ChimeraLM: Background & Motivation

Multiple Displacement Amplification (MDA)
MDA

Nanopore Sequencing

High Coverage
Amplifies limited DNA

✓ Advantage

Chimera Artifacts
Artificial chimeric reads

✗ Challenge

Long
Nano seque

✓ Adv

Downstream Analysis
Structural Variation Detection

False Discoveries
Artificial SV events

Incorrect results

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

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

ChimeraL
AI

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

Distinguish artificial

from biological

chimeric reads