



Project 10-15 hp:

New tumor models for evaluation of anti-tumor immune responses in metastatic cancer

The lymph nodes are hubs for our adaptive immune response and are essential for induction of anti-tumor responses. Lymph nodes are also one of the earliest places for tumor metastasis. However, it is not understood how metastasis affects the ability to mount anti-tumor responses or if and how lymphatic metastasis influence the response to immunotherapy. The latter is important in light of the current increased use of immune checkpoint immunotherapy for cancer treatment.

In this project, you will introduce the model antigen ovalbumin OVA mammary tumor cells with the purpose of creating models where T- and B-cell responses against the tumor can be monitored under metastatic versus non-metastatic conditions. Stable gene expression will be achieved by lentiviral transduction. The cell lines will be characterized *in vitro* for gene expression on the mRNA and protein level, as well as for protein localization. Depending on the progress of the project it is also possible to perform initial *in vivo* studies.

Methodology

- Work in class 2 laboratory
- Production of plasmid
- Lentiviral production and transduction
- Cell culture of tumor lines and cell lines for viral production
- Cell proliferation assays
- mRNA expression analysis
- Immunofluorescence staining and microscopy
- Image analysis
- Graph pad statistical analysis

You will work in a dynamic environment with researchers that are experts both in vascular biology and in immunology and cancer.

You are very welcome to contact me to discuss and learn more about the project!

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References of relevance for the project:

Nawaf, M. G, Ulvmar M.H., Withers D.R. , McConnell F.M., Gaspal F.M., Jones N.D., Yagita H., Allison JP, and Lane P.J.L. Concurrent OX40 and CD30 Ligand blockade abrogates the CD4-driven autoimmunity associated with CTLA4 and PD1 blockade, while preserving excellent anti-CD8 tumor immunity. (2017) *Journal of Immunology*, Aug; 199(3):974-981. doi: 10.4049/jimmunol.1700088.

Bekhus T., Martikainen T., Olofsson A., Franzen Boger M., Vasiliu Bacovia D., Warnberg F., Ulvmar M.H.: Remodeling of the Lymph Node High Endothelial Venues Reflects Tumor Invasiveness in Breast Cancer and is Associated with Dysregulation of Perivascular Stromal Cells. (2021) *Cancers (Basel)*, 13. doi: 10.3390/cancers13020211