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Junior Clinician Scientist
Elected Fellow Representative
nTTP-GCT-Cohort 2025

Department of Cardiovascular Surgery
UNIVERSITY MEDICAL CENTER,
JOHANNES-GUTENBERG UNIVERSITY,
MAINZ, GERMANY

Fields of Research:

- Translational Medicine
- Cardiac Regeneration
- Tissue Engineering
- Cell Therapy
- Perioperative Immunomodulation

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Translational Scientist
nTTP-GCT-Cohort 2025

TRON gGmbH MAINZ

Fields of Research:

- Stem Cells
- Tissue Engineering
- Cardiac Regeneration
- Cell Therapy

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Project Description:

The objective of our research project, NapaCaRe, is to advance the clinical implementation of innovative mRNA-based therapies for the treatment of ischemic heart disease and heart failure. Within this initiative, we aim to develop a nanoparticle/mRNA therapy designed to promote cardiac regeneration following myocardial injury—an area where no approved therapeutic options currently exist.

The adult mammalian heart possesses no intrinsic regenerative capacity. However, recent studies have identified specific proteins capable of inducing cardiomyocyte proliferation. To date, these findings are based solely on animal models, with no direct translational application to humans. Our project seeks to bridge this gap by using these proliferation-inducing proteins in the form of a nanoparticle-formulated mRNA.

We will investigate this approach using human cardiomyocytes, either derived from heart biopsies or differentiated from human stem cells. This represents a directly translational strategy aimed at counteracting cardiomyocyte loss by stimulating the proliferation of existing cardiomyocytes in order to mitigate heart failure.

