FP7-241879). Several national projects have investigated the differentiation potential of these cells in various lineages applicable in the cardiovascular, ~~and~~ bone and joint reconstruction, as well as in the validation of molecular factors involved in these processes. We also conducted experiments on myocardial reconstruction based on repopulation of the fibrous matrix resulted from the heart decellularization with other various cell types. In 2016, we have obtained for the first time in our laboratory the human induced pluripotent stem cells (iPS) from reprogrammed T lymphocytes, which opens wide perspectives for the development of other cell types used in regenerative medicine.

Relevant publications

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3. Hadaruga NG, Hadaruga DI, **Paunescu V**, Tatu CA, Ordodi VL, Bandur G and Lupea AX. Thermal Stability of the Linoleic Acid/ α - and β -Cyclodextrin Complexes. Food Chemistry 2006, 99(3): 500-508. – 63 citări
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9. Orem WH, Tatu CA, Lerch III HE, Maharaj SVM, Pavlovic N, **Paunescu V**, Dumitrascu V. Identification and environmental significance of the organic compounds in water supplies associated with a Balkan endemic nephropathy region in Romania. J. Environ. Health Res. 2004, 3(2): 53-61. – 20 citări
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