ChimeraLM: Background & Motivation

Chimera Artifacts

Artificial chimeric reads

× Challenge

Downstream Analysis

Structural Variation Detection

False Discoveries

Artificial SV events

Incorrect results

ChimeraLM AI

AI-powered Chimera Detection

Distinguish artificial from chimera

Problem: Chimera artifacts contaminate real biological signals, leading to false SV calls

Multiple Displacement Amplification (MDA)

Nanopore Sequencing

MDA

MDA Process Issues:
- Non-uniform amplification creates artifacts
- Template switching during amplification
- Chimeric reads appear biologically real
- Standard tools cannot distinguish them

ChimeraLM Solution:
- Deep learning-based classification
- Trained on MDA vs Bulk comparison
- High accuracy artifact detection
- Improves downstream SV analysis

Long Reads

Nanopore sequencing

✓ Advantage