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## TMI-seq: Tn5 Transposase Mediated Production of Complex Libraries for Short Read Sequencing

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### INVENTORS

- ▶ Cole, Charles
- ▶ Vollmers, Christopher

### OTHER INFORMATION

#### KEYWORDS

Illumina (R) sequencing, Short Read Sequencing, Transposase, Tn5, TMI-Seq, Antibody sequencing, Immune Repertoire Sequencing, cDNA libraries

#### CATEGORIZED AS

- ▶ **Biotechnology**
  - ▶ Bioinformatics
- ▶ **Research Tools**
  - ▶ Nucleic Acids/DNA/RNA

#### RELATED CASES

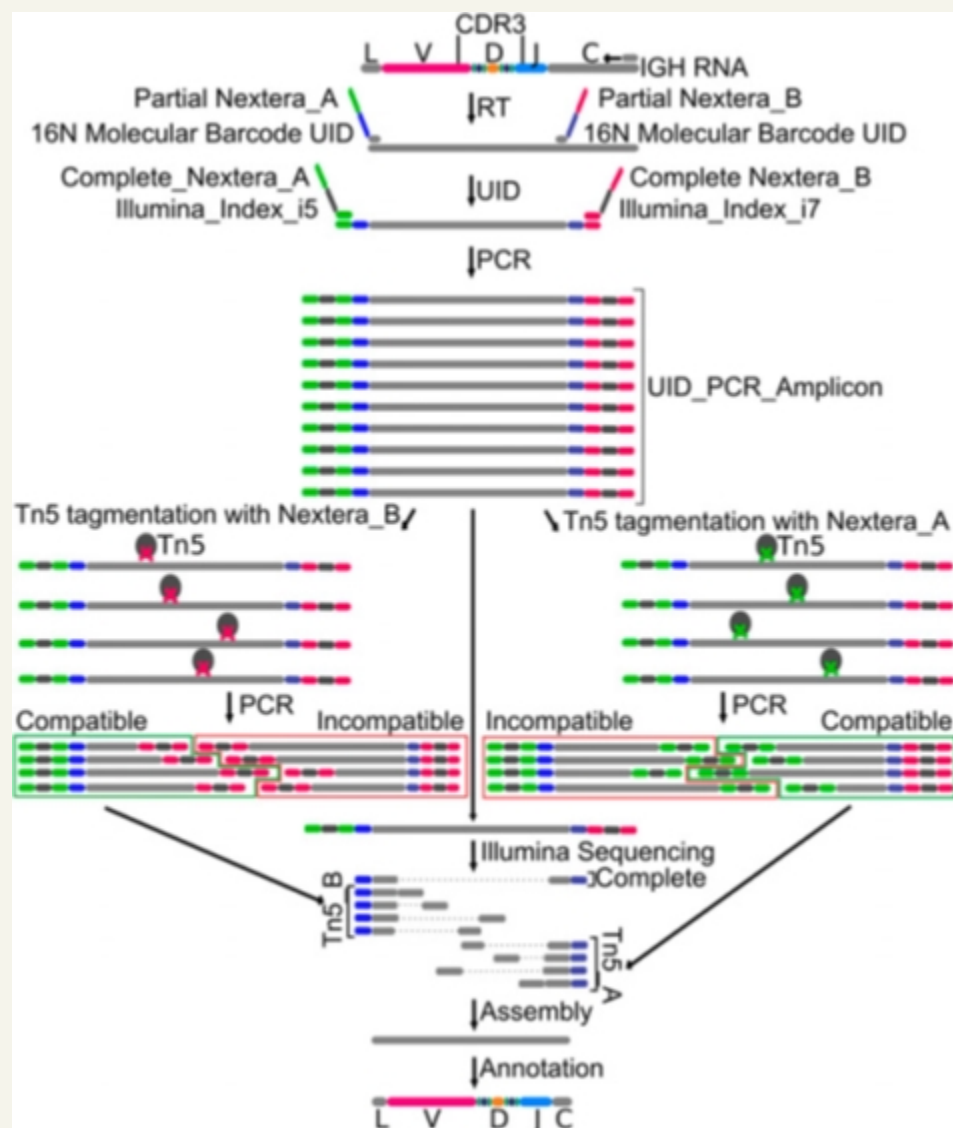
2015-974-0

## BACKGROUND

Although Next Generation Sequencing has vastly improved sequencing throughput while reducing sequencing costs, preparation of nucleic acid libraries for sequencing has become a bottleneck. In addition, it is difficult using short read next generation sequencing to assemble highly variable sequences that exceed 500 base pairs such as cDNAs derived from antibody heavy chain, antibody light chain, and T cell variable regions RNA.

## TECHNOLOGY DESCRIPTION

The technology, termed “TMI-seq” is a library preparation that combines molecular barcoding of individual molecules with “tagmentation” – a process by which the Tn5 transposase both fragments and adds tags to DNA. In one use of the method, RNA is reverse transcribed to integrate a molecular barcode and a partial forward and reverse sequencing primer. It is then amplified by PCR, which integrates index sequences and full forward and reverse sequencing primers to yield a full length cDNA library. One aliquot of the library is tagmented with Tn5 and the forward sequencing primer, resulting in a library of barcoded overlapping fragments focused on the 5’ region of the target sequence. A second aliquot is tagmented with Tn5 and the reverse sequencing primer, resulting in a library of barcoded overlapping fragments focused on the 3’ region of the target sequence.



## APPLICATIONS

- ▶ RNA → cDNA library sequencing
- ▶ Sequencing of T Cell receptors and antibodies

## ADVANTAGES

- ▶ Fast prep and accurate assembly for short read sequencers like Illumina sequencers.
- ▶ High quality data from immune repertoire sequences
- ▶ Accurate TCR and antibody repertoire sequences

## INTELLECTUAL PROPERTY INFORMATION

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	<a href="#">11,319,576</a>	05/03/2022	2015-974
United States Of America	Issued Patent	<a href="#">10,280,449</a>	05/07/2019	2015-974

## RELATED MATERIALS

- ▶ [Cole et al, Highly Accurate Sequencing of Full-Length Immune Repertoire Amplicons using Tn5-Enabled and Molecular Identifier-Guided Amplicon Assembly, J Immunol 2016; 196:2902-2907 - 02/01/2016](#)

## ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Simple And Gentle Method To Extract 10Kb Dna From Agarose Gels](#)

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