Research profile for applicants

Name of DKFZ research division/group:	***Section of Translational Cancer Epigenomics, Division of Translational Medical Oncology (B340)***
Contact person:	***Priv.-Doz. Dr. Daniel Lipka, email: d.lipka@dkfz.de***
Group homepage: *Visit this website for further information on current research and recent publications.*	**www.translational-cancer-epigenomics.de/** **https://pubmed.ncbi.nlm.nih.gov/?term=lipka+db&sort=date&size=200**

RESEARCH PROFILE AND PROJECT TOPICS

In our group, we combine basic and translational research to discover and implement novel diagnostic and therapeutic approaches to malignant diseases. The main focus is on the analysis of epigenomic alterations occurring in pre-malignant and malignant cells as compared to their normal counterparts in order to understand how aberrant epigenetic programming impacts on tumor initiation and progression.

In a current project, we are developing a platform for leukemia diagnostics based on multi-omics nanopore sequencing. This work expands on our previous studies where we showed that epigenetic biomarkers allow risk stratification and prediction of treatment response in pediatric leukemia (Lipka *et al.*, Nat Comm, 2018; Schönung *et al.*, Clin Can Res, 2021; Schönung *et al*; Br J Haematol, 2025). In the proposed project, we are using nanopore sequencing with a combined genetic and epigenetic readout and subject this data to real-time bioinformatic analyses and machine learning to infer disease diagnoses, risk stratification and treatment response. The candidate will work in an international collaborative environment to generate nanopore-sequencing data of a large cohort of pediatric leukemia patients, train classification models based on state-of-the-art machine learning algorithms (supervised learning, CNNs, LLMs) and validate these models in prospective independent patient cohorts. These analyses will have an immediate impact on patient care, with the goal to be implemented into the routine diagnostic work-up of a European study group.

The successful candidate should have excellent communication skills and should demonstrate commitment toward highly interdisciplinary translational cancer research. This work will benefit from already established experimental protocols and analysis pipelines but will also involve the implementation of new state-of-the-art genomics and machine learning tools and the development of novel methods. Experience in (epi-)genomics, computational biology and/or machine learning would be ideal but are not a prerequisite..

We provide excellent working conditions in a dynamic international group of scientists together with national and international collaboration partners in the field of hematology (Clinical hematology: Prof. Müller-Tidow [Heidelberg, Germany], Prof. Erlacher [Ulm, Germany], Prof. Klusmann [Frankfurt, Germany] and bioinformatics / epigenomics: Prof. Lutsik [Leuven, Belgium]).