8.4 Transcription

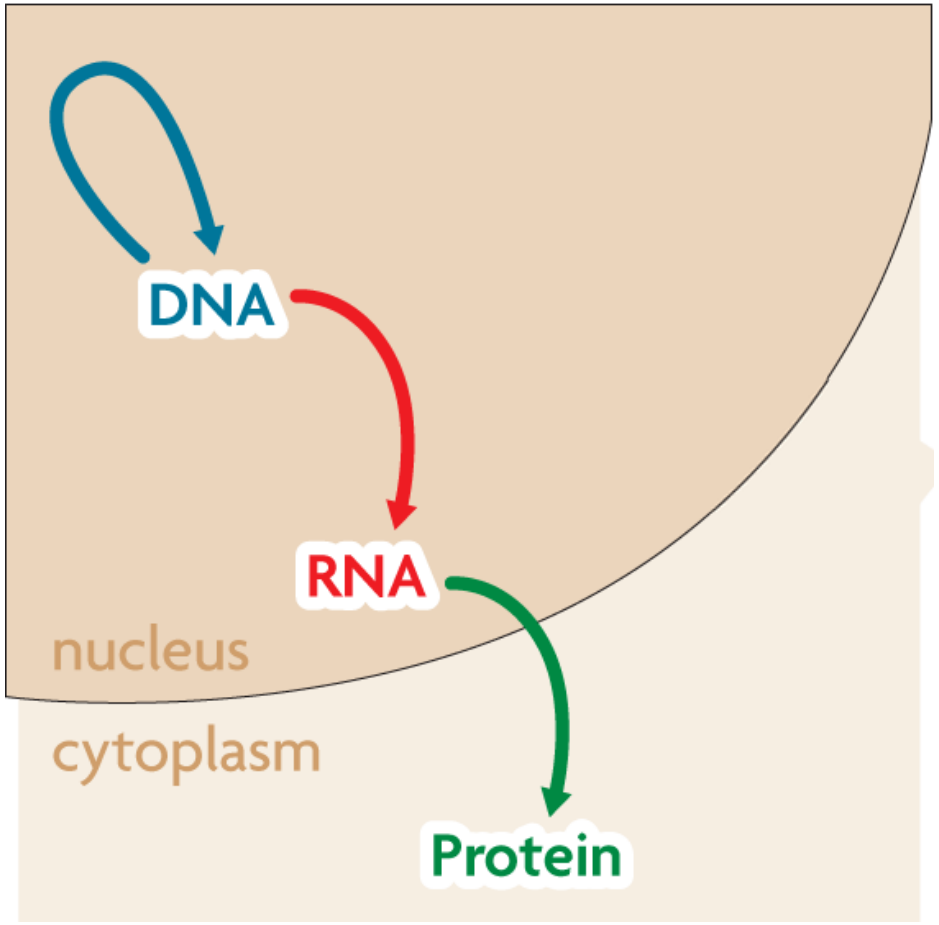
KEY CONCEPT

Transcription converts a gene into a single-stranded RNA molecule.

