HIGH-THROUGHPUT EXPRESSION-LINKED PROMOTER SELECTION (ELIPS) IN MAMMALIAN CELLS

Tech ID: 32361 / UC Case 2021-151-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20240209392	06/27/2024	2021-151

BRIEF DESCRIPTION

The ability to precisely control gene expression is fundamental to advancing biotechnology and medicine, yet designing functional synthetic promoters for eukaryotic cells remains a complex challenge. UC Berkeley researchers have developed a high-throughput platform for the generation and selection of synthetic transcriptional promoters. This technology utilizes expansive libraries of recombinant expression vectors to identify promoter sequences with optimized performance characteristics. By linking promoter sequence to measurable expression outputs, the method allows for the rapid discovery of highly functional, custom-tuned regulatory elements that are compatible with a variety of eukaryotic host systems.

SUGGESTED USES

»
Precision Gene Therapy: Engineering cell-type-specific promoters to ensure therapeutic genes are only active in target tissues, reducing off-target effects.

»
Industrial Bioproduction: Optimizing the yield of recombinant proteins or secondary metabolites in yeast or mammalian cell factories by using high-strength synthetic promoters.

»
Synthetic Biology Circuits: Creating complex biological logic gates that require precisely balanced expression levels of multiple genetic components.

»
Agricultural Biotechnology: Developing crop traits with inducible or developmental-stage-specific expression patterns to improve stress tolerance or yield.

»
Drug Discovery Screening: Utilizing reporter-linked synthetic promoters to build high-sensitivity assays for identifying small molecules that modulate specific signaling pathways.

ADVANTAGES

»
High-Throughput Efficiency: Enables the simultaneous screening of thousands of promoter variants, drastically accelerating the timeline for regulatory element discovery.

»
Customizable Expression Profiles: Provides a platform to "dial-in" specific expression strengths, from weak basal levels to extremely high-output activity.

»
Eukaryotic Compatibility: Specifically optimized for the complex transcriptional machinery of eukaryotic cells, overcoming the limitations of bacterial-derived systems.

»
Scalable Library Generation: Employs robust methods for generating diverse vector libraries, ensuring a broad sequence space is explored during selection.

»
Functional Validation: Directly links the promoter sequence to its functional performance in vivo, ensuring that selected leads are immediately ready for application.

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INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

» **Biotechnology**
» Genomics
» Health
» Industrial/ Energy
» **Research Tools**
» Expression System
» Screening Assays
» Vectors

RELATED CASES

2021-151-0

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Compositions And Methods For Production Of Recombinant Adeno-Associated Virus
- Membrane-Associated Accessory Protein Variants Confer Increased AAV Production
- Human Central Nervous System (CNS) Targeting AAV Variants
- Improving Packaging and Diversity of AAV Libraries with Machine Learning

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