

Abstract for a DKFZ project at the DKFZ

Name of DKFZ research division/group:	Division of Translational Medical Oncology (B340)
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RESEARCH PROFILE AND PROJECT TOPICS

Multidimensional tumor characterization for precision oncology

Our ambition is to improve the way we practice oncology towards a more rational and personalized approach. Our division engages in all aspects of the translational research process, including one of the most comprehensive molecular diagnostics programs in oncology worldwide (DKFZ/NCT/DTKT MASTER, <https://www.nct-heidelberg.de/master>, Horak et al. Cancer Discov 2021), clinically guided exploratory research projects, and the implementation of innovative clinical trials (e.g., ClinicalTrials.gov Identifiers NCT03110744, NCT03127215, NCT04410653, and NCT04551521). Within the MASTER program, we have analyzed more than 4,500 tumor samples by whole-exome/genome and RNA sequencing and genome-wide DNA methylation profiling and discovered previously unrecognized recurrent genetic alterations – including complex genomic, epigenomic, and transcriptomic signatures – in various tumor types. Clinician Scientists will have the unique opportunity to explore these discoveries in the laboratory, study the functional and mechanistic consequences of molecular alterations identified in human cancer patients, and, in select cases, feed the results back into the clinic, as exemplified by our recent discoveries of pharmacologically tractable NRG1 rearrangements and ERBB2 mutations in pancreatic ductal adenocarcinoma and peripheral nerve sheath tumors, respectively (Heining et al. Cancer Discov 2018, Ronellenfitsch et al. J Clin Invest 2020), and genomic imprints of defective homologous recombination DNA repair (“BRCAness”) in bone and soft-tissue sarcomas (Chudasama et al. Nat Commun 2018, Gröschel et al. Nat Commun 2019). Furthermore, we are very interested in intratumoral heterogeneity as a cause of treatment failure, and we have made it our mission to advance our understanding of this phenomenon and develop strategies to address it therapeutically as part of a new consortium established as part of the National Decade Against Cancer (<https://bit.ly/3DHS3X6>). To help realize the promise of personalized oncology based on scientific inquiry and biology-guided clinical decision-making, we seek highly motivated candidates with a passion for applied cancer research.



FROM BEDSIDE TO BENCH
AND BACK

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