



**DNA
REPLICATION
SPECIFICS
START**

CELL

REPLICATION / SPECIFICS

CC

NUCLEUS

A diagram of a cell. The cell is represented by a large, rounded rectangular shape with a thick grey border. Inside the cell, there is a large, solid blue circle representing the nucleus. The word "NUCLEUS" is written in white, uppercase letters across the top of the blue circle. The word "CYTOSOL" is written in grey, uppercase letters at the bottom of the cell, centered horizontally.

CYTOSOL

CELL

REPLICATION / SPECIFICS

I

NUCLEUS

CELL CYCLE

CYTOSOL

CELL

REPLICATION / SPECIFICS

L

NUCLEUS

INTERPHASE

CYTOSOL

CELL

REPLICATION / SPECIFICS

R

NUCLEUS

INTERPHASE

LOCATION

CYTOSOL

CELL

REPLICATION / SPECIFICS

C

NUCLEUS

INTERPHASE

REPLICATION

CYTOSOL

CELL

REPLICATION / SPECIFICS

D

NUCLEUS

CHROMOSOME



INTERPHASE

REPLICATION

CYTOSOL

CELL

REPLICATION / SPECIFICS



NUCLEUS

CHROMOSOME



DNA

INTERPHASE

REPLICATION

CYTOSOL

REPLICATION - SPECIFICS



CHROMOSOME



REPLICATION - SPECIFICS

DNA



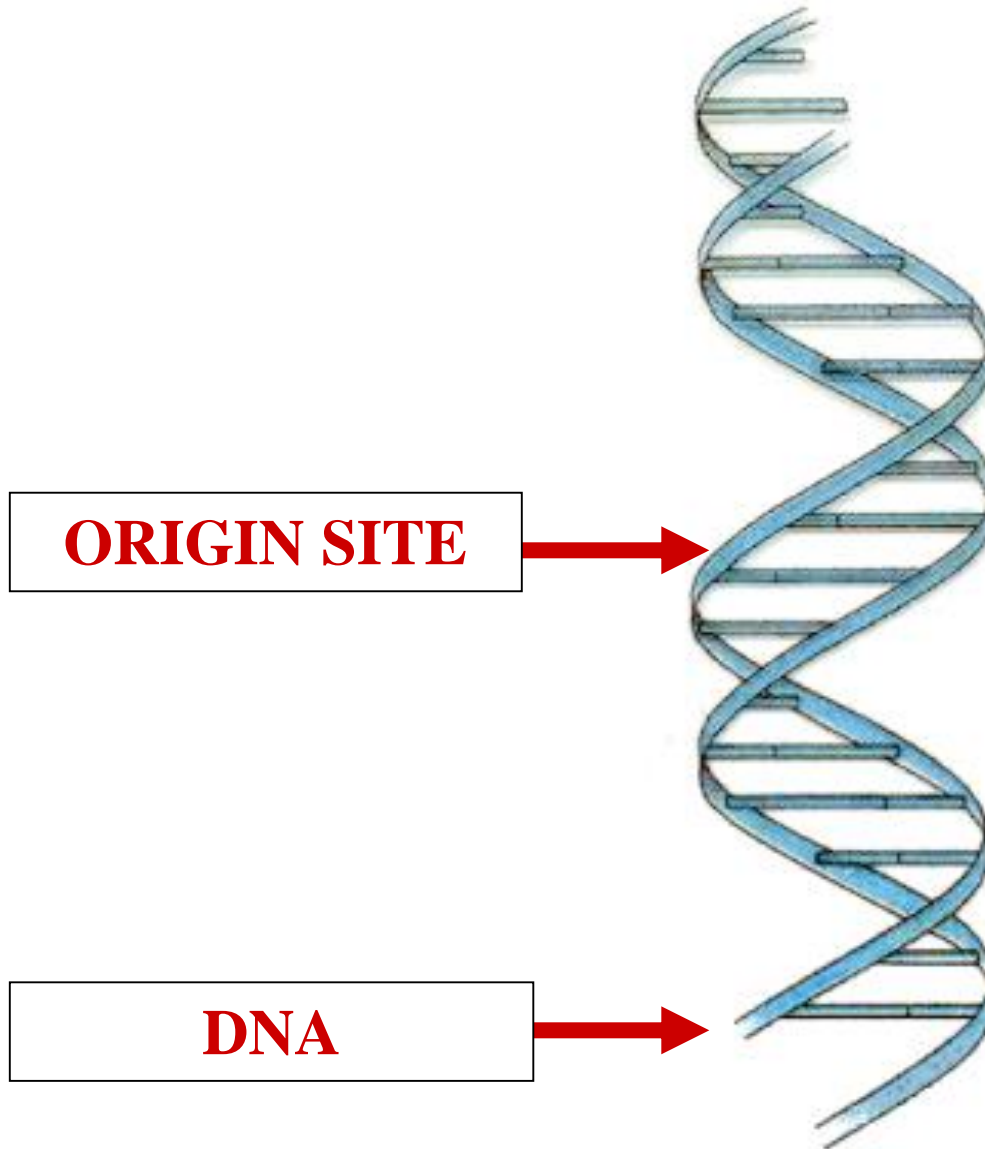
ORIGIN SITE

ORIGIN SITE

**DNA
REPLICATION
STARTS**

ORIGIN SITE

REPLICATION - SPECIFICS



