

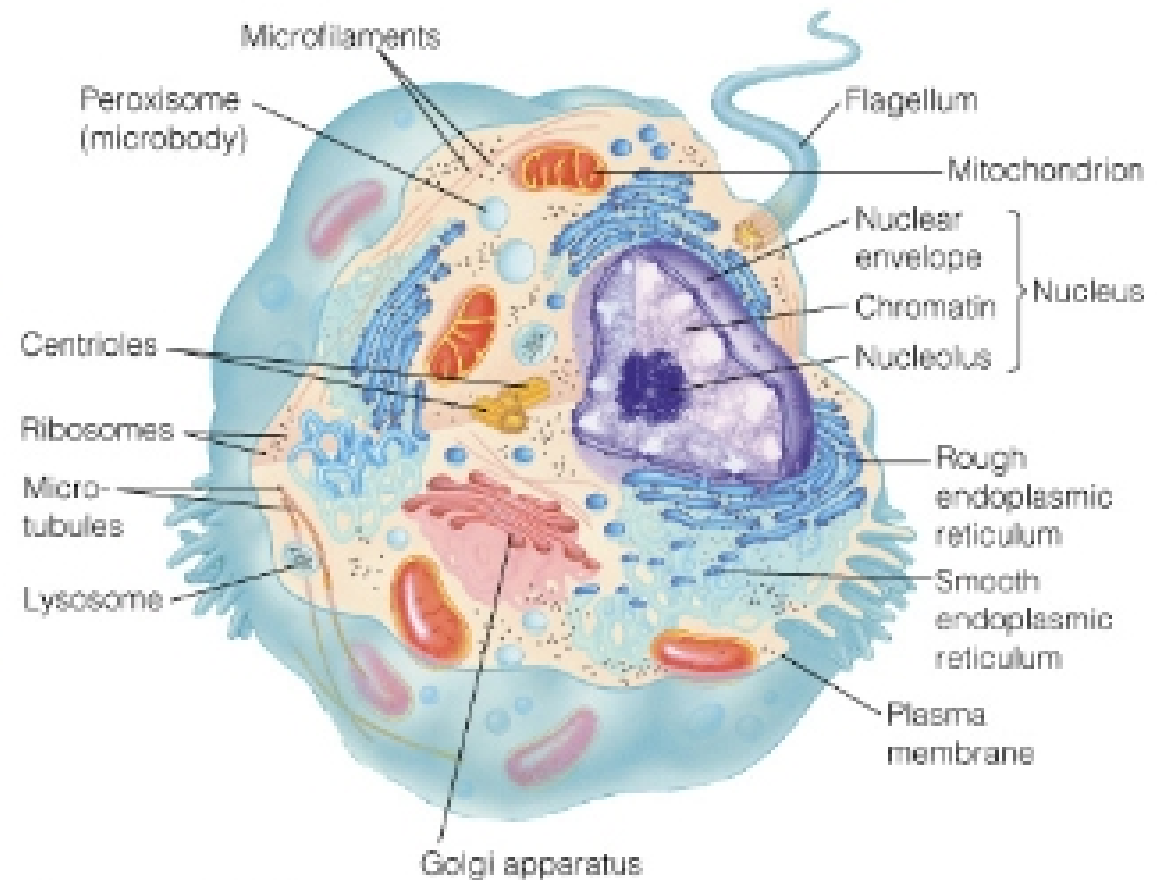
RNA synthesis/Transcription II
Biochemistry 302

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Repertoire of eukaryotic RNAPs

- **Pol I (13 subunits, ~600 kDa)**
 - Nucleolar enzyme
 - Synthesis of pre-rRNA (45S RNA transcript → 18S, 5.8S, 23 S rRNAs, mammals)
- **Pol II (12 subunits, ~500 kDa)**
 - Nuclear enzyme
 - Synthesis of pre-mRNA and some snRNAs
 - Very sensitive to α -amanitin
- **Pol III (14 subunits, ~700 kDa)**
 - Synthesis of pre-tRNA
 - Synthesis of 5S rRNA and remaining snRNAs
- **Mitochondrial RNAP**
- **Chloroplast RNAP**



(a) Typical animal cell

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Fig. 1.11

Features of promoter & regulatory regions of genes transcribed by RNAPs

- **RNAP I**

- Transcribes multiple, tandemly arranged copies of gene encoding 45S pre-rRNA
- Core promoter and proximal upstream elements that vary greatly from species to species
- Distal upstream elements

- **RNAP II**

- Transcribes mainly protein-coding genes but some snRNA genes as well
- Conserved TATA box and Inr elements (general factors)
- Gene-specific upstream elements & enhancers (regulatory factor binding sites)

- **RNAP III**

- Transcribes 5S rRNA and tRNAs, some snRNAs and miRNAs
- Highly conserved core promoter elements with some located within the gene itself (A, B, and C boxes, 5S rRNA)