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Poster #20: RNAylation as a Potential Modulator of Translation in bacteriophage T4 Infection of Escherichia coli

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RNAylation is a novel discovered post-translational modification catalyzed by the bacteriophage T4 ADP-ribosyltransferase ModB in which NAD-capped RNAs are covalently attached to host ribosomal proteins. These ribosomal proteins play central roles in translation initiation and elongation. While RNAylation has been shown to occur during bacteriophage T4 infection, its impact on the translational process remains largely unknown. Infections in Escherichia coli with bacteriophage T4 carrying a catalytically inactive ModB mutant result in delayed lysis, reduced burst size, and decreased phage adsorption (1). This suggests that ModB could play a crucial role in hijacking the translational apparatus of *E. coli*. Building on these observations, this study investigates how RNAylation mediated by ModB during phage infection affects translation in *E. coli*.

To further explain the biological role of ModB, we aim to characterize its protein structure to gain mechanistic insight into its catalytic activity and substrate recognition.

Understanding how this modification affects translation will provide insight into phagehost interactions and will unravel novel strategies bacteriophage T4 use to manipulate *E. coli*.

Reference #1

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

Höfer K. A viral ADP-ribosyltransferase attaches RNA chains to host proteins. Nature. 2023 Aug;620(7976):1054-1062. doi:
10.1038/s41586-023-06429-2. Epub 2023 Aug 16. PMID: 37587340; PMCID: PMC10468400.

Reference #2

Reference #3

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