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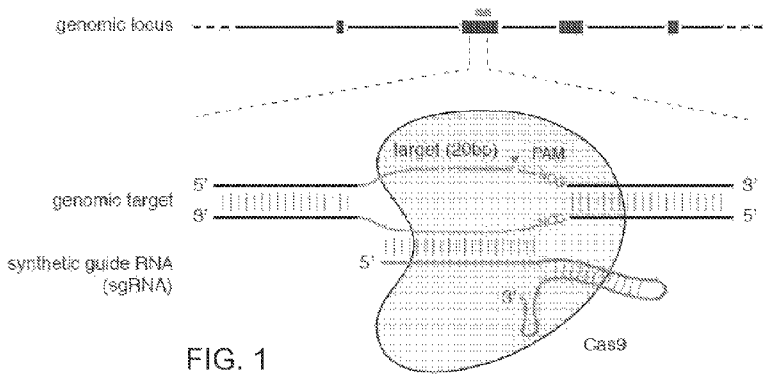


FIG. 1

(57) Abstract: The invention provides for engineering and optimization of systems, methods, and compositions for manipulation of sequences and/or activities of target sequences. Provided are compositions and methods related to components of a CRISPR complex particularly comprising a Cas ortholog enzyme.

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