Engineered RNA Polymerase

Tech ID: 34739 / UC Case 2025-786-0

BRIEF DESCRIPTION

A breakthrough in synthetic biology: an evolved DNA polymerase that synthesizes natural and modified RNA, paving the way for advancements in epigenetics, vaccine development, and drug discovery.

FULL DESCRIPTION

Utilizing directed evolution, researchers at UC Irvine developed C28, a newly engineered polymerase with robust RNA synthesis capabilities. This innovative polymerase can synthesize RNA at a rate of 3 nucleotides per second with over 99% fidelity, handle long-range RNA synthesis and reverse transcription, and perform chimeric DNA-RNA amplification. Its ability to accept a wide array of RNA analogs, including those resistant to natural polymerases, positions C28 as a pivotal tool in biotechnology and medicine, offering new avenues for research and therapeutic development.

SUGGESTED USES

- Development of mRNA vaccines with reduced immunogenicity.
- Drug discovery and development through novel RNA synthesis pathways.
- Advancements in epigenetic research via modified RNA synthesis.
- Synthesis of DNA directly on RNA templates, opening new biotechnological research tools.

ADVANTAGES

- Unprecedented RNA synthesis rate of 3 nucleotide per second with high fidelity.
- Capability to synthesize long-range RNA, reverse transcripts, and chimeric DNA-RNA sequences.
- Accepts a broad range of RNA analogs, surpassing natural polymerases.
- Produces less immunogenic byproducts, enhancing its application in vaccine development.
- Derived from a unique homologous recombination library, offering novel enzyme composition.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

CATEGORIZED AS

- **Biotechnology**
  - Other
- **Medical**
  - Research Tools
  - Vaccines
- **Research Tools**
  - Nucleic Acids/DNA/RNA
  - Protein Synthesis
  - Screening Assays
- **Engineering**
  - Other

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