Research profile for applicants

Name of DKFZ research division/group:	Pediatric Leukemia (A400)
Contact person:	*Irmela.jeremias@kitz-heidelberg.de*
Group homepage: *Visit this website for further information on current research and recent publications.*	https://www.helmholtz-munich.de/en/ahs
Eligibility:	***DKFZ Postdoctoral Fellowships***

RESEARCH PROFILE AND PROJECT TOPICS

The goal of the Jeremias lab is to develop novel therapeutic strategies that induce cell death in malignant hematopoietic stem cells and thus prevent tumor relapse, with the ultimate vision to cure leukemia patients.

Our approach is to discover crucial tumor vulnerabilities required for the growth and survival of acute leukemias. By targeting cellular structures with critical function in cancer cells, we aim to develop novel individual treatment strategies and open new frontiers in precision oncology. This project focuses on the identification of such essential cancer vulnerabilities in clinically highly relevant mouse models of acute leukemia. Our patient-derived xenograft (PDX) mouse model offers a patient-centered approach with direct clinical translatability. To functionally characterize genomic changes to identify targets for individualized therapy, we employ genetic engineering: by lentiviral transduction of PDX cells, we can express artificial transgenes in these cells, but also re-express or switch off tumor-relevant genes. Thus, the effect of a genomic modification on leukemia stem cell survival and on tumor growth can be investigated in vivo. This approach is unique worldwide, as only a few laboratories are able to genetically modify PDX cells. In this project, you will employ cutting-edge genetic tools, including CRISPR screening systems in the in vivo setting. Genetically altered cells will be characterized using next generation sequencing at bulk and single cell level, and bioinformatic analyses.
Our overarching goal is to discover therapies capable of eliminating LSC, overcoming therapy resistance and preventing relapse to improve the prognosis of acute leukemia patients.

The outstanding work of the Jeremias group is also supported by various national and international funding organizations. Prof. Jeremias previously received two ERC grants and most recently has been awarded the prestigious Reinhart Koselleck funding by the DFG.

The Jeremias lab is well connected in the Heidelberg research community and actively extending its cooperations offering unique chances for collaborations. Among others, we are part of the University Hospital Heidelberg and the Hopp Children's Cancer Center (KiTZ). Furthermore, we are closely collaborating with research groups at the EMBL Heidelberg and several proposals for contribution to collaborative research centers are in preparation.