Conclusions The in vitro gene expression levels of individual chemokines (CXCL1 and CCL2) determines the MDSC infiltration in vivo into the TME. Targeting the chemokine-receptor axis of MDSC subpopulations could be a promising approach in the treatment of pancreatic cancer.

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P03.13 AGE-INDUCED CHANGES IN ANTI-TUMOR IMMUNITY ALTER THE TUMOR IMMUNE INFILTRATE AND REDUCE RESPONSE TO IMMUNE-Oncology TREATMENTS

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Background Immuno-Oncology research relies heavily on murine syngeneic tumor models. However, whilst the median age for a cancer diagnosis is 65 years or older, for practical purposes the majority of preclinical studies are conducted in young mice, despite the fact that ageing has been shown to have a significant impact on the immune response.

Materials and Methods Using aged mice bearing CT26 tumors, we analysed how aging impacts the immune composition of the tumor, spleen and tumor-draining lymph nodes by flow cytometry.

Results We found many age-related changes between aged (60–72 weeks old) and young (6–8 weeks old) mice, such as a reduction in the naïve T cell population and a decreased CD8/Treg ratio in aged animals. Profiling of co-inhibitory and co-stimulatory receptor expression levels on immune cells in aged versus young mice also identified altered expression profiles in both the periphery and tumor. We hypothesised that these differences may contribute to impaired anti-cancer immune responses in aged mice. To investigate this, we compared the anti-tumor efficacy of immune checkpoint blockade (PD-L1 and CTLA-4) and T-cell costimulation (OX-40) in aged versus young mice. Our data demonstrate that aged mice retained their capacity to generate effective anti-tumor immune responses, albeit often attenuated when compared to the responses observed in young mice.

Conclusions These differences highlight the potential importance of age-related immunological changes in assessing and refining the translational insights gained from preclinical mouse models.

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Background The preclinical evaluation of novel immune modulators for cancer treatment remains a challenge, as models require both, engraftment of human tumor cells and a compatible human immune cells. In previous experiments, we have demonstrated that we can use either peripheral blood mononuclear cells (PBMC) or hematopoietic stem cells (HSC) to establish a humanized immune system with functional T-, B-, and NK cells, monocytes, and dendritic cells. However, these models are limited by rarely matching HLA isotypes between tumor and immune cells. In this case study, we established a patient-derived xenograft (PDX) model from a patient with Head and Neck squamous cell cancer (HNSCC). After engraftment of HNSCC PDX, patients PBMC were used to humanize mice. By this procedure we successfully generated a patient-specific human tumor-immune cell model in mice with 100% HLA-matching. Model development included the comparison of PDX engraftment on mice with either HLA-matching or non-HLA-matching PBMC’s and purified T cells from different donors. Furthermore, these effects were investigated on humanized mice generated with either HLA-matching or non-HLA-matching PBMC’s and purified T cells from different donors. Blood and tumor samples were analysed by FACS and IHC for immune cell infiltration and activation.

Results In the autologous huPBMC model, no interference with the proliferation of HNSCC PDX was seen. However, on mice humanized with donor PBMC’s with a high HLA match, a strong stimulation of tumor proliferation compared to non-humanized mice was observed. On humanized mice, generated from 5 different HSC donors, HLA-matching seems to have a lower influence on engraftment. On mice humanized with PBMC from different donors, we observed a correlation of treatment effects with HLA match, with strong tumor growth inhibition in the mice with the best match. In the PDX tumors, infiltrating immune cells were detected by FACS and IHC analyses.

Conclusions We developed a humanized immune-PDX model enabling appropriate preclinical translational research on tumor immune biology and the evaluation of new therapies and combinations, as well as the identification and validation of biomarkers for immune therapy. Furthermore, results showed a correlation between immune therapy effects and HLA matching in preclinical models.

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