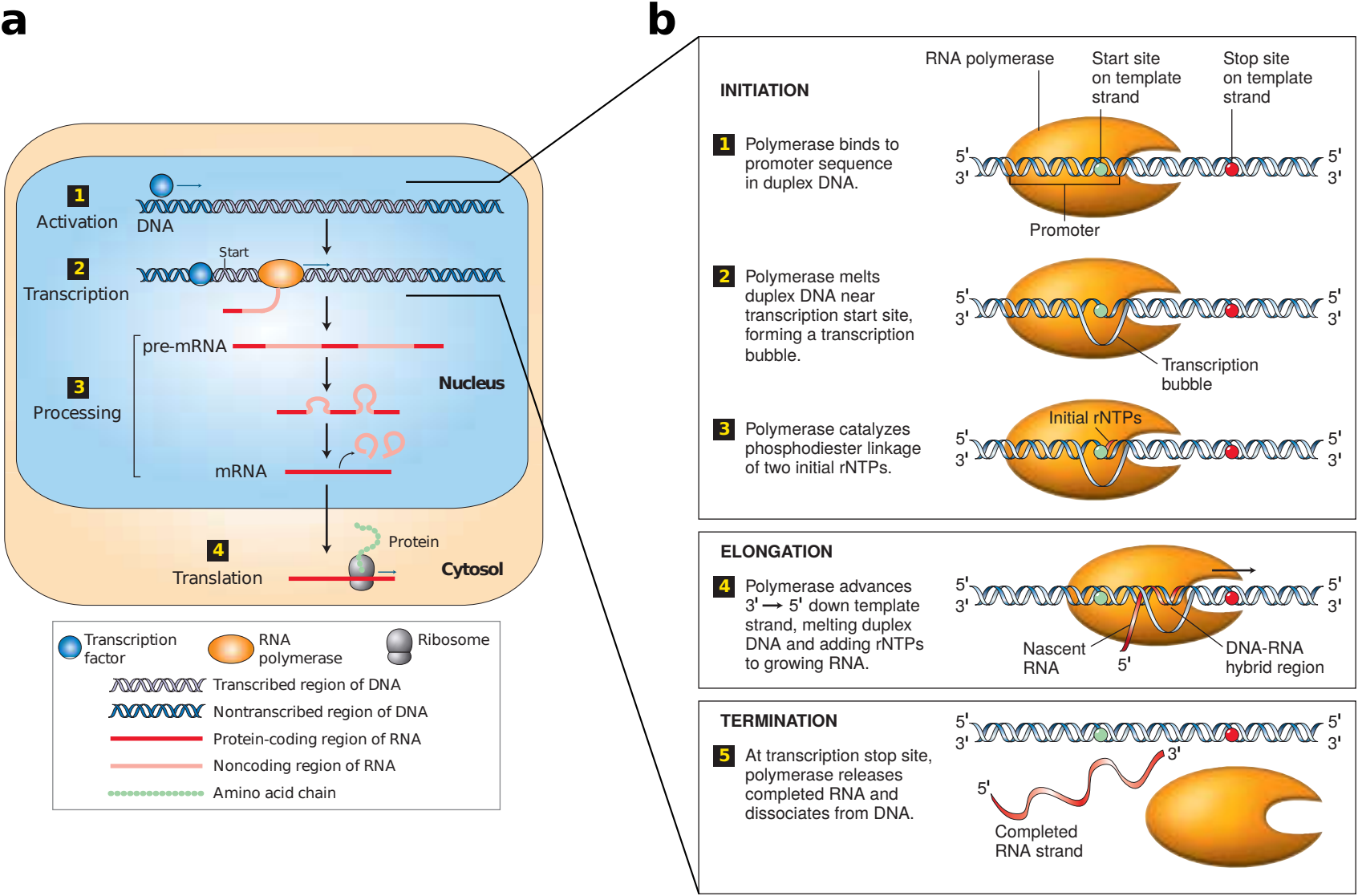
a
1
Activation
DNA
2
Transcription
Start
pre-mRNA
3
Processing
Nucleus
mRNA
4
Translation
Protein
Cytosol
Transcription factor
RNA polymerase
Ribosome
Transcribed region of DNA
Nontranscribed region of DNA
Protein-coding region of RNA
Noncoding region of RNA
Amino acid chain
b
INITIATION
RNA polymerase
Start site on template strand
Stop site on template strand
1 Polymerase binds to promoter sequence in duplex DNA.
5'
3'
Promoter
2 Polymerase melts duplex DNA near transcription start site, forming a transcription bubble.
Transcription bubble
3 Polymerase catalyzes phosphodiester linkage of two initial rNTPs.
Initial rNTPs
ELONGATION
4 Polymerase advances 3' → 5' down template strand, melting duplex DNA and adding rNTPs to growing RNA.
Nascent RNA
DNA-RNA hybrid region
TERMINATION
5 At transcription stop site, polymerase releases completed RNA and dissociates from DNA.
Completed RNA strand