

Transcription Process

Initiation

- RNA polymerase binds promoter
- TATA box recognition
- Transcription factors assist
- DNA unwinds at start site

Elongation

- RNA synthesized 5' → 3'
- Template strand read 3' → 5'
- Ribonucleotides added
- Transcription bubble moves

Termination

- Rho-dependent or independent
- Hairpin structure formation
- RNA polymerase dissociates
- Pre-mRNA released

RNA Processing

- 5' cap (7-methylguanosine)
- 3' poly(A) tail
- Splicing removes introns
- Mature mRNA produced