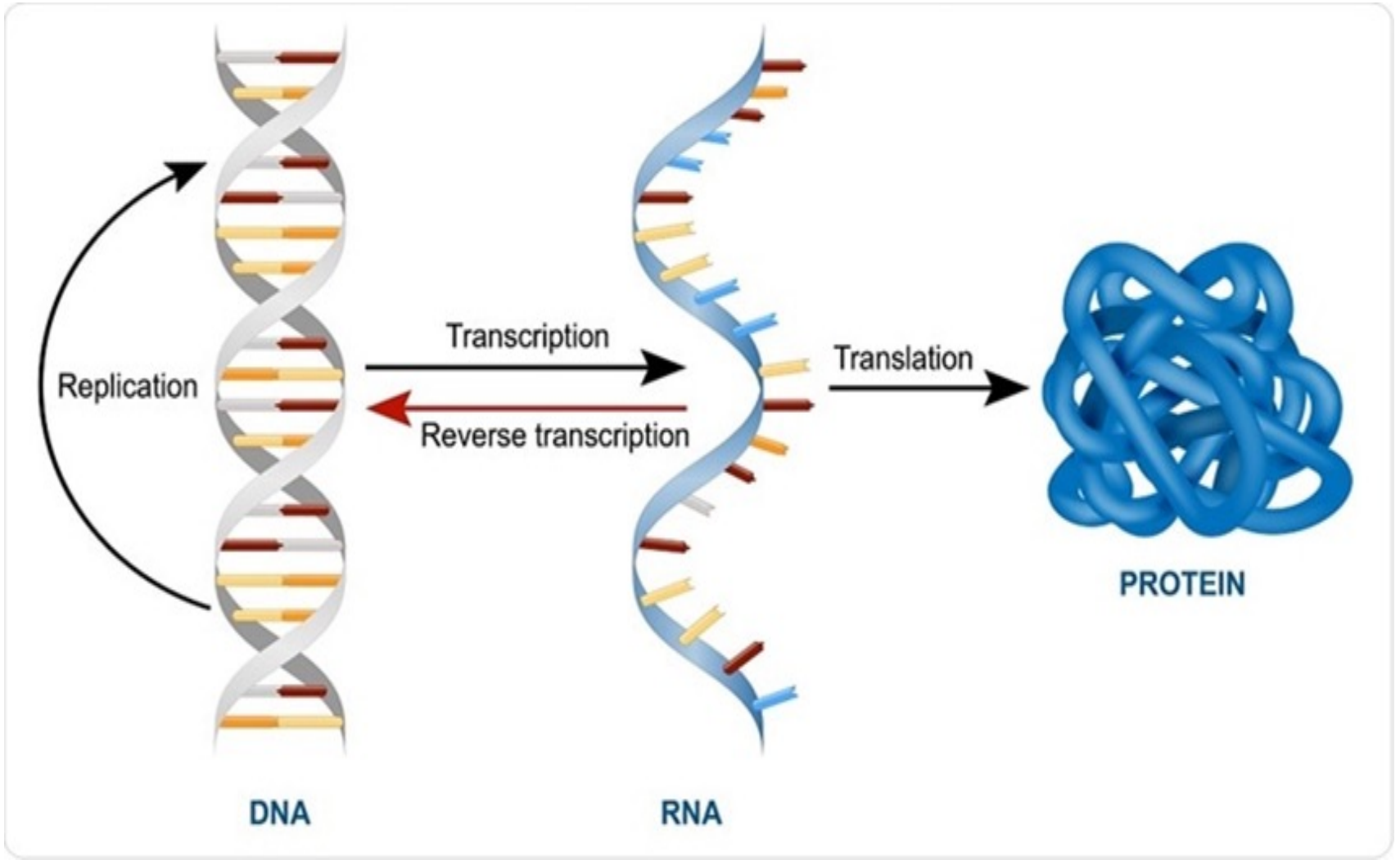