8.4 Transcription

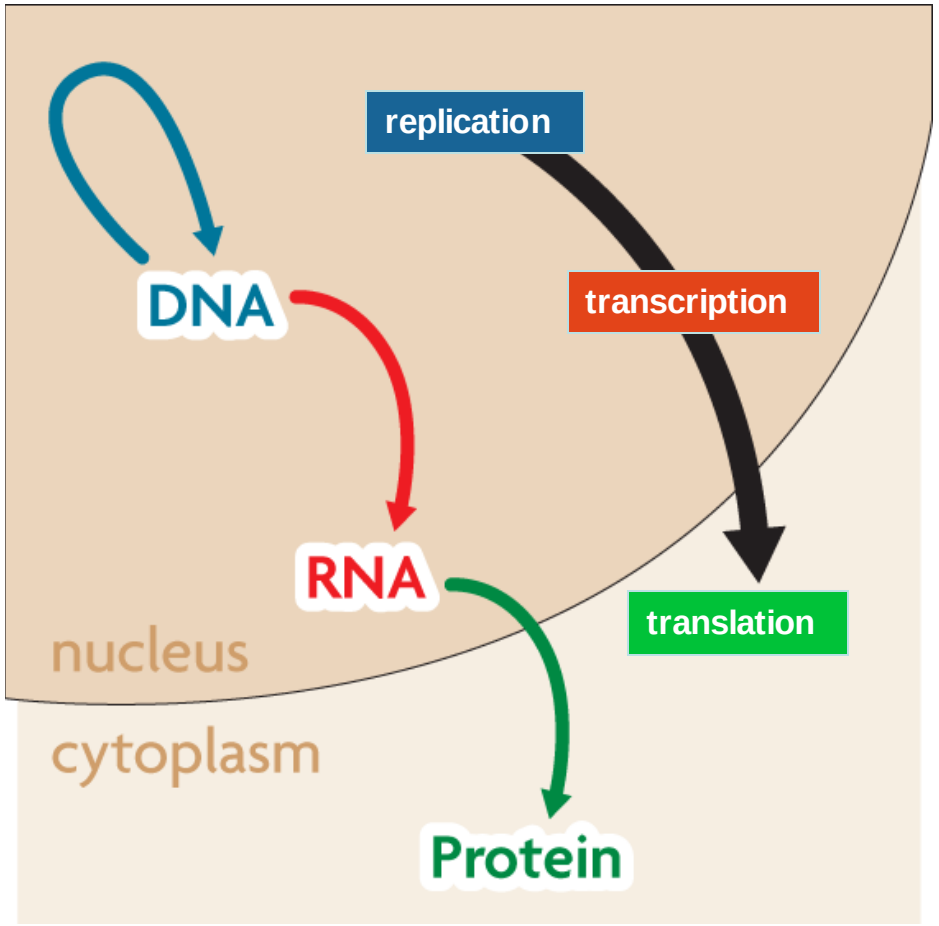
RNA carries DNA's instructions.

- The central dogma states that information flows in one direction from DNA to RNA to proteins.



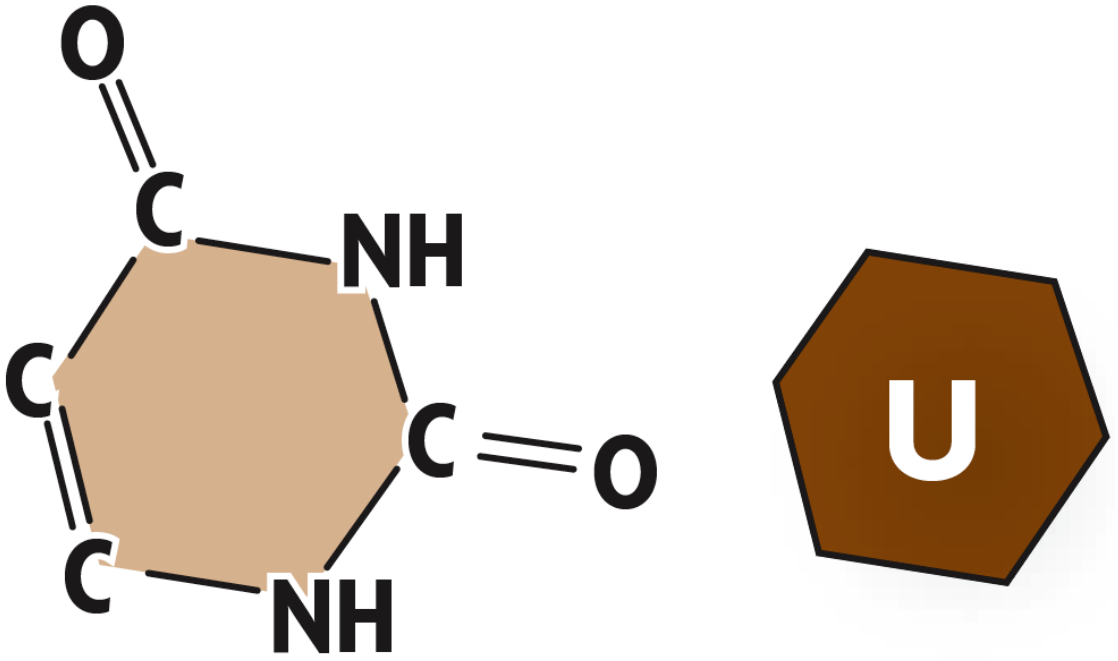
8.4 Transcription

- The central dogma includes three processes.
  - Replication
  - Transcription
  - Translation
- RNA is a link between DNA and proteins.



