ImmunoTools IT-Box-139 Award 2012

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The identification and development of cancer stem cells-based predictive biomarkers for prostate cancer radiotherapy

Prostate cancer is the most frequently diagnosed cancer in men. Although conventional therapies such as surgery, hormonal therapy, radiotherapy, and chemotherapy, are effective in the initial phase of treatment, many prostate cancers eventually progress to invasive and therapy-resistant metastatic disease upon relapse. The recurrence and resistance to therapy have been attributed to the existence of stem cell-like cells referred to as cancer stem cells (CSCs). The cancer stem cell hypothesis predicts that standard prostate cancer therapy including radiotherapy can eliminate the bulk tumor cells but not CSC population, eventually leading to relapse. Resistance to radiation therapy has been reported to be a defining characteristic of CSCs from various tumor types and CSC markers were linked with poor clinical outcome. The identification of CSC associated biomarkers and molecular pathways regulating CSC properties during the course of radiotherapy is essential for optimization and individualization of cancer treatment. We are planning to discover the biomarkers of the radioresistant CSC populations using the methods of molecular and cellular biology, proteomic profiling and xenograft models.

The specific aims of this project are: **1)** characterization of the classical stem cell markers, including ALDH, CD44, CD133, CXCR4, ABCG2, OCT4, SOX2, Nanog for their potential correlation with tumor radioresistance using *in vitro* and *in vivo* radiation cell survival assays; **2**) identification of the biomarkers for radioresistant CSC populations using proteomic profiling; **3**) validation of novel cancer stem cell markers using *in vitro* radiobiological assays and animal models; **4**) characterization of the molecular pathways that the identified genes act upon; **5**) analysis of the expression of the candidate genes in clinical samples of human prostate tumors.

To discover the putative stem cell markers for their involvement in tumor radioresistance *in vitro* and in animal models, we are planning to use a panel of antibodies provided by the ImmunoTools IT-Box139.

ImmunoTools IT-Box-139 for Monica Cojoc includes 100 antibodies

FITC - conjugated anti-human CD1a, CD3, CD4, CD5, CD6, CD7, CD8, CD14, CD15, CD16, CD19, CD21, CD25, CD29, CD35, CD36, CD41a, CD42b, CD45, CD45RA, CD45RB, CD45RO, CD49d, CD53, CD57, CD61, CD63, CD80, CD86, HLA-DR, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE - conjugated anti-human CD3, CD4, CD8, CD11b, CD15, CD14, CD18, CD19, CD20, CD21, CD22, CD31, CD33, CD38, CD40, CD45, CD45RB, CD50, CD52, CD56, CD58, CD62p, CD72, CD95, CD105, CD147, CD177, CD235a, HLA-ABC, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE/Dy647 -tandem conjugated anti-human CD3, CD4, CD8, CD14, CD19, CD20, CD25, CD54

APC -conjugated anti-human CD2, CD3, CD4, CD8, CD10, CD11a, CD11c, CD14, CD16, CD27, CD37, CD42b, CD44, CD45, CD59, CD62L, CD69, CD71, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

DETAILS