Conclusion

Humoral and cellular immune responses developed in mice after intranasal delivery of model mouse polyomavirus derived VLPs carrying epitope of enhanced green fluorescence protein (EGFP)

- Model chimeric EGFP-VLPs were purified and used for immunization of mice. Immune response of immunized animals was examined.
- No specific antibodies against EGFP protein, but high titers of specific antibodies against major structural protein VP1 were developed in the sera of immunized animals.
- Splenocytes derived from immunized animals secreted IL-2 and IFN-γ after their antigen (EGFP or VP1) restimulation. Proliferation of $CD4^+$, but not $CD8^+$ T cells from immunized mice after the stimulation with both EGFP and VP1 was observed.
- No EGFP specific cytotoxic activity of splenocytes from immunized mice was detected.
- The presentation of EGFP-VLPs in the context ofMHC class II was blocked by inhibitors of endo-lysosomal as well as proteasomal compartments.
- Changes in the numbers of $CD25^+Foxp3^+$ subpopulation of $CD4^+$ T cells were observed in the spleens if immunized mice.

Chimeric VLPs derived from mouse polyomavirus carrying epitopes of human Bcr-Abl fusion protein (Bcr-Abl VLPs)

- Chimeric Bcr-Abl VLPs carrying 171 amino acids sequence of Bcr-Abl protein (containing Bcr-Abl breakpoint region) were prepared.
- Chimeric VLPs were used for immunization of mice and immune response studies.
- VP1-specific antibodies were developed in the sera from immunized animals; however, no anti-Bcr-Abl antibodies (IgG and IgM) were detected.
- Bcr-Abl VLPs induced activation of dendritic cells *in vitro* as shown by increased expression of CD86 and MHC II.
- Proliferation of splenocytes from immunized mice, specific to VP1, was observed, but no proliferation of cells specific to Bcr-Abl was detected.
- No cytotoxicity specific to Bcr-Abl was detected by two different assays.
- Another type of immunization strategy was tested: chimeric VLPs were loaded on dendritic cells and used for immunization. However, immunization with DCs loaded with VLPs did not result in the induction of any type of immune response specific to Bcr-Abl (antibody production, proliferation, cytotoxic activity).

Preparation of DNA vaccine expressing the epitope of Bcr-Abl fusion protein

- Plasmid for the expression of fusion protein $Bcr\text{-}Abl_{171}$-tVP3 in mammalian cells was prepared.
- The expression of the protein was verified *in vitro* by transfection of mouse fibroblasts and by detection the protein on Western blot and by immunofluorescence analysis of transfected cells.
- Mice were immunized by the plasmid DNA and their immune response was investigated. Again, administration of the vaccine did not lead to the induction of any immune responses (antibody production, proliferation, cytotoxic activity).