System-level perturbations of cell metabolism using CRISPR/Cas9

CRISPR/Cas9 (clustered regularly interspaced palindromic repeats and the associated protein Cas9) techniques have made genome engineering and transcriptional reprogramming studies more advanced and cost-effective. For metabolic engineering purposes, the CRISPR-based tools have been applied to single and multiplex pathway modifications and transcriptional regulations. The effectiveness of these tools allows researchers to implement genome-wide perturbations, test model-guided genome editing strategies, and perform transcriptional reprogramming perturbations in a more advanced manner than previously possible. In this mini-review we highlight recent studies adopting CRISPR/Cas9 for systems-level perturbations and model-guided metabolic engineering.

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