Adoptive transfer of tumour infiltrating lymphocytes (TIL therapy) has shown high efficacy for several human solid cancers. However, not all patients respond to TIL therapy. Good prediction tools would help to select which patients may benefit most.

The tumour microenvironment (TME) of NSCLC is infiltrated with many different immune cell types. This includes different lymphoid populations, such as T cells, B cells and NK cells. Additionally, also myeloid subsets infiltrate the tumour, such as neutrophils, macrophages, and dendritic cells. All these immune cells communicate and influence each other. We therefore hypothesized that the presence of specific immune cell types correlates with the variation of tumour reactivity in TIL products.

**Introduction**

Can we predict tumour reactivity of TIL products against NSCLC lesions based on immune infiltrates?

**Methods**

To define tumour-specific alterations of immune infiltrates, we characterized the myeloid and lymphoid cell populations present within tumour lesions and healthy adjacent tissue from 26 early-stage, and tumour lesions from 20 late-stage NSCLC patients by flow cytometry.

In a parallel line we generated TIL products according to the clinical expansion protocol and determined their tumour reactivity based on cytokine production upon co-culture with the autologous tumour digest. Polyfunctional T cells were defined as cells producing at least two cytokines. This includes different lymphoid populations, such as T cells, B cells, NK cells, NKT cells, NK cells, T cells, Macrophages, Dendritic cells, and Neutrophils.

Data were analysed using Cytobase, a/R Bioconductor package to analyse flow data in an unbiased fashion. Spearman's Rank Correlation was used to correlate immune infiltrates with expansion rate and percentage of polyfunctional T cells.

**High B cell infiltrate correlates with increased CD137 expression on expanded CD4 T cells after co-culture with the autologous tumour digest**

**Conclusions**

- Percentage of macrophages and dendritic cells positively correlates with the percentage of NK cells and neutrophils
- Percentage of neutrophils negatively correlates with the percentage of T cells and B cells
- High B cell infiltrate correlates with decreased cytokine expression of expanded CD4 and CD8 T cells after co-culture with the autologous tumour digest
- High neutrophil infiltrate correlates with increased CD137 expression on expanded CD4 T cells after co-culture with the autologous tumour digest

**What’s next?**

- Determine if the activation state of myeloid cells contributes to the correlations found with T cell functionality
- Define if T cell differentiation and exhaustion profile ex-vivo correlates with specific immune infiltrates.
- Determine if specific immune infiltrates correlates with patient characteristics.