SUMMARY

Viral reactivations after hematopoietic cell transplantation contribute to significant morbidity and mortality. Timely immune reconstitution of functional T cell immunity is crucial in controlling these viral reactivations. In this thesis we were able to identify several functional T cell populations, which are responsible for fast resolution of viral reactivation. Appearance of some of these populations may be even used for prediction of the occurrence of viral reactivation. On the other hand, the administration of corticoids due to the treatment of graft versus host disease contributes as significant negative predictor to viral reactivation incidence. We are also offering an option of adoptively transferred virus specific T cells for patients suffering from prolonged virus complications, through identification of suitable donors by two different methods.

Viral reactivations cause complication also in patients who underwent the solid organ transplantation. In this thesis we have found the connection between allo and virus specific T cells. We have successfully identified several cross-reactive T cell clones which have responded to both allo and viral stimulation. Further it seems that these clones may play an important role in rejection of transplanted kidney if there is also present an ongoing T cell response to viral reactivation.

It is important to study the responses of immune system through methods allowing for multiparametric measurements at a single cell level. These methods are extremely useful in studies covering the broad spectrum of immune subpopulations in reconstituting immune system after hematopoietic transplantation. To make this possible we have implemented mass cytometry together with a new cell isolation method through CD81+ immunoaffinity chromatography.

We have used gained experience in the field of T cells functional testing in complex environment of other lymphocyte subsets in the study of newly developed high affinity binders proofing their potential therapeutical effect. Functional testing of Th17 cells has shown significant immunosuppressive effect of these binders on the proliferation of Th17 cells which makes their further therapeutical usage possible.