8.4 Transcription

- RNA differs from DNA in three major ways.
  - RNA has a ribose sugar.
  - RNA has uracil instead of thymine.
  - RNA is a single-stranded structure.



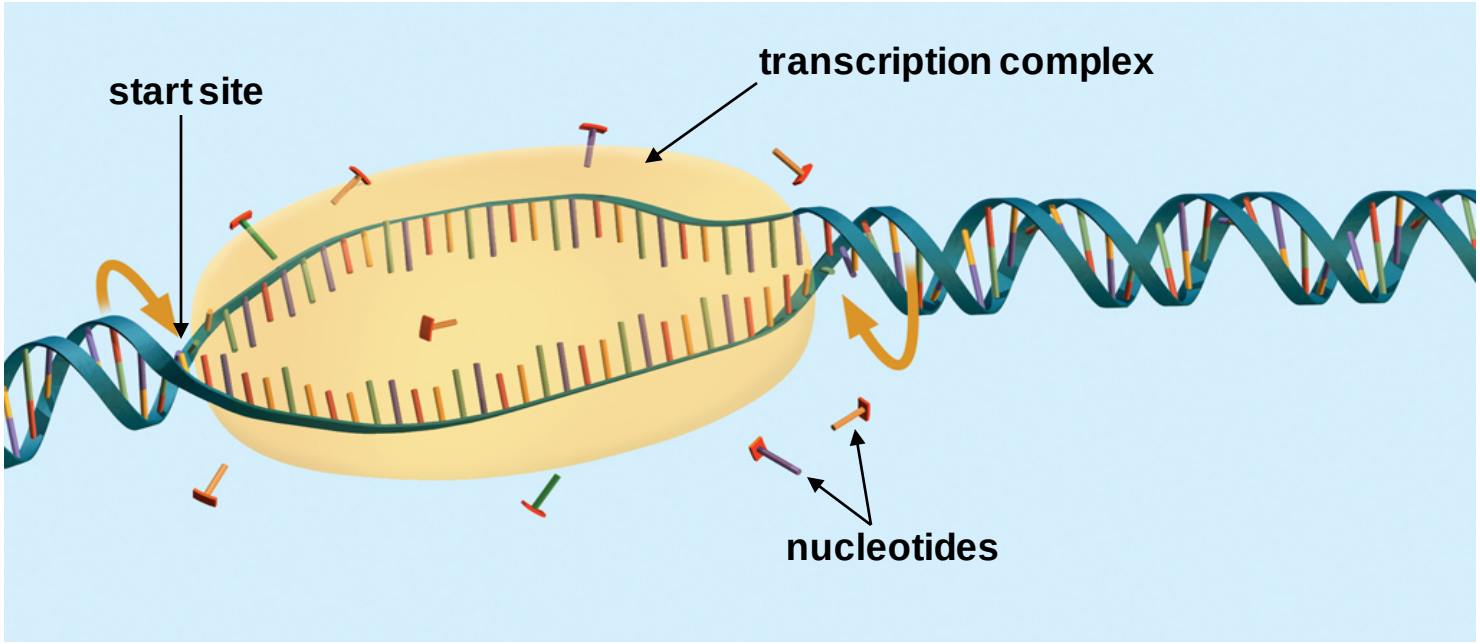
8.4 Transcription

Transcription makes three types of RNA.

- Transcription copies DNA to make a strand of RNA.

