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Junior Clinician Scientist
nTTP-GCT-Cohort 2025

Clinic for Gynecology and Obstetrics
HANNOVER MEDICAL SCHOOL

Fields of Research:

- Translational Gynecologic Oncology
- CAR NK-based Cell Therapy in Gynecologic Oncology
- Live-Cell Imaging Cytotoxicity Assays
- Large Language Models in Multidisciplinary Gynecological Tumor Boards
- Artificial Intelligence in Gynecologic Oncology

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Translational Scientist
nTTP-GCT-Cohort 2025

Institute for Experimental Hematology
HANNOVER MEDICAL SCHOOL

Fields of Research:

- Advanced Immunotherapies for Solid Tumors
- CAR NK Cells
- 3D Tumor Models
- Organoids
- Transcriptome Analysis of TME

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Harnessing primary gynecological cancer samples to identify new tumor antigens for next-generation cell therapies

Project Description:

Ovarian and cervical cancers remain among the most lethal gynecological malignancies, with limited treatment options and high recurrence rates. This project aims to develop advanced cell therapies by identifying tumor-specific antigens and engineering chimeric antigen receptor (CAR)-NK cells to selectively target cancer cells.

Patient-derived tumor samples will be collected and biobanked at MHH, providing a crucial resource for characterizing tumor antigen expression. Using single-cell RNA sequencing, flow cytometry, and immunohistochemistry, the tumor microenvironment will be analyzed to identify novel antigens suitable for CAR-based targeting. Identified antigens such as Mesothelin, B7-H3, and CA125 will be used to generate CAR-NK cells, leveraging an established alpharetroviral platform to ensure efficient and stable gene transfer. In addition, all clinically available disease-related patient data will be collected for comparison to the experimental readouts.

To validate therapeutic efficacy, engineered CAR-NK cells will be tested in both 2D and 3D tumor models. Functional assays, including cytotoxicity and live-cell imaging, will assess the specificity and potency of these cells against ovarian and cervical cancer samples. The project follows a structured timeline, with continuous patient sample collection, target antigen identification, CAR-NK cell development, and functional testing as the main steps.

With patient samples already enrolled in the biobank, the feasibility of obtaining sufficient tumor material is ensured. Standardized protocols (SOPs) have been implemented to guarantee experimental reproducibility. CAR-NK therapies present a promising alternative to CAR-T cells, potentially offering fewer side effects while maintaining potent anti-tumor activity. If successful, this work will establish a foundation for first-in-human clinical trials (Phase I/IIa), contributing to the future of personalized immunotherapies in gynecological oncology.

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

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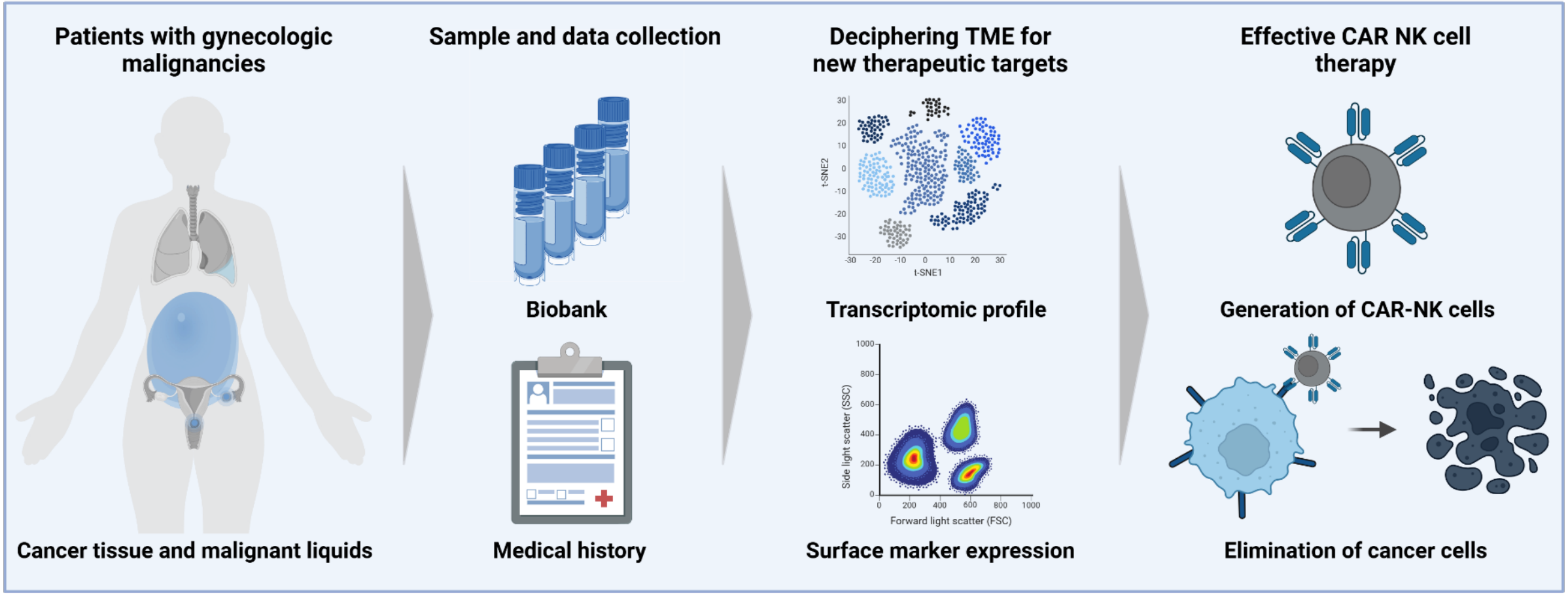

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