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Decoding NAD-RNAs in Bacteriophage Infection

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Bacteriophage infection is shaped by small metabolites and dinucleotides, which can act as crucial regulatory molecules in virus–host interactions. One prominent example is nicotinamide adenine dinucleotide (NAD+), a central redox cofactor that also serves as an RNA cap. In this project, we investigate how NAD-capped RNAs influence bacteriophage infection using the T4–Escherichia coli system as a model. We identify the first NAD-capped RNAs in this infection context and show that RNA modifications can modulate phage–host processes, including RNAylation, a recently discovered reaction in which the T4 ADP-ribosyltransferase ModB transfers NAD-capped RNAs to proteins. Together, our results indicate that NAD-RNAs represent an additional regulatory layer in bacteriophage infection and suggest that similar RNA modification-dependent mechanisms may operate in other bacteria–phage systems.

Reference #1

Wolfram-Schauerte M, Keuthen H, Moskalchuk A, Ueffing T, Pozhydaieva N, Ramírez Rojas AA, Schindler D, Ka

Reference #2

Wolfram-Schauerte M, Pozhydaieva N, Grawenhoff J, Welp LM, Silbern I, Wulf A, Billau FA, Glatter T, Urlaub

Reference #3

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