Gene Expression Prediction

Sequence to Expression Pipeline

Genomic DNA:

TF1

TF2

Enhancer	Promoter	Gene Body
TF binding sites	TSS region	Exons + Introns

Deep Learning Model (Enformer)

Convolutional Layers (local patterns)

Transformer Layers (long-range interactions)

Predicted Expression Levels

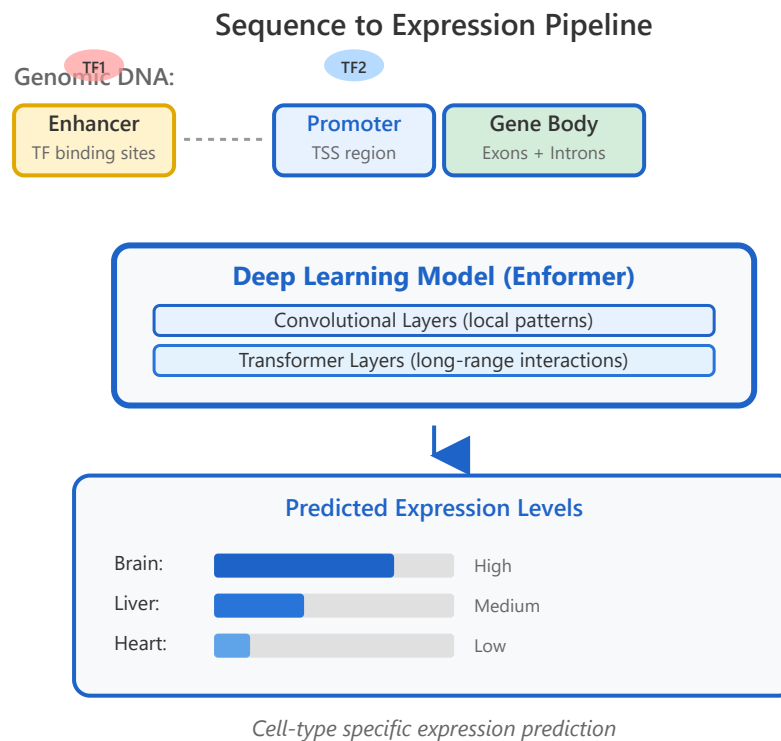Brain: High

Liver: Medium

Heart: Low

Cell-type specific expression prediction

Sequence to expression
DNA → RNA abundance mapping

Promoter models
TSS region activity prediction

Enhancer grammar
TF binding syntax learning

Cell type specificity
Context-dependent prediction

Enformer architecture
Transformer + CNN hybrid model