TOPOISOMERASE



TOPOISOMERASE

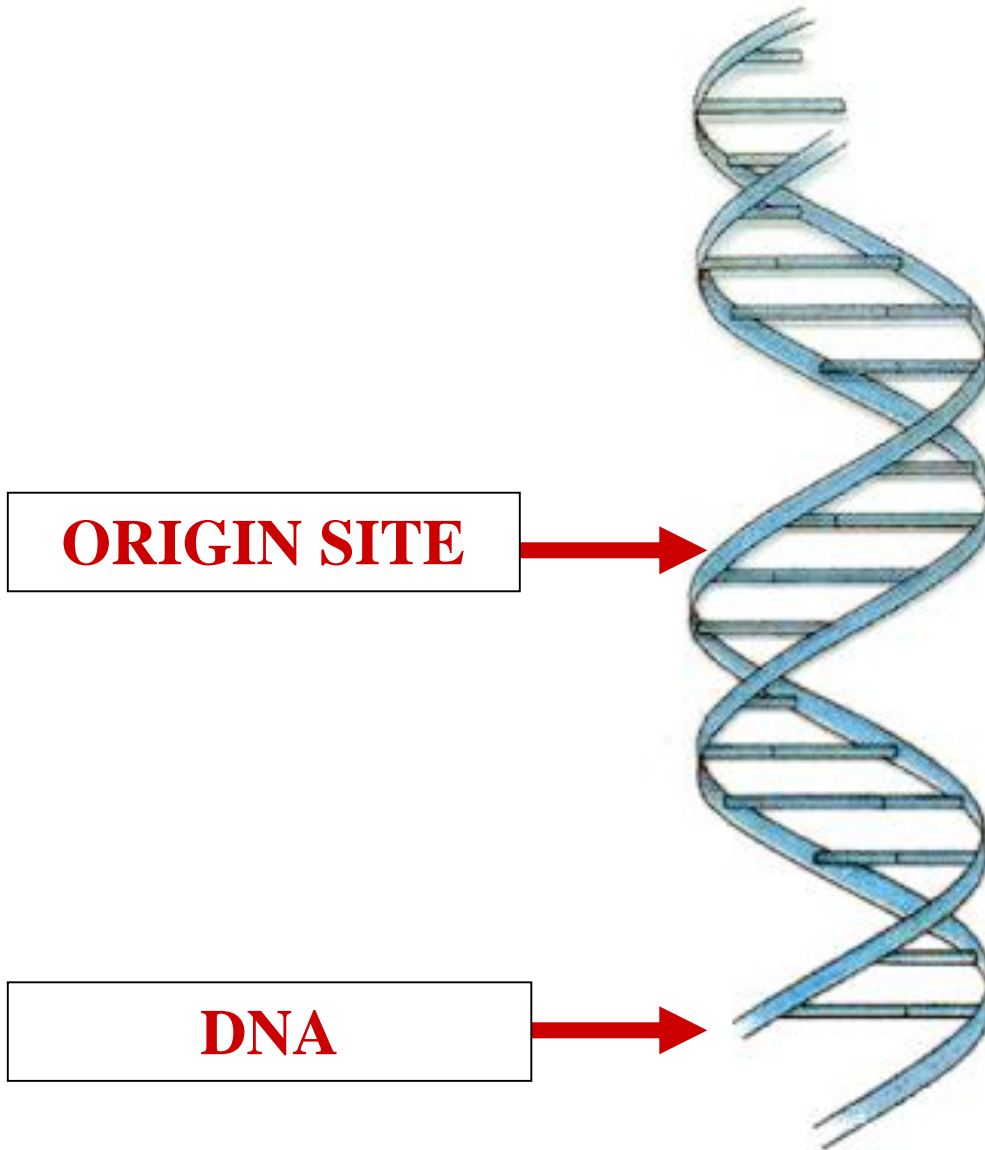
RECOGNIZES

ORIGIN SITE

UNWINDS DNA HELIX

TOPOISOMERASE

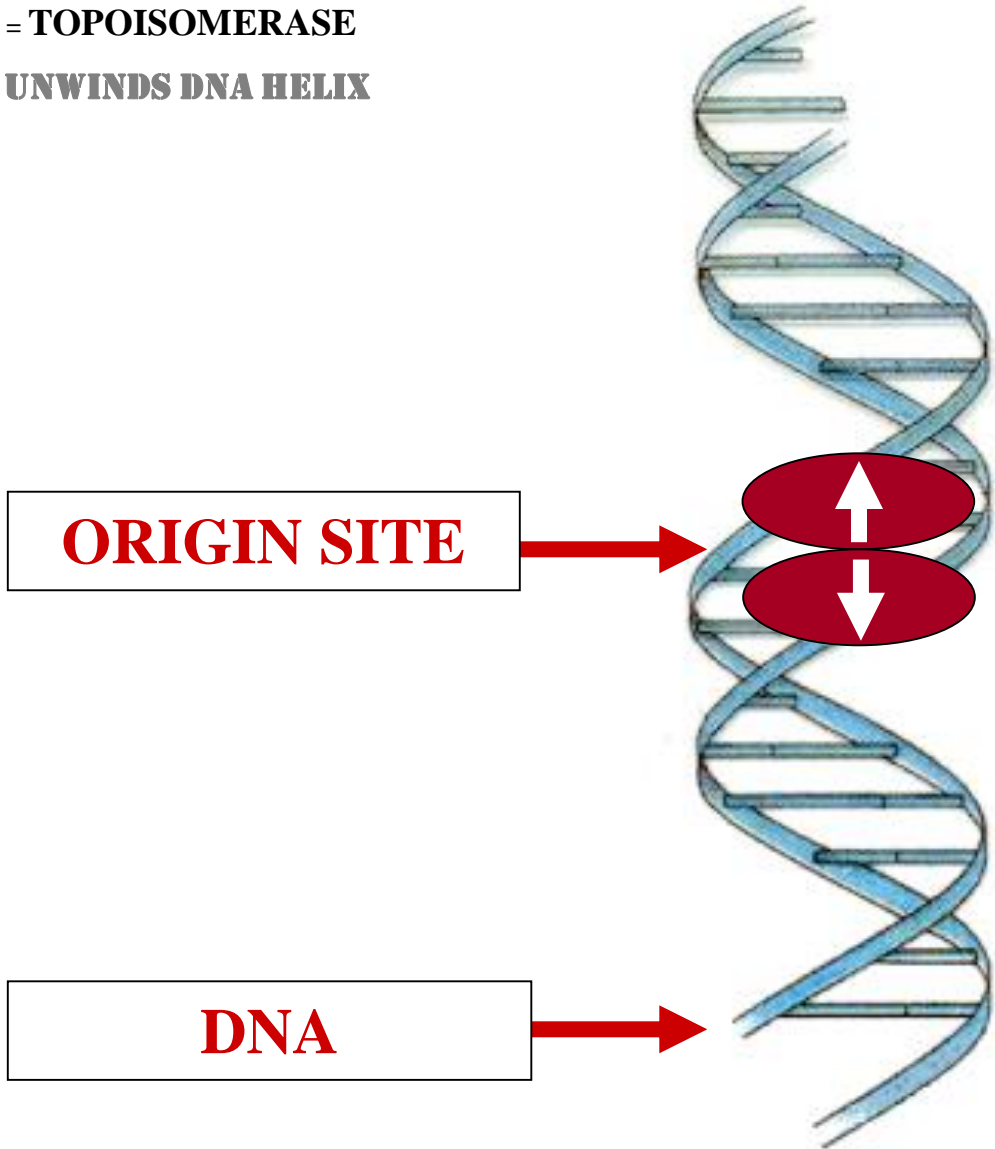
REPLICATION - SPECIFICS



REPLICATION - SPECIFICS



 = TOPOISOMERASE
UNWINDS DNA HELIX



REPLICATION - SPECIFICS

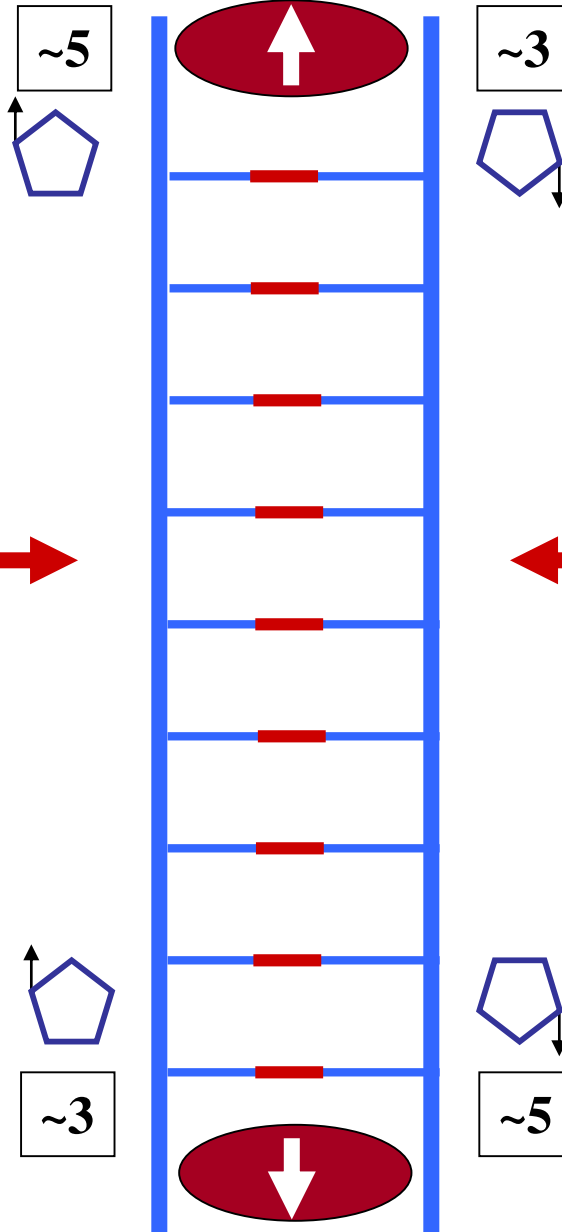
 = TOPOISOMERASE
UNWINDS DNA HELIX