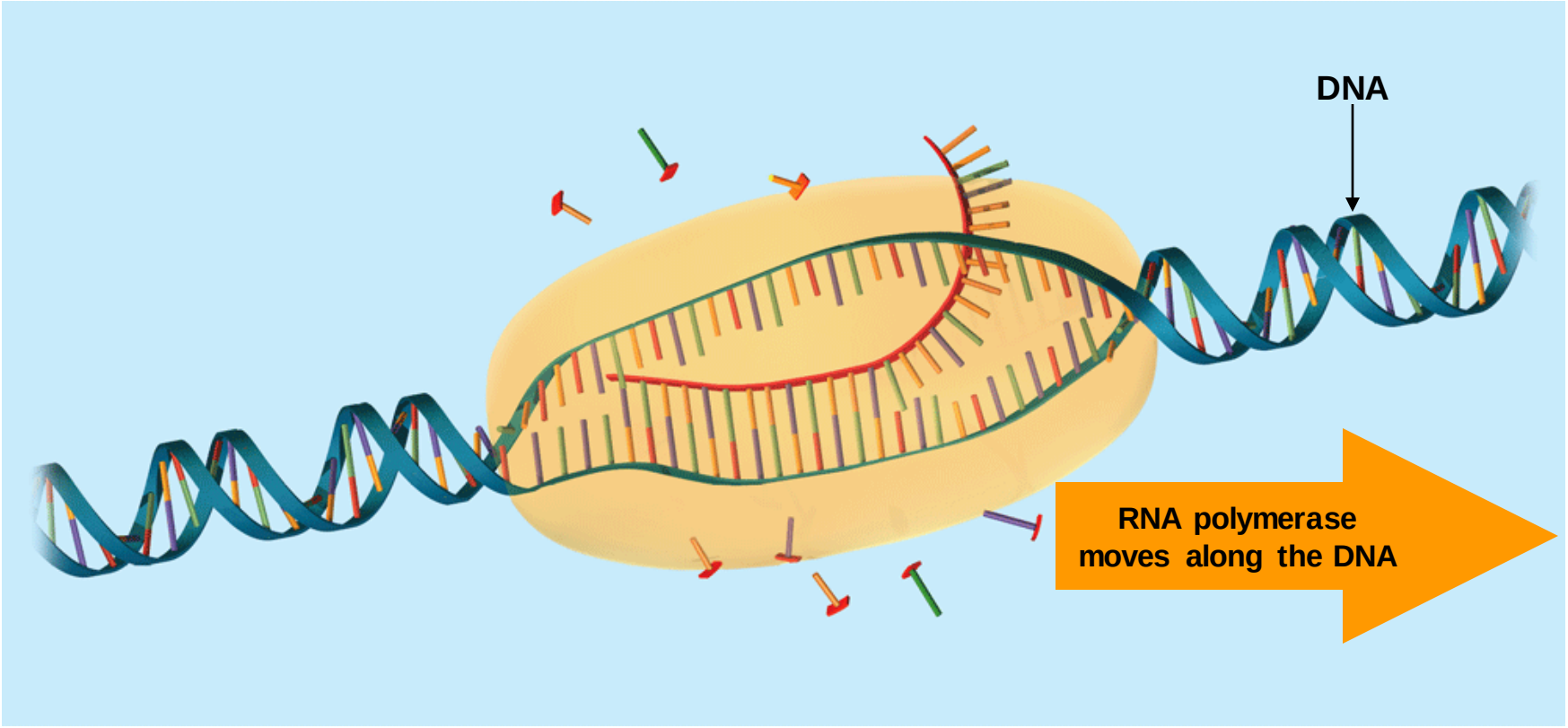
8.4 Transcription

- Transcription is catalyzed by RNA polymerase.
  - RNA polymerase and other proteins form a transcription complex.
  - The transcription complex recognizes the start of a gene and unwinds a segment of it.



