Dr. med. Marie-Elisabeth Leßmann & Dr. rer. nat. Shady Sayed

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Junior Clinician Scientist
nTTP-GCT-Cohort 2025

Medical Clinic and Polyclinic I
Thoracic Oncology Group
UNIVERSITY HOSPITAL CARL GUSTAV
CARUS DRESDEN

Fields of Research:

- Lung Organoids
- Precision Oncology
- Tumorimmunology

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Translational Scientist
nTTP-GCT-Cohort 2025

Medical Systems Biology,
Frank Buchholz AG
UNIVERSITY HOSPITAL CARL GUSTAV
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Fields of Research:

- Genome Engineering
- Cancer Biology
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Pioneering Molecular Surgery with CRISPR Technologies for Personalized Lung Cancer Therapy

Project Description:

Lung cancer remains one of the greatest global health challenges due to its high mortality rate and the complexity of its genetic landscape. Advances in understanding specific mutations have enabled targeted therapies that improve treatment outcomes, however, the development of resistance is nearly inevitable. This project investigates the interaction between known driver mutations, mutations of unknown clinical significance, and resistance mechanisms within patient-derived lung tumor organoids using CRISPR-Cas9 technologies. The aim is to leverage these insights to guide the development of mutation-specific CRISPR-Cas9 therapeutics.

In the first year, existing organoid cultures with different mutations will be treated using various CRISPR technologies to examine the functional relevance of these mutations and analyze their impact on cancer cell growth. In the second phase, strategies for targeted gene transfer and validation will be developed for future *in vivo* applications.

The project is planned for at least two years but is intended to continue beyond the funding period. The goal is to establish CRISPR technology as a valuable addition to existing therapeutic approaches and to develop new therapeutic options for lung cancer.

GCT
National Strategy
Gene- and Cell-Based Therapies
Promotion of Translational Talents

