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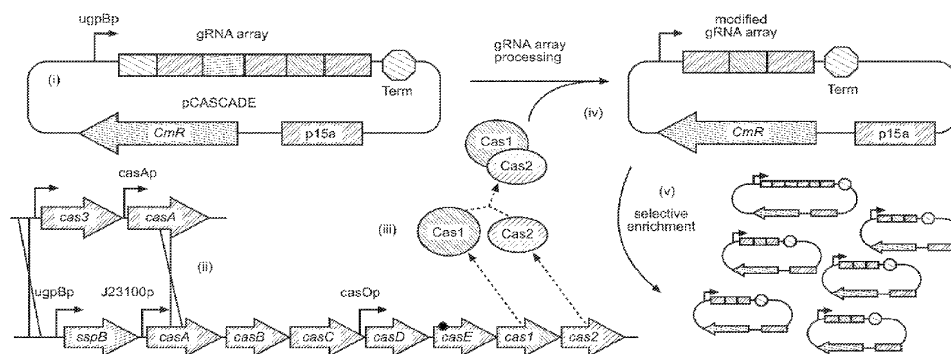


FIG. 1A

(57) Abstract: CRISPR based interference has become common in various application form genetic circuits to dynamic metabolic control. In *E. coli*, the native CRISPR Cascade system can be utilized for silencing by deletion of the *cas3* nuclease along with expression of guide RNA arrays, where multiple genes can be silenced from a single transcript.