

GENETIC ENGINEERING TECHNOLOGIES AND DETECTION OF GENE EDITING

The Swiss Army Knife Of Genome Engineering: A Brief History, Mechanistic Overview, And Current Applications Of Crispr Technology

Tiffany Bernardo MilliporeSigma **Simone Oppenheimer** MilliporeSigma **Casey Jowdy** MilliporeSigma **Mohammad Hossain** MilliporeSigma
Matthew Mandeville MilliporeSigma **Gurpreet Balrey** MilliporeSigma

The application of CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats), the ancient adaptive immune system, discovered in archaea and most bacteria, has accelerated genome engineering efforts both at the bench and in the clinic. Here, we outline the history and discuss the mechanism of CRISPR-based editing and modulation. We will also explore the translation of these applications from basic research to clinical outcomes. Finally, based on these data, we will provide a foundation for discussing ethical implications, dual-use concerns for the warfighter, and unintended impacts.