

# ChimeraLM: A genomic language model to detect chimer artifacts

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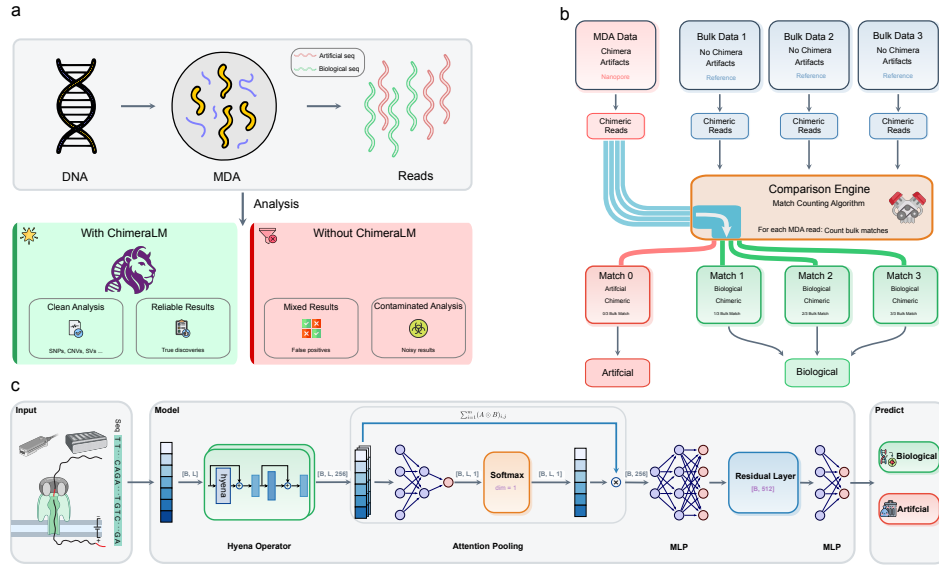
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## Abstract

**Non-colinear Transcript (NLT)** arising from structural variations challenge conventional linear analysis approaches in transcriptomics. Here we introduce the concept of **Transcriptome Segment Graph (TSG)** and present the first comprehensive infrastructure for graph-based transcript analysis. We develop the TSG file format as the first standardized encoding for transcript segment graphs, enabling systematic representation of **NLT**, and complex splicing patterns impossible to capture with linear methods. Our command-line toolkit provides the first comprehensive suite for **TSG** manipulation, analysis, and format conversion, while Aurora offers the first interactive visualization platform for transcript segment graphs. Together with our companion TSG caller scannls, this work establishes the foundational infrastructure for a new paradigm in transcriptomic analysis, providing the essential tools for systematic investigation of **NLT** structures.

**Keywords:** Transcriptomics, Graph-based analysis, Non-colinear transcripts, TSG caller, TSG visualization



**Fig. 1** Problem and Model

## 1 main

Transcriptomic structural variations, including gene fusions, circular RNAs, and complex alternative splicing, play critical roles in cancer, development, and disease.

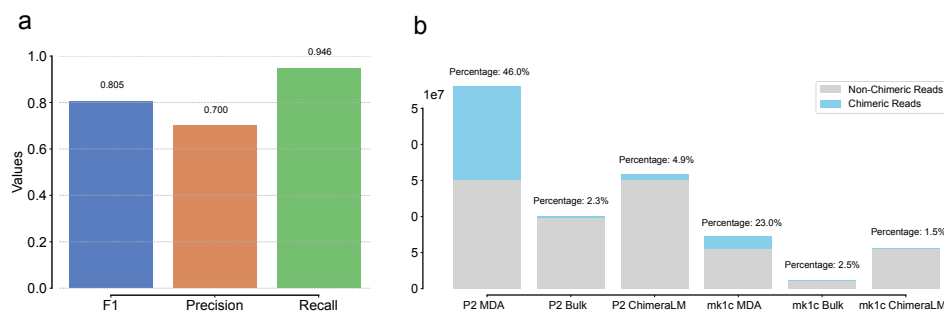
## 2 Methods

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**Supplementary information.** This separation aligns with how many transcript assembly algorithms work:

1. First, chains of exons and splice junctions are identified from the data
2. Then, potential transcripts are derived by traversing the graph in different ways



**Fig. 2** Problem and Model

3. Finally, relationships between different transcript graphs are established

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## Acronyms

**NLT** Non-colinear Transcript [1](#)

**TSG** Transcriptome Segment Graph [1](#)

## Appendix A Section title of first appendix

An appendix contains supplementary information that is not an essential part of the text itself but which may be helpful in providing a more comprehensive understanding of the research problem or it is information that is too cumbersome to be included in the body of the paper.

## References