T cell immunotherapy of cancer

Abstract

Cancer is the second leading cause of death worldwide. Patients diagnosed at the late stages of the disease have limited treatment options. Traditional treatment modalities such as surgery, chemotherapy and radiotherapy also have limited efficacy at the late stages of the disease. Passive cancer cellular immunotherapy, namely the adoptive cell transfer, is a promising treatment modality in patients with late and refractory forms of the disease. The objective of the presented work is the development of the T cell-based immunotherapy of prostate cancer. The work addresses 3 parts of the T cell preparation for immunotherapy: enrichment, expansion, and modulation. The first part of the study investigates new ways how to enrich the patients' lymphocytes with T cells reactive to tumor-associated antigens. The second part of the study establishes a protocol for the extensive expansion of the enriched cell cultures. The last part of the study examines new approaches for modulating the phenotype of the enriched and expanded antigen reactive T cells. The work was summarized in 3 primary-authored publications, each of which addressed the individual parts of the cell preparation for T cell-based immunotherapy.

Keywords

$CD8^+$ T cells, cytokine starvation, *ex vivo* expansion, GSK-3β-mTORC1/2 pathway, personalized T cell immunotherapy, prostate cancer, tumor-associated antigens