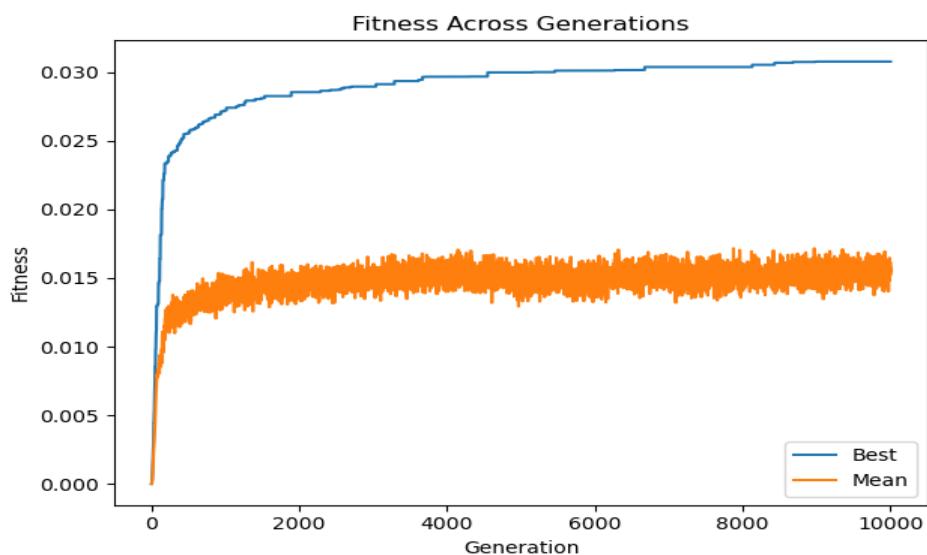


# Codon Optimization Report

## 1. Genetic Algorithm Optimization Summary

Total generations: 9999  
Best composite fitness achieved: 0.030773

## Fitness Progression

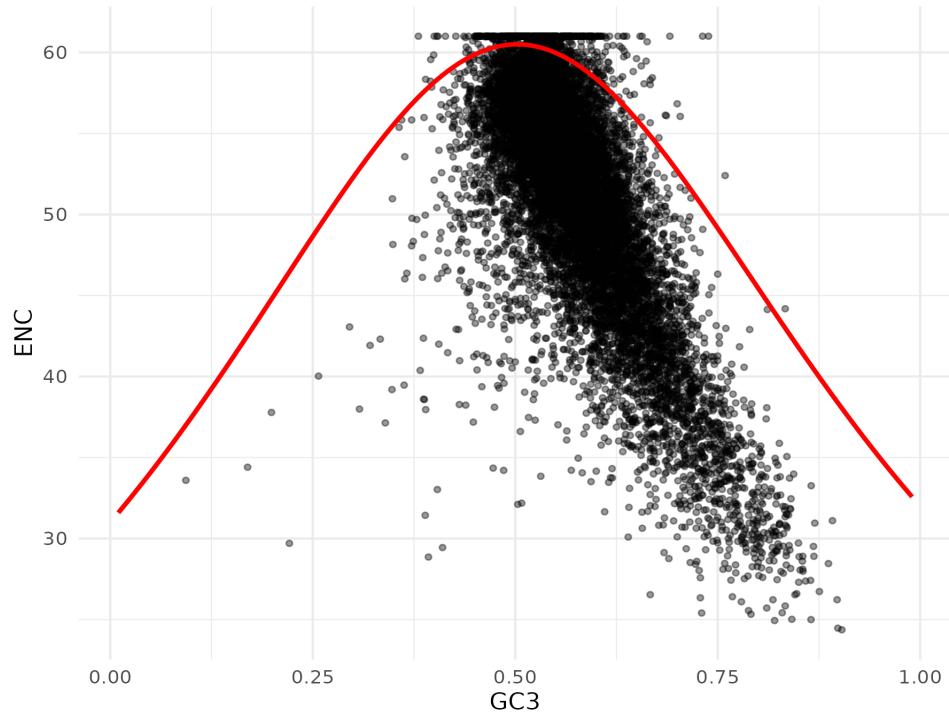


## 2. Final Optimized Sequence Metrics

Sequence length: 1215 nt  
GC content: 0.5259  
GC3 content: 0.5654

## 3. Genome Codon Bias (Wright Plot)

Wright Plot (ENC vs GC3)



#### 4. Interpretation Notes

- Optimization balances translational efficiency and genome-wide codon conformity.
- GC content is constrained using a Gaussian penalty centered on genome average.
- Cryptic splice-site penalties were applied during genetic algorithm optimization.
- Final sequence should be validated experimentally before synthesis.