Research profile for applicants

Name of DKFZ research division/group:	***Tumor Ecosystem Biology (A440)***
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Group homepage: *Visit this website for further information on current research and recent publications.*	https://scholar.google.com/citations?user=0we8sUYAAAAJ&hl=it

RESEARCH PROFILE AND PROJECT TOPICS

The Tumor Ecosystem Biology group investigates a fundamental question in cancer biology: why do some early neoplastic cells successfully develop and evolve into aggressive tumors, while others are eliminated or remain contained?

Our research focuses on pancreatic ductal adenocarcinoma, a disease characterized by a particularly complex and profoundly immunosuppressive tumor microenvironment. We view this ecosystem not simply as a consequence of tumor growth, but as an active determinant of tumor initiation, evolution, immune evasion, and therapeutic response.

Our aim is to understand how interactions between tumor cells and their microenvironment are established from the earliest stages of disease and to identify mechanisms that may be exploited for cancer prevention, interception, or treatment. To address these questions, we combine lineage tracing, advanced mouse models, CRISPR-based spatial functional genomics, spatial profiling technologies, multiplex imaging, single-cell approaches, and computational analysis. Our recent work has identified spatially organized immune niches and tumor-derived regulators that promote immune evasion in pancreatic cancer (Nature, accepted; Cancer Discov. 2023 Feb 6;13(2):278-297; Nat Cancer. 2022 Mar;3(3):318-336; Nat Commun. 2023 May 8;14(1):2642).

We are seeking a postdoctoral fellow to investigate how inflammatory and environmental perturbations reshape the pancreatic tissue ecosystem and influence the earliest stages of tumor development. The project will determine how these perturbations alter immune surveillance, stromal and extracellular matrix organization, and the selection of premalignant cell states. By combining advanced mouse models with spatial profiling, multiplex imaging, and functional genomic approaches, the successful candidate will identify the cellular interactions and molecular pathways that determine whether early neoplastic cells are eliminated, remain contained, or progress toward immune-evasive disease.