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Zorya-mediated defence results in distinct cellular outcomes following phage infection

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The Zorya defence system is a multi-protein antiviral complex that detects phage infection at the bacterial membrane and restricts viral replication. Although the three Zorya subtypes share homologous membrane-spanning components, they encode distinct cytoplasmic effector proteins, suggesting mechanistic divergence between subtypes.

Here, we investigate the anti-phage defence profile of Zorya using plaque assay, live-cell time-lapse microscopy and fluorescence imaging coupled with automated image analysis. We observe distinct infection phenotypes following phage infection, with the outcome of Zorya-mediated defence varying according to the infecting phage.

Using reporter strains, that enable to track the fate of the injected phage DNA and host DNA, we investigate the roles of Zorya subtype-specific effector proteins in mediating anti-phage defence.

Our findings reveal both shared and distinct features of Zorya-mediated immunity and indicate that the conserved membrane-associated machinery is coupled to subtype-specific effector activities that determine the outcome of antiviral defence.

Reference #1

Reference #2

Reference #3

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