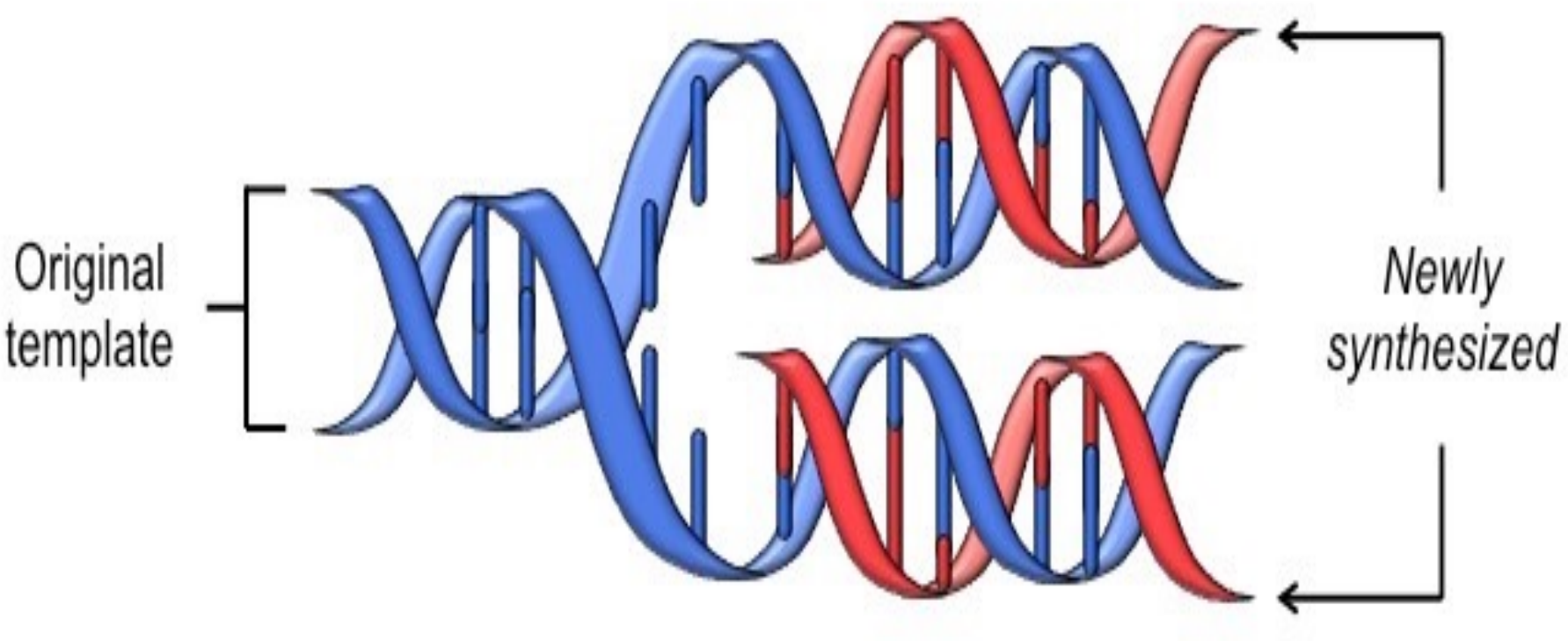
CENTRAL DOGMA AND DNA REPLICATION

