

CRISPR-Cas systems provide prokaryotes with adaptive immunity against invaders such as phages and plasmids. CRISPR-Cas systems target invaders using information stored in CRISPRs (clustered regularly interspaced short palindromic repeats): loci that contain alternating units of an identical repeat (repeats) and short invader-derived sequences (spacers). CRISPR transcripts are processed to a battery of CRISPR RNAs (crRNAs) that each contains a unique invader guide sequence (and common repeat sequence). The crRNAs associate with Cas proteins to form effector complexes that recognize and degrade invading nucleic acids to effect immunity. Diverse CRISPR-Cas systems are prevalent in bacteria and archaea, and are categorized into multiple compositionally distinct groups. To acquire the ability to recognize and destroy invaders, CRISPR-Cas systems capture fragments of foreign DNA within the host CRISPR locus. We recently have identified DNA and protein elements essential for this process in a Type II-A CRISPR-Cas system in *Streptococcus thermophilus*.