ImmunoTools IT-Box-139 Award 2013

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Assessment of immunological parameters as biomarkers for the measurement of the immunotherapy effectiveness in patients with cancer

Cancer immunotherapies, in contrast to chemotherapy, do not act directly to the tumor site but exert their effect on the immune system. Therefore, immunotherapies have different kinetics compared to the chemotherapeutic agents. More specifically, they might induce a cellular immune response that predates the possible effect on tumor burden or patient survival, thus demonstrating a delayed clinical benefit in contrast to chemotherapy. Taking into consideration the unique responsive patterns of immunotherapy, it is of great interest to investigate new immunological parameters for the assessment of the immune response and the effect of immunotherapy against the tumor.(1) Moreover, the composite endpoints and biomarkers may be useful in clinical phase II studies for the prediction of efficacy in subsequent Phase III studies.(2) Based on the above, it is essential to identify new biomarkers able to predict the clinical response and the effectiveness of immunotherapy, contributing to the development of new therapeutic products and the optimization of existing immune therapies.

The current PhD project focuses on the immunotherapy of breast and prostate cancer. Patients' samples participating in a clinical trial, receiving a peptide vaccine for prevention of recurrence, will be analyzed. Previous results have shown that this vaccine can induce specific $CD4^+$ and $CD8^+$ T-cell immune responses against Her-2/neu. Apart from that, this peptide vaccine focuses on stimulating $CD4^+$ T-helper cells aiming at inducing immunologic memory and persistent stimulation of CTLs.(3)

The immune response against the specific peptide will be assessed *in vivo* and *in vitro* in different timepoints using common immunologic assays. The most important aim of this project is to investigate other immunological parameters, including several lymphocyte subpopulations, such as regulatory T cells, myeloid derived suppressor cells (MDSCs), peptide specific T-cells as well as central and effector memory T cells. ImmunoTools *IT-Box-139* will contribute to the identification and sorting of the above subpopulations by providing the surface markers (CD127, CD25, CD14, CD62L, CD11b, CD15, CD4, CD45RA, CD45RO and CD33). The results of the above parameters will be correlated retrospectively with disease free and overall survival time and therefore surrogate markers of early prediction of clinical response may occur.

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Reference List

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