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Balancing the evolution advantages and drawbacks of CRISPR.
PU HAN[1], MICHAEL DEEM[2], Rice University — CRISPR/Cas (Cluster Regularly Interspaced Short Palindromic Repeats/CRISPR associated proteins) is an adaptive immune system of prokaryotes. It can protect bacteria against invading genetic material. Besides providing immunity against lytic phages, the CRISRP/Cas system can block the acquisition of beneficial mobile genes, such as plasmids carrying antibody resistant genes. We discuss how bacteria balance the advantages and the drawbacks of CRISPR in an environment that has both lytic phages and beneficial mobile genes. We show that in the absence of lytic phages, bacteria lose CRISPR/Cas rapidly to acquire the beneficial mobile genes. We also discuss how CRISPR/Cas establishes in the bacterial population in the presence of both lytic phages and beneficial mobile genes.

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