

INHIBITION OF CRISPR-CAS DEFENCE BY ANTI-CRISPR PROTEINS

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Bacteriophages and bacteria are in a constant evolutionary arms race, developing a variety of attack, defence and counter-defence tactics. In the face of phage attacks, bacteria have evolved multiple defensive mechanisms, one of which is the CRISPR-Cas system. This system encodes a ribonucleoprotein complex that destroys the invading phages by targeting their genetic material.¹ To evade this defence strategy, phages employ anti-CRISPR (Acr) proteins that disrupt the functionality of the CRISPR-Cas system, typically by interfering with its DNA-binding or hydrolytic functions.² CRISPR-Cas systems are used as invaluable tools for genome editing.³ The ability of Acr proteins to modify the actions of CRISPR-Cas opens up new possibilities for their biotechnological applications.⁴ More than 100 Acr families have been identified, but the molecular mechanisms are only understood for a limited number of these proteins.⁴

In this study, we aim to elucidate the inhibition mechanisms of the type I-F CRISPR-Cas system by small AcrIF proteins. By combining *in vivo*, structural and biochemical methods, we analyse the molecular interplay between the components of the system and the AcrIF proteins.

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