Research profile for applicants

Name of DKFZ research division/group:	***Epithelium Microbiome Interactions (D300)***
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Group homepage: *Visit this website for further information on current research and recent publications.*	***https://www.dkfz.de/en/Epithel-Mikrobiom-Interaktionen/index.php***

RESEARCH PROFILE AND PROJECT TOPICS

In the EMIL group, we study how bacteria contribute to cancer development, metastasis and treatment response. Our team includes cancer researchers, tissue engineers, microbiologists, and bioinformaticians working together to help patients by deciphering the functional impacts of bacteria in human tumors.
Using tissue samples from patients, we isolate bacterial strains and create organoids. These models can be combined with additional features of the human gut on USB stick-sized devices, “organ chips”, for detailed studies. In different projects, we also transplant organoid-bacteria mixtures into mouse models to study their migration and interaction in a whole body context.

In our unique biobank at DKFZ, we characterize both tumor organoids and tumor-resident bacterial strains through whole genome sequencing, fluorescence microscopy, and other cutting edge methods. Based on the diverse data obtained, we develop hypotheses about how specific bacterial species might influence tumors. With our broad portfolio of patient-derived models, our main focus lies on, on testing these relationships. Through close collaborations with clinical partners, we work towards the rapid translation of our findings towards new microbiome-based detection, prevention and treatment strategies of cancer.

A postdoc project in our group is meant to allow you to follow your own scientific interests in collaboration with the team and boost your scientific profile. Therefore, your project will emerge from the intersection of your experiences, future plans, and what our lab environment can enable you to do. However, most projects in our group can be summarized in 2 categories:

1. Functional studies on bacterial strains in colorectal cancer development and progression. These include organoid and organ chip culturing, bacterial culturing, genetic engineering with CRISPR Cas9, co-culture development, immune cell co-cultures and mouse model transplantations.

2. Integrative bioinformatics of host and microbiome in patients.
In this type of project, you can do up to 80% dry lab work, coupled to generating your own datasets and validating the patterns you discover together with group members and external collaborators. Our focus is on host transcriptomics (single cell and bulk), bacterial strain whole genome sequencing and microbiome-targeted sequencing of patient tissues.

If you like working in a young team with flat hierarchies, a collaborative spirit and a keen interest in functional cancer microenvironment work, get in touch!