Research profile for applicants

Name of DKFZ research division/group:	***Immune Modulation in Cancer (D310)***
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Group homepage: *Visit this website for further information on current research and recent publications.*	***https://www.dkfz.de/en/immune-modulation-in-cancer***

RESEARCH PROFILE AND PROJECT TOPICS

My group investigates the mechanisms by which tumors evade and suppress anti-tumor immunity, with a particular focus on T-cell dysfunction and the immunosuppressive tumor microenvironment. We combine cutting-edge single-cell omics with functional studies using primary patient-derived cells, coculture systems, and mouse models to dissect immune regulation and identify actionable therapeutic vulnerabilities. Our work has revealed IL4I1 as a novel metabolic immune checkpoint in cancer (Sadik et al., *Cell* 2020) and identified an unexpected role for IL-10 in preventing T-cell exhaustion (Hanna et al., *Immunity* 2021). We have also developed preclinical models to define effective immunotherapy combinations for B-cell malignancies, including CAR-T cells and bispecific antibodies (Brinkmann et al., *Blood* 2024), and to uncover mechanisms of therapy resistance in CLL (Arseni et al., *Nature Communications* 2025). More recently, single-cell analyses of brain metastases have revealed distinct immune landscapes and therapeutic vulnerabilities (Jassowicz et al., *Cancer Cell* 2026).

A potential postdoctoral project will investigate how tumors establish and maintain an immunosuppressive microenvironment, focusing on the interplay between exhausted T cells and myeloid-derived suppressor cells (MDSCs). The project will combine single-cell and potentially spatial omics with functional studies in primary patient samples, tumor–immune cell coculture systems, and mouse models. The aim will be to identify cellular states, molecular pathways, and metabolic mechanisms that drive immune evasion and impair T-cell function, and to determine how these mechanisms contribute to resistance to immunotherapy. Building on these findings, the project will test rational therapeutic combinations designed to disrupt immunosuppressive networks and restore effective anti-tumor immunity. Ultimately, the goal is to translate mechanistic insights into novel and more effective immunotherapeutic strategies.