

## Research profile for applicants

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| Name of DKFZ research division/group:                                                                             | <b><i>Cancer Progression and Metastasis Group (A013)</i></b>                                                                           |
| Contact person:                                                                                                   | <b><i>Rene Jackstadt</i></b><br><a href="mailto:r.jackstadt@dkfz.de"><i>r.jackstadt@dkfz.de</i></a><br><b><i>06221423917</i></b>       |
| Group homepage:<br><i>Visit this website for further information on current research and recent publications.</i> | <a href="https://www.dkfz.de/en/cancer-progression-and-metastasis"><i>https://www.dkfz.de/en/cancer-progression-and-metastasis</i></a> |

### RESEARCH PROFILE AND PROJECT TOPICS

#### Targeting high plasticity cell states in metastasis and resistance

Metastatic colorectal cancer (mCRC) remains largely incurable because tumor cells dynamically adapt during disease progression and therapy. The Cancer Progression and Metastasis Group investigates the biological mechanisms that drive metastatic evolution, therapeutic resistance, and tumor cell plasticity. Our long-term goal is to identify transient vulnerabilities during metastatic progression and translate these discoveries into novel therapeutic strategies for patients.

Our interdisciplinary research integrates genetically engineered mouse models (GEMMs), patient-derived organoids (PDOs), CRISPR-based functional genomics, single-cell and spatial multi-omics, computational biology, machine learning, and advanced imaging to study metastatic progression across multiple biological scales. By combining mechanistic cancer biology with prospective patient cohorts and investigator-initiated clinical trials, we bridge fundamental discoveries with translational and clinical cancer research.

Recent work from our laboratory identified TROP2-positive oncofetal cells as metastasis-initiating, therapy-resistant cancer stem cells and demonstrated that these cells represent a therapeutically targetable vulnerability in mCRC (Nature, 2026). In parallel, we discovered a previously unrecognized High Plasticity Cell State (HiPlaCells) that appears to function as a central intermediate during dynamic tumor cell-state transitions. This project may aim to define the molecular mechanisms regulating this plasticity state, determine how it controls metastatic progression and therapeutic resistance, and evaluate whether it represents a novel therapeutic vulnerability. We further established unique longitudinal patient cohorts comprising matched primary tumors, multiple metastatic lesions, and patient-derived organoids linked to treatment response, providing an exceptional resource to investigate metastatic evolution in patients.



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Potential postdoctoral projects will combine experimental and computational approaches to investigate tumor cell plasticity and metastatic evolution. Depending on the candidate's interests, projects may involve single-cell and spatial multi-omics, organoid engineering, functional genomics, mouse models, computational biology, or translational studies linked to biomarker discovery and investigator-initiated clinical trials.

We seek highly motivated postdoctoral researchers with backgrounds in cancer biology, stem cell biology, computational biology, bioengineering or related disciplines who are excited to combine fundamental mechanistic research with translational oncology in a highly collaborative and international research environment.



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