
A novel RmuC domain-containing protein mediates phage defence in *Pseudomonas* spp.

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Résumé

Competitive bacteria-bacteriophage interaction has resulted in the evolution of numerous bacterial defence systems that prevent phage propagation, with phage co-evolving counter-resistant strategies, resulting in a stable equilibrium in the natural environment.

In recent years, computational and bioinformatic studies have allowed tremendous advances in discovering novel bacterial defence systems, rendering increasingly clear that many more systems still await discovery. These systems are encoded within defence islands, genomic loci where many distinct defence systems are clustered together.

Here we report the identification of a novel antiphage system that is part of *Pseudomonas* defence arsenal. We identify six subtypes of the novel system, which share a core component that harbours a RmuC domain. Through phenotypic and biochemical characterisation of its components, we demonstrate that this system provides protection against a panel of different phages and that the RmuC domain is crucial for defence. The novel systems were renamed ShieldI-VI, and their RmuC-harboured core component was renamed ShdA. We show that ShdA can degrade phage DNA *in vitro* and alter the normal nucleoid organisation of chromosomal DNA. Collectively, our data identify a new player within *Pseudomonas* bacterial immunity arsenal that displays a novel mode of action.

Mots-Clés: Bacterial immunity, DNase, Phage defence

*Intervenant