Central Dogma- It is the flow of information from DNA to mRNA and then decoding the information present in mRNA in the formation of polypeptide chain or protein



DNA Replication: DNA replication is the biological process of producing two identical replicas of DNA from one original DNA molecule.

- **Semiconservative**



1. **INITIATION- It begins at a particular spot called origin of replication. It usually rich in AT and contain ARS (autonomously replicating sequences).**

2. Activation of Deoxyribonucleotides- deAMP, deGMP, deCMP, deTMP

3. Exposure of DNA strand –

- **Helicase- Unwind the DNA helix and separate the two strands**
- **Topoisomerase- relieve the stress**
- **Single strand binding proteins – Stabilize the separated strands**

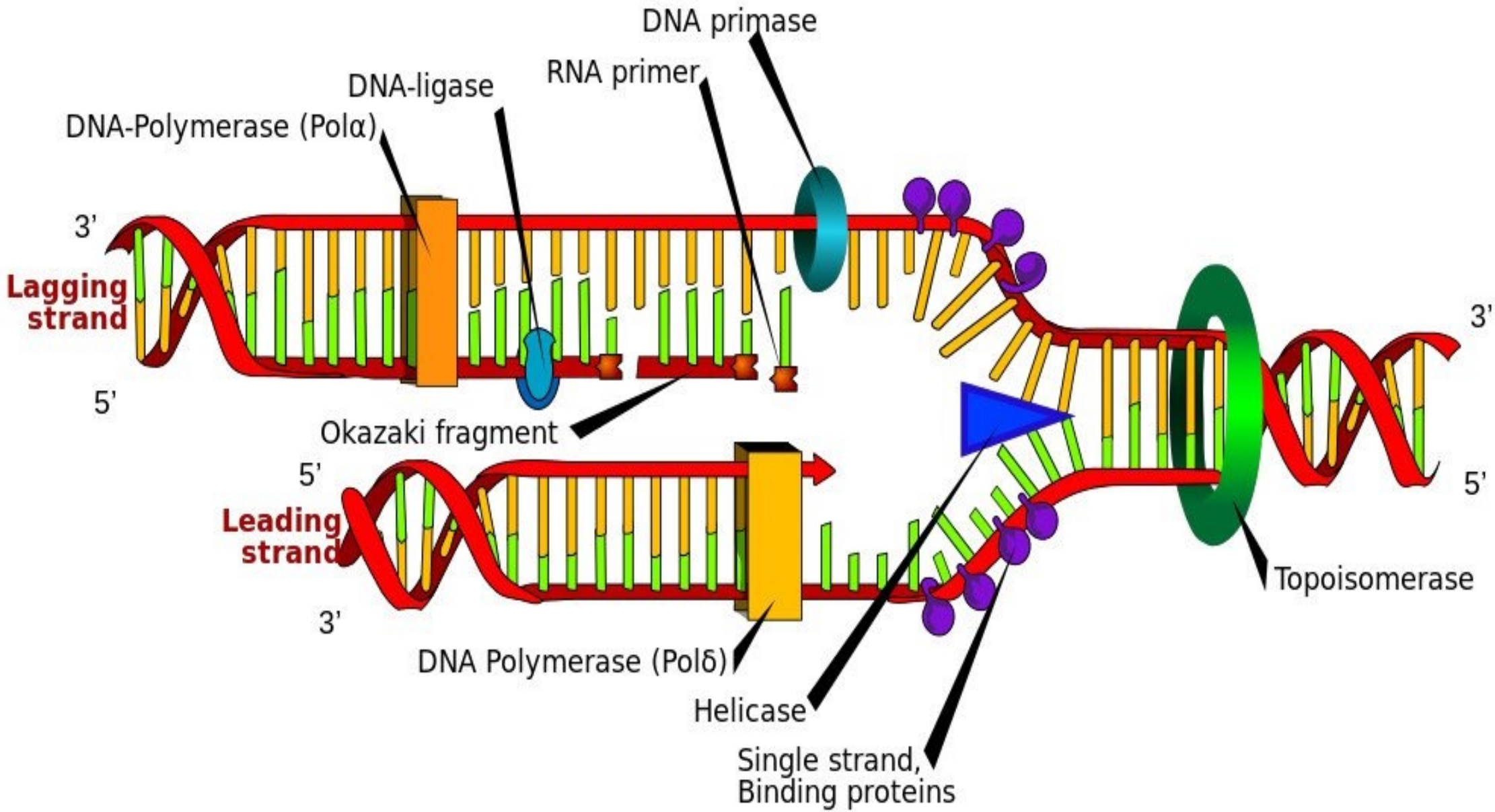
4. Pre-priming and Priming-

- **RNA primer- it is 4-12 nuclrotide long RNA and Synthetises with the help of enzyme primase.**

5. Base Pairing-

6. Chain Formation – Require enzyme DNA Polymerase III, Mg, ATP and TPP

7. Proof Reading and DNA Repair – DNA Polymerase I


DNA primase
RNA primer
DNA-ligase
DNA-Polymerase (Polα)
3'
Lagging strand
5'
Okazaki fragment
5'
Leading strand
3'
DNA Polymerase (Polδ)
Helicase
Single strand, Binding proteins
Topoisomerase
3'
5'

Leading Strand:

1. It is a replicated strand of DNA which grows continuously without any gap.
2. It does not require DNA ligase for its growth.
3. The direction of growth of the leading strand is 5′ —> 3
4. Only a single RNA primer is required.

Lagging Strand:

1. Lagging strand is a replicated strand of DNA which is formed in short segments called Okazaki fragments. Its growth is discontinuous.
2. DNA-ligase is required for joining Okazaki fragments.
3. The direction of growth of the lagging strand is 3′ -» 5′ though in each Okazaki fragment it is 5′ —> 3
4. Starting of each Okazaki fragment requires a new RNA.