Dendritic cells (DCs) represent one of the most important components of the immune system. DCs are the most effective antigen presenting cells with a unique ability to stimulate naive T cells. They ensure the crosstalk between innate and adaptive immunity. They participate in anti-infectious and anti-tumor immune reaction as well as in the induction of tolerance. It is clear, that the defect in DC can be fatal for the organism.

In our work we studied the biology of DCs and the disturbances of DCs function in pathological states. We analyzed DCs in patients with Bruton‘s tyrosin kinase deficiency, we compared the effect of vitamin D analogs, calcitriol and paricalcitol, on DCs and we set up the protocol of DC generation for the immunotherapy of ovarian cancer.

In the study concerning btk deficiency and dendritic cell function we found profound impairment of IL-6 and TNF production in response to the stimulation by Toll-like receptor ligand 8.

In the second part of our work we compared the effect of calcitriol and paricalcitol on DCs. Both drugs inhibited DCs maturation and decreased their ability to induce proliferation of antigen specific T cells.

In the third part of our work we set up the protocol for the DCs, which are able to induce tumor specific immune responses. We optimized the form of tumor antigen used to pulse the DCs, defined optimal maturation stimuli. We confirm that DCs generated under these conditions are able to induce the proliferation of tumor specific lymphocytes.