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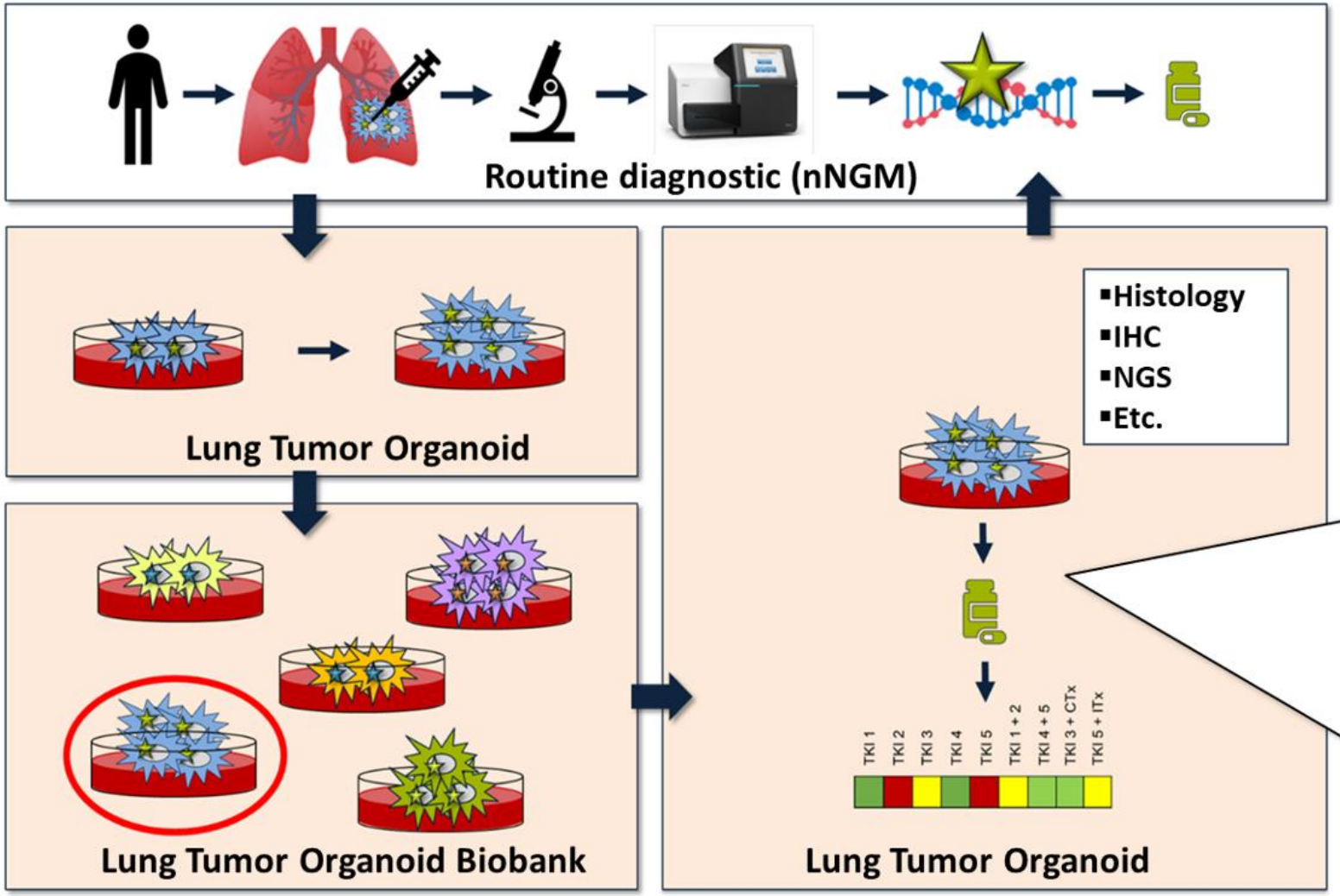
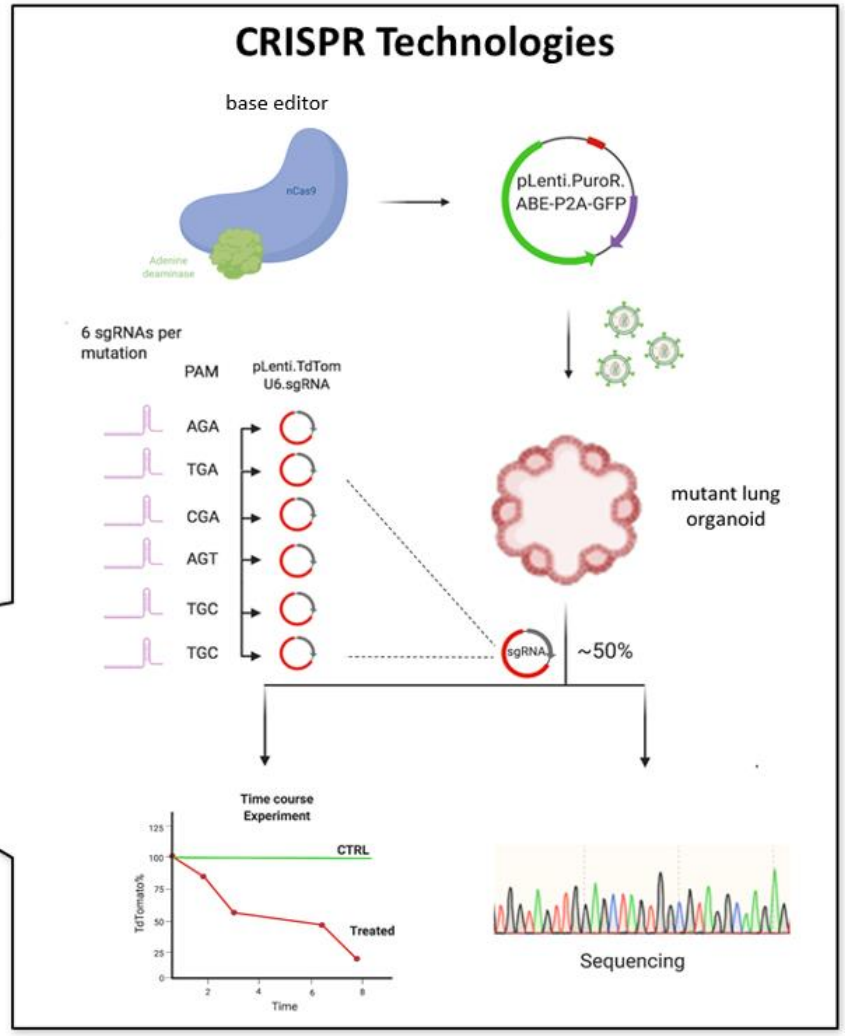
Pioneering Molecular Surgery with CRISPR Technologies for Personalized Lung Cancer Therapy





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