

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.

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