

Research profile for applicants

Name of DKFZ research division/group:	Hematology and Immune Engineering (A014)
Contact person:	Dr. Mirco J. Friedrich Group Leader mirco.friedrich@dkfz.de
Group homepage: <i>Visit this website for further information on current research and recent publications.</i>	https://www.dkfz.de/en/hematology-and-immune-engineering

RESEARCH PROFILE AND PROJECT TOPICS

Our group investigates how the immune system can be synthetically reprogrammed to detect, control, and ultimately prevent hematological malignancies such as multiple myeloma and leukemia. We integrate concepts from synthetic biology, immuno-oncology, and gene editing to engineer both immune cells and their surrounding environment. A central theme of our work is the development of individualized immune interventions, from next-generation CAR-T cells and bispecifics to *in vivo* immune system rewiring, that overcome immune aging, exhaustion, and tumor evasion. Using patient-derived samples, cutting-edge molecular tools, and functional immune profiling, we seek to uncover and manipulate the circuits that govern immune surveillance in blood cancers.

A prospective postdoctoral project will explore how synthetic immunology can be harnessed to restore immune surveillance in multiple myeloma. The project combines adoptive T cell engineering with *in vivo* delivery of immunomodulatory factors to overcome the immune evasion typical of the bone marrow microenvironment. The aim is to develop a modular strategy that enhances the persistence, specificity, and function of T cells in aged or immunosuppressed hosts - without the need for myeloablative conditioning. This includes designing new constructs, optimizing delivery platforms (e.g., lipid nanoparticles), and testing immune reconstitution and anti-tumor efficacy in preclinical models. The project will provide opportunities for deep mechanistic work and rapid translational application in the context of early-phase immunotherapy trials. Candidates with expertise in T cell biology, molecular engineering, or translational immunology are especially encouraged to apply.



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