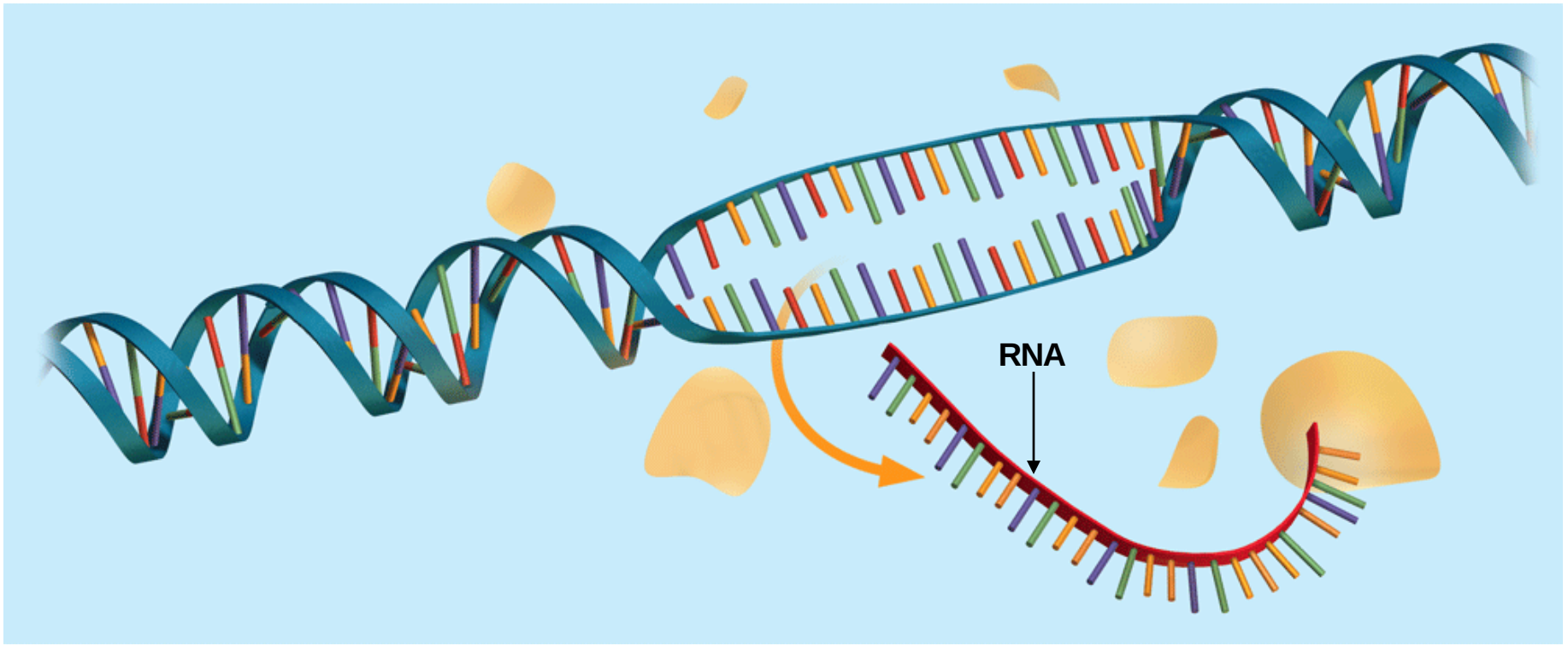
8.4 Transcription

- Nucleotides pair with one strand of the DNA.
- RNA polymerase bonds the nucleotides together.
- The DNA helix winds again as the gene is transcribed.



8.4 Transcription

– The RNA strand detaches from the DNA once the gene is transcribed.



8.4 Transcription

- Transcription makes three types of RNA.
  - Messenger RNA (mRNA) carries the message that will be translated to form a protein.
  - Ribosomal RNA (rRNA) forms part of ribosomes where proteins are made.
  - Transfer RNA (tRNA) brings amino acids from the cytoplasm to a ribosome.

8.4 Transcription

The transcription process is similar to replication.

- Transcription and replication both involve complex enzymes and complementary base pairing.
- The two processes have different end results.
  - Replication copies all the DNA; transcription copies a gene.
  - Replication makes one copy; transcription can make many copies.