 = HYDROGEN BOND

 = DEOXYRIBOSE

UNWINDS DNA HELIX 

 UNWINDS DNA HELIX



HELICASE



HELICASE

BREAKS

**H-BONDS BETWEEN
CPL-STRANDS**

HELICASE

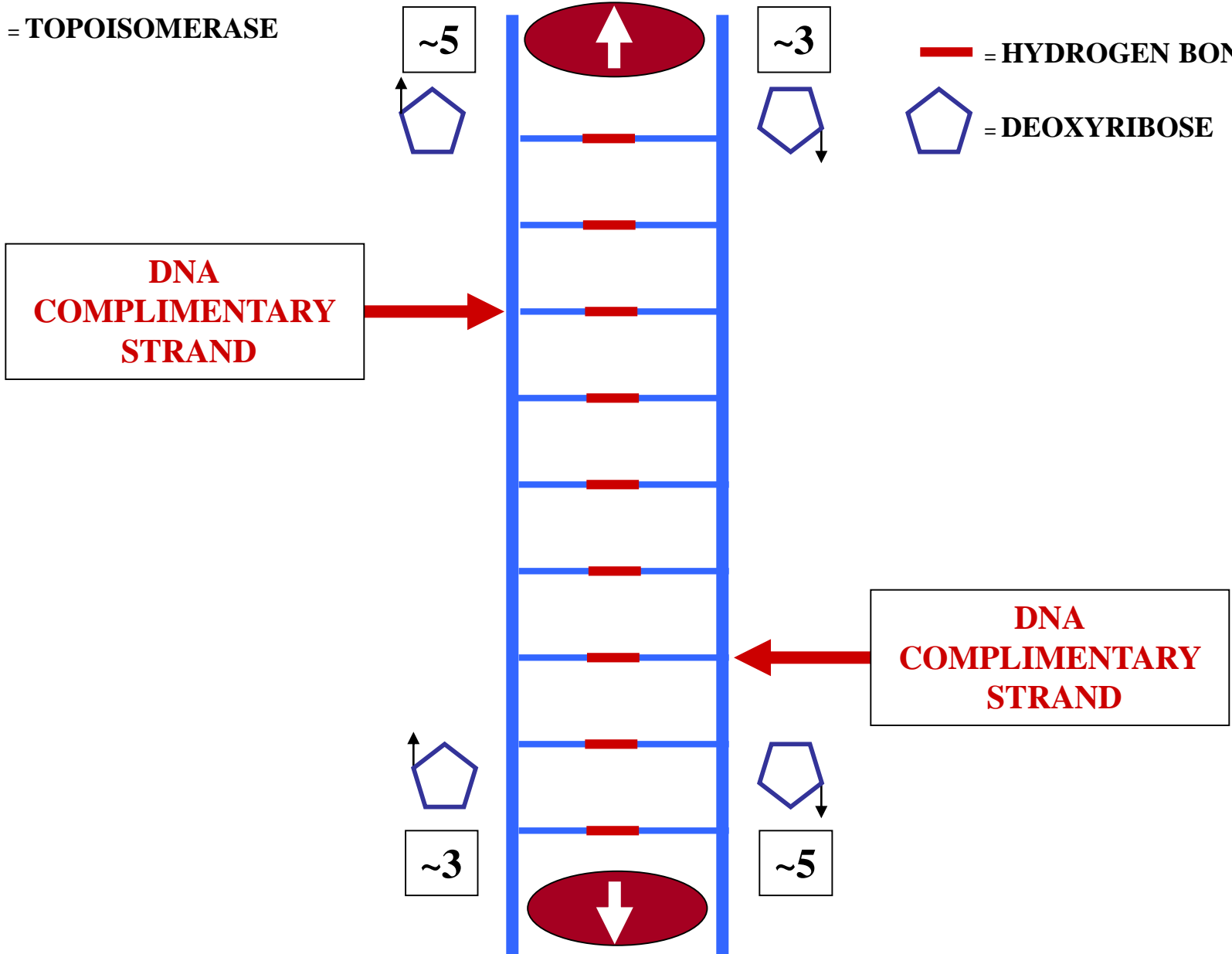
REPLICATION - SPECIFICS



 = TOPOISOMERASE

 = HYDROGEN BOND

 = DEOXYRIBOSE



REPLICATION - SPECIFICS



 = TOPOISOMERASE

 = HELICASE

**BREAKS H-BONDS
BETWEEN CPL - STRANDS**

