

Research profile for applicants

Name of DKFZ research division/group:	Cell Fate Engineering and Disease Modeling (A340)
Contact person:	Moritz Mall Tel: +49 6221 42-3195 E-Mail: m.mall@dkfz.de
Group homepage: <i>Visit this website for further information on current research and recent publications.</i>	https://www.dkfz.de/en/cell-fate-engineering-and-disease-modeling

RESEARCH PROFILE AND PROJECT TOPICS

Transcriptional and chromatin control of cell identity in development and cancer

Cell identity is established by lineage-defining transcription factors that act on a permissive chromatin landscape and is actively maintained against competing transcriptional programs. This stability is not passive. Repressive circuits, chromatin state, and network topology continuously constrain the accessible fate space of a differentiated cell. Where these constraints fail, cells acquire aberrant plasticity, a process central to dedifferentiation, stem cell like states, lineage switching, and therapy resistance in cancer.

Our group defines the molecular logic of this control. We use direct reprogramming and cell fate engineering in human pluripotent stem cells to build defined cell types from the ground up, then apply large scale gain and loss of function screens to identify the factors required for fate induction versus fate maintenance. We resolve the underlying mechanisms with single cell multiomics, chromatin accessibility and occupancy profiling, and network inference, and we validate candidate regulators in organoid and mouse models of human disease.

We seek postdoctoral fellows to pursue projects including:

- Dissecting the genetic and epigenetic determinants of cell fate induction and maintenance, integrating reprogramming systems with perturbation screens and computational modeling of regulatory networks.
- Defining how loss of transcriptional repression and chromatin constraint enables plasticity in human malignancies, using patient-derived models and lineage-resolved single cell analysis.
- Identifying regulatory nodes whose perturbation restabilizes or redirects tumor cell identity, as a route to transcription factor-directed therapeutic strategies.



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Candidate profile:

- PhD in molecular or cell biology, stem cell biology, genomics, computational biology, or a related discipline.
- Demonstrated productivity, evidenced by first-author publications or preprints.
- Interest in working across experimental and computational approaches, with willingness to develop expertise in the complementary domain.
- Independence, rigor, and a collaborative approach to science.



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