Conclusions These studies indicate that the semi-syngeneic a-PD-1 IgG1e3 ab might be a more efficient and translatable a-PD-1 ab for preclinical in vivo studies, which is important for the future investigation of immune checkpoint inhibitor therapy.

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P02.06 ABSTRACT WITHDRAWN

P03 Tumor Microenvironment

P03.01 PREVALENCE OF CD112R⁺IMMUNE CELLS IN NORMAL LYMPHATIC TISSUES, INFLAMMATION AND THE CANCER MICROENVIRONMENT

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Background CD112R is an inhibitory immune checkpoint receptor and a putative target for novel immune therapies, but little is known about its molecular epidemiology in healthy and diseased tissues.

Materials and Methods To study the prevalence and expression level of CD112R⁺ immune cells, we analyzed more than 200 samples of normal lymphatic, inflamed and cancerous tissues in a microenvironment tissue microarray format (4 mm tissue spot diameter) and large sections using fluorescent multiplex immunohistochemistry.

Results CD112R expression was detected at variable intensity levels in 47% of CD8⁺ cytotoxic lymphocytes, 49% of CD4⁺ T helper cells, 30% of FOXP3⁺ regulatory T helper cells and in 25% of CD56⁺ natural killer cells, but no expression was seen in CD11c⁺ dendritic cells and CD68⁺ macrophages. All analyzed compartments across normal and diseased tissues showed a small subset (CD8: 9±18%, CD4: 5±15%, FOXP3: 2±5%) of immune cells with supramaximal CD112R expression. The highest fraction of cells with supramaximal CD112R expression was found in the subset of CD8⁺ cytotoxic T cells in the Peyer's patches of ileum (62%), the intergranuloma area of lymph node sarcoidosis (27%) and in ovarian cancer (37%). In cancerous tissues, the density and the fraction cytotoxic T cells with supramaximal CD112R expression was highly variable and ranged from 5% in bladder cancer to 3% in lung cancer and 36% in ovarian cancer. A high variability of the number of cells with supramaximal CD112R expression was also seen within every tumor entity.

Conclusions In summary, our analysis shows that CD112R expression is abundant in various subsets of immune cells but identifies a small fraction of cells with exceedingly high CD112R levels. The widespread occurrence of CD112R⁺

cytotoxic T cells in the cancer microenvironment may suggest considerable opportunities for checkpoint inhibitors targeting CD112R.

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P03.02 SUPPRESSION OF T-CELL PROLIFERATION AND CYTOKINE RELEASE BY THE ADENOSINE AXIS ARE MEDIATED BY DIFFERENT MECHANISMS

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Background The so-called adenosine axis has emerged as a promising therapeutic target pathway as high adenosine levels in the tumor microenvironment contribute to the suppression of antitumor immune responses. The ectonucleotidases CD39 and CD73 act in concert to degrade extracellular immunostimulating adenosine triphosphate (ATP) to immunosuppressive adenosine. According to the current model, subsequent suppression of effector immune cell function is caused by binding of adenosine to adenosine receptors like the A2a receptor (A2aR). The ectonucleotidases CD39 and CD73 as well as the A2aR have emerged as molecular targets within the adenosine axis with currently more than 20 clinical trials investigating antitumor effects of CD39-, CD73- or A2aR blockade. We aimed to perform a direct comparison of these targets with regard to their roles in regulating T-cell proliferation and IFN-γ secretion.

Materials and Methods CD39 and CD73 expression was suppressed using LNAplusTM antisense oligonucleotides (ASOs). ASOs were synthesized as gapmers with flanking locked nucleic acids (LNA) to increase stability and affinity to the target RNA, leaving a central gap for recruitment of the RNA-degrading enzyme RNaseH I. Knockdown efficacy of ASOs on mRNA and protein level was investigated in primary human T cells. Furthermore, the effects of ATP, AMP and adenosine analogues on T-cell proliferation and IFN-γ secretion were investigated. A2aR was blocked using small molecule inhibitors that are currently under clinical investigation.

Results Treatment of human T cells with LNA-modified ASOs specific for human CD39 and CD73 resulted in potent target knockdown *in vitro* without the use of a transfection reagent. T-cell proliferation was reduced after addition of ATP to activated T cells that was completely reverted by ASO-mediated suppression of CD39 and/or CD73 expression but not A2aR inhibition. Adenosine analogues inhibited IFN-γ secretion of activated T cells, however, they did not suppress T-cell proliferation. Blockade of the adenosine kinase was able to revert the anti-proliferative effect of ATP degradation products, arguing for downstream metabolites of adenosine, but not A2aR signaling, being responsible for the suppression of T-cell proliferation.

Conclusions Cytokine secretion and proliferation of T cells might be differentially regulated by the adenosine axis. Adenosine might primarily affect cytokine secretion via A2aR signaling, whereas adenosine metabolites might especially impair proliferation of activated T cells independent from A2aR