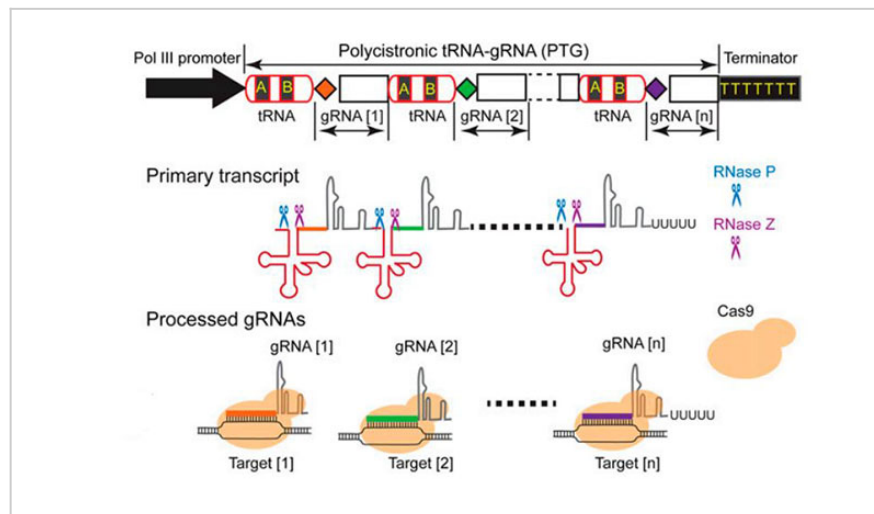


RNA-Guided Multiplex Genome Editing via the tRNA Processing System

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PennState



tRNA System for Multiplex Genome Editing

Technology Summary

The technology provides a method for efficient production of numerous gRNAs in vivo from a synthetic polycistronic gene via an endogenous RNA processing system. The technology represents an improved method that facilitates robust genome editing at multiple loci. Methods could be used to improve many RNA-based multiplex technologies, including but not limited to CRISPR/Cas9-mediated genome editing and modifications, epigenome editing, RNA targeting, transcriptional modulation, and artificial microRNA mediated gene silencing. The disclosed methods may additionally be used to insert exogenous DNA sequences into a predetermined location and target DNA sequences for knock-out or mutation via deletion. Disclosed methods and compositions have a broad range application for small RNA expression and genome engineering, additionally including cell culture and animal models.

Application & Market Utility

Highly precise and efficient cleavage for equal molar production of multiple gRNAs from a single transcript

No obligation to start with a specific nucleotide for U3 or U6 promoters

tRNA acts as an internal promoter to significantly increase gRNA expression (~10 fold increase over U3 promoter)

Option to use a Pol II promoter and single transcriptional unit for efficient expression of gRNA/Cas in a spatial/temporal manner

Small insert size to facilitate viral delivery

Broad Application in Plants (exclusive licensee has sublicensing right) animals and microbes

Next Steps

Seeking research collaboration and licensing opportunities.

TECHNOLOGY READINESS LEVEL

1-3

Seeking

Investment | Licensing | Research

Keywords

- tRNA and polycistronic RNA
- genome editing/CRISPR
- Highly cited PNAS article
- Transcriptional program
- U.S. Patent No. 10,308,947

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