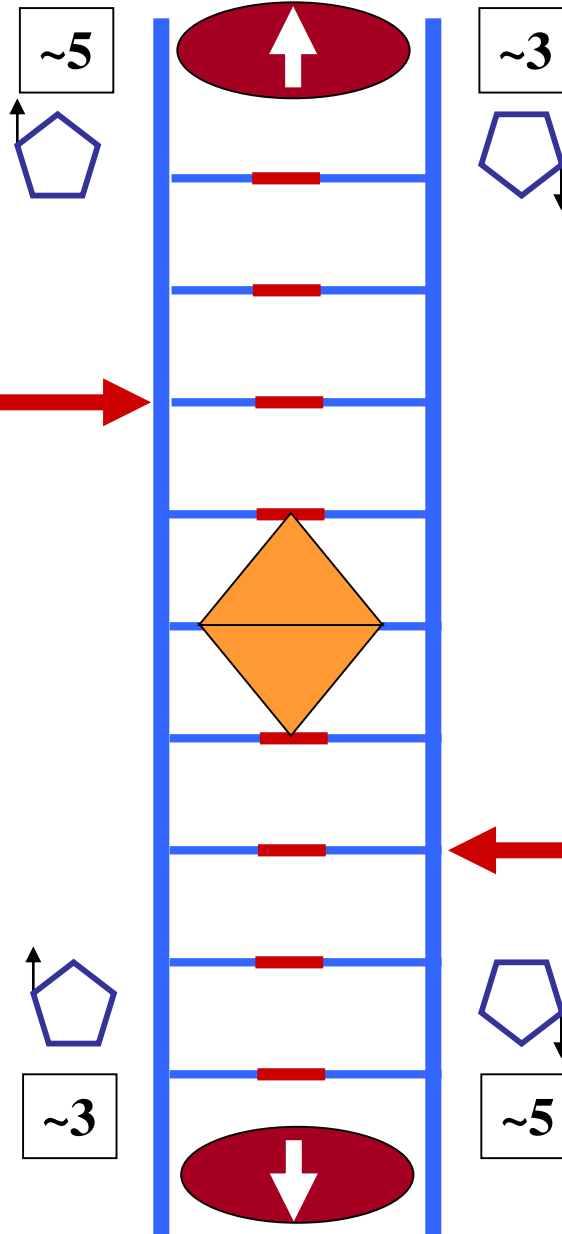
 = HYDROGEN BOND

 = DEOXYRIBOSE

**DNA
COMPLIMENTARY
STRAND**



**DNA
COMPLIMENTARY
STRAND**



REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

**BREAKS H-BONDS
BETWEEN CPL - STRANDS**

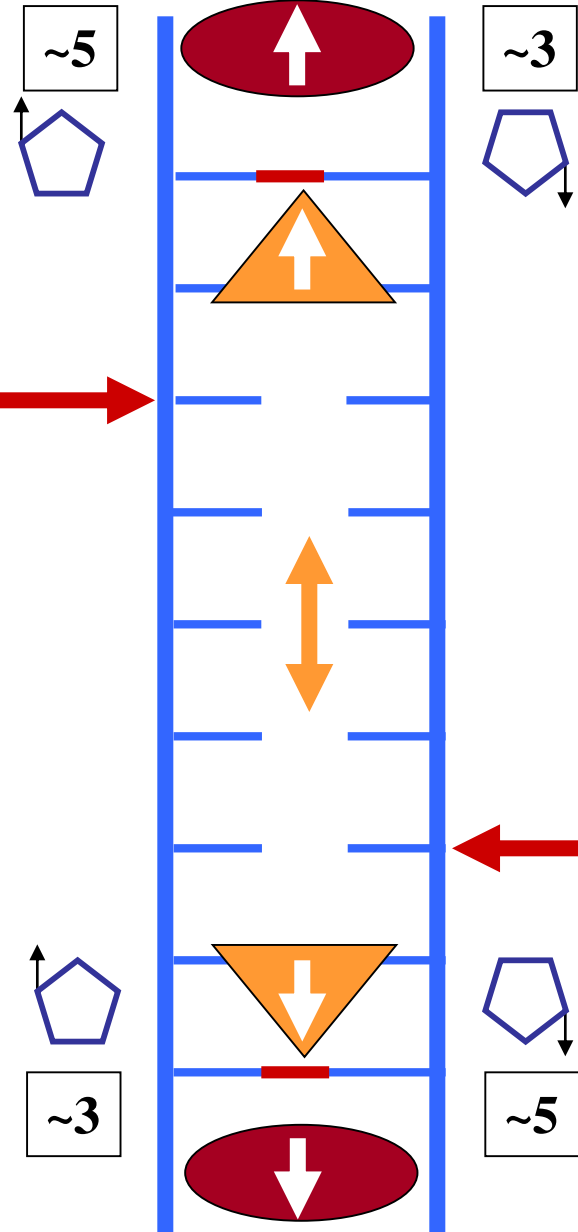
 = HYDROGEN BOND

 = DEOXYRIBOSE

**DNA
COMPLIMENTARY
STRAND**



**DNA
COMPLIMENTARY
STRAND**



REPLICATION BUBBLE





