Tumor diseases are the second in matter of frequency (after cardiovascular diseases) cause of death in developed countries. Additionally morbidity to tumor diseases is still increasing – for example among British morbidity to tumor diseases (without malignant skin tumors) has increased for approximately 3% during 2008-2010 in comparison to period 1999-2001, while among Britisher women this increase was twofold [1]. Epidemiological data obtained for EU in 2007 (based on Cancer Research UK The most commonly diagnosed cancers in the European Union 2007 http://info.cancerresearchuk.org/cancerstats/geographic/cancerineu/commoncancers/?a=5441) indicates colon tumors as most common in the population (the same data indicates lowest 5 year survival rate for Estonia and Poland). Simultaneously one of yet not solved problem is acquiring during chemotherapy invulnerability to chemotherapeutics agents, called multidrug resistance [2]. It is estimated that most of tumors after treatment develop resistance towards drugs used during first treatment (for example for breast cancer almost 75% of metastases for this disease develop MDR and for lung cancer almost all metastases are multidrug resistant. Among causes of this phenomenon there are many factors considered such as disorders in mechanism controlling apoptosis, changes in expression pattern of enzymes that are target for drugs, but one of the most common mechanism of MDR occurrence is overexpression of ABC protein – transmembrane transporters involved in elimination process of metabolites and xenobiotics (also drugs). Activity of these proteins leads to decrease concentration of drug, and as the effect of this eliminates cytostatic/cytotoxic effect of chemothraphy. Additionally due to low specific substrate recognition, one protein may confer resistance to broad spectrum of nonsimiliar chemically drugs (for example ABCB1 confers resistance to vincristine, doxorubicine, etoposide, etc). Many trails to inhibit MDR occurrence is under development – and even reach clinical trial stadium – but yet none of proposed strategies were successful (among those strategies there were trials to use small molecular inhibitors of ABC proteins, or nanocariers to deliver drugs across membranes). Those trials, at least till now, were unsuccessful mainly due to high toxiticity of inhibitors or low penetration of nanocariers.

This project is one of many in search of endogenous ways to eliminate MDR tumor cells using oncostatin M, that is known of its antitumor ability. There are few experimental data suggesting ability of this cytokine to down-regulate expression of certain ABC proteins such as ABCC2, ABCC4 and ABCG2 [3, 4]. However there are no scientific data that oncostatin M may alter/decrease expression of ABC genes/proteins in MDR cells. In this matter results obtained in this project may contribute to create prognostic tools and/or therapeutic tools, and thus reducing community and economical costs of chemoteraphy.