

Changing the game: Next-generation DNAzymes for antiviral therapies

Initiative: Innovative Ansätze in der antiviralen Wirkstoffentwicklung

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The inherent capabilities of specific DNA sequences, so-called DNAzymes, to selectively eliminate unwanted RNA molecules pose an outstanding antiviral potential. However, reduced cellular activity frequently limits DNAzyme therapeutic applications. This proposal aims to overcome the persisting limitations by developing novel DNAzyme variants with strongly increased antiviral efficacy. To achieve this goal, the interdisciplinary project team will exploit their recently obtained new mechanistic understanding of the system and address the DNAzyme's persisting antiviral limitations via *in silico* predictions, *in vitro* characterizations, *in cellulo* monitoring, and innovative chemical synthesis in an integrative approach. While the DNAzyme technique is, in general, able to target a broad range of viruses, the lymphocytic choriomeningitis virus (LCMV) and vesicular stomatitis virus (VSV) systems have been selected as initial test systems to validate the approach via reliable viral readout parameters in tissue culture and preclinical experiments. Following these proof-of-principle experiments, DNAzymes for human viral pathogens will be generated and tested in tissue culture settings.

Projektbeteiligte

Dr. Manuel Etzkorn

Universität Düsseldorf
Mathematisch-Naturwissenschaftliche Fakultät
Institut für Physikalische Biologie
Düsseldorf

Prof. Dr. Philipp Lang

Universitätsklinikum Düsseldorf
Institut für Molekulare Medizin II
Düsseldorf

Prof. Dr. Holger Gohlke

Universität Düsseldorf
Mathematisch-Naturwissenschaftliche Fakultät
Institut für Pharmazeutische und Medizinische
Chemie
Düsseldorf

Prof. Dr. Stephanie Kath-Schorr

Universität Köln

Department für Chemie

Institut für Organische Chemie

Köln