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METHODS OF PRODUCING RIBOSOMAL RIBONUCLEIC ACID COMPLEXES FOR DIRECT RNA SEQUENCING

Tech ID: 33189 / UC Case 2017-258-0

BACKGROUND

Long read nanopore sequencing can directly sequence RNA molecules, including rRNA, and result in full-length RNA sequences. rRNA sequencing is particularly useful for identifying microbes and full-length rRNA sequencing can identify microbes with post transcriptional modifications that confer antibiotic resistance. Such post transcriptional modifications are invisible to amplification based sequencing or other sequencing techniques that require reverse transcription.

Before this technology was developed, there were few if any efficient methods for preparing rRNA libraries for direct RNA sequencing, particularly for microbial identification in either a clinical or an environmental setting.

TECHNOLOGY DESCRIPTION

The methods involve hybridizing a probe complement oligonucleotide with an oligonucleotide probe. The oligonucleotide probe has one region that features a degenerate sequence complementary to the 3' region of rRNA and another region complementary to the probe complement oligonucleotide. A sequencing adapter is ligated to the probe complement oligonucleotide and the oligonucleotide probe. These form a complex that can then be directly sequenced in a long-read sequencer such as a nanopore sequencer. The patent includes claims to probes, libraries of complexes, other compositions, and kits.

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OTHER INFORMATION

KEYWORDS

ribosome, nanopore, phylogeny, taxonomy, oligonucleotide, RNA, sequencing

CATEGORIZED AS

- ▶ **Biotechnology**

▶ Genomics

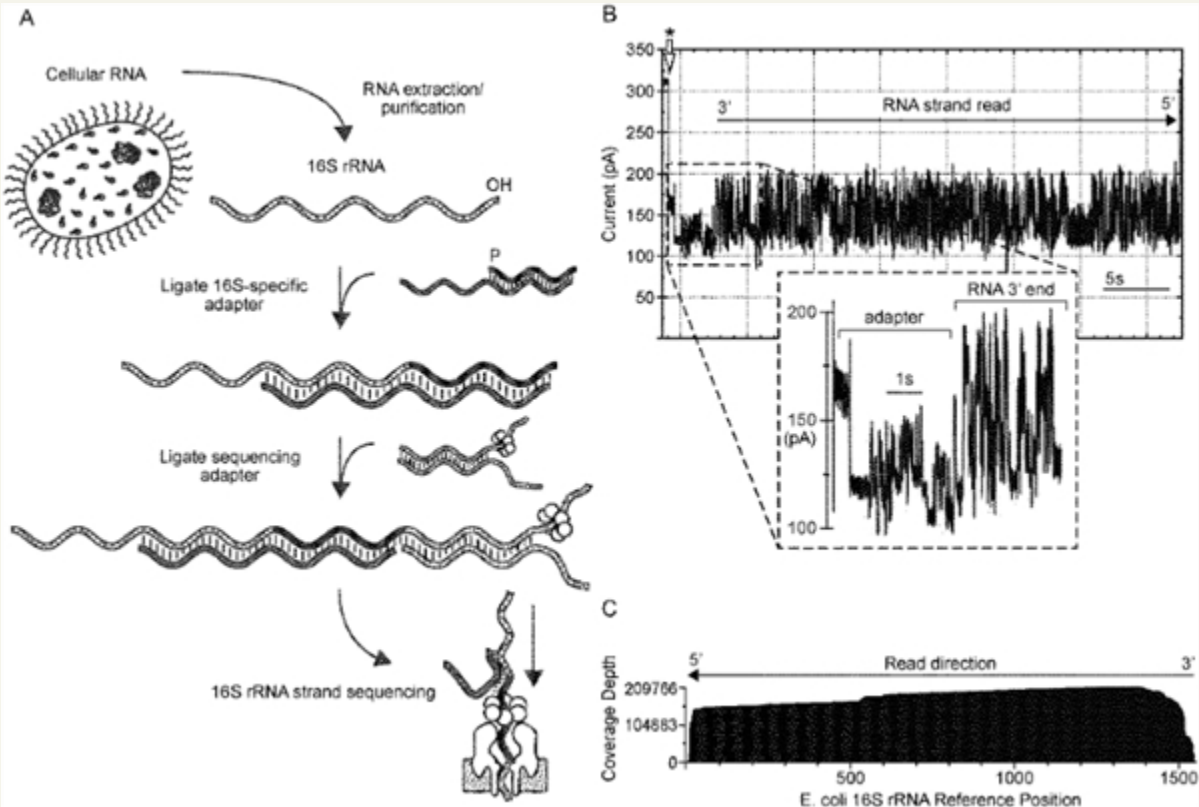
▶ Health
- ▶ **Medical**

▶ Disease: Infectious Diseases
- ▶ **Research Tools**

▶ Nucleic Acids/DNA/RNA

RELATED CASES

2017-258-0



APPLICATIONS

- ▶ Direct rRNA sequencing in long read sequencing reactions.
- ▶ rRNA library preparations

- ▶ Identification of microbes in complex systems (clinic or environmental)
- ▶ e.g. 16S rRNA sequencing

ADVANTAGES

- ▶ Issued patent with broad actionable claims
- ▶ Efficient and simple system

INTELLECTUAL PROPERTY INFORMATION

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,578,362	02/14/2023	2017-258
United States Of America	Published Application	20230295714	09/21/2023	2017-258

RELATED MATERIALS

- ▶ [Reading canonical and modified nucleobases in 16S ribosomal RNA using nanopore native RNA sequencing - 05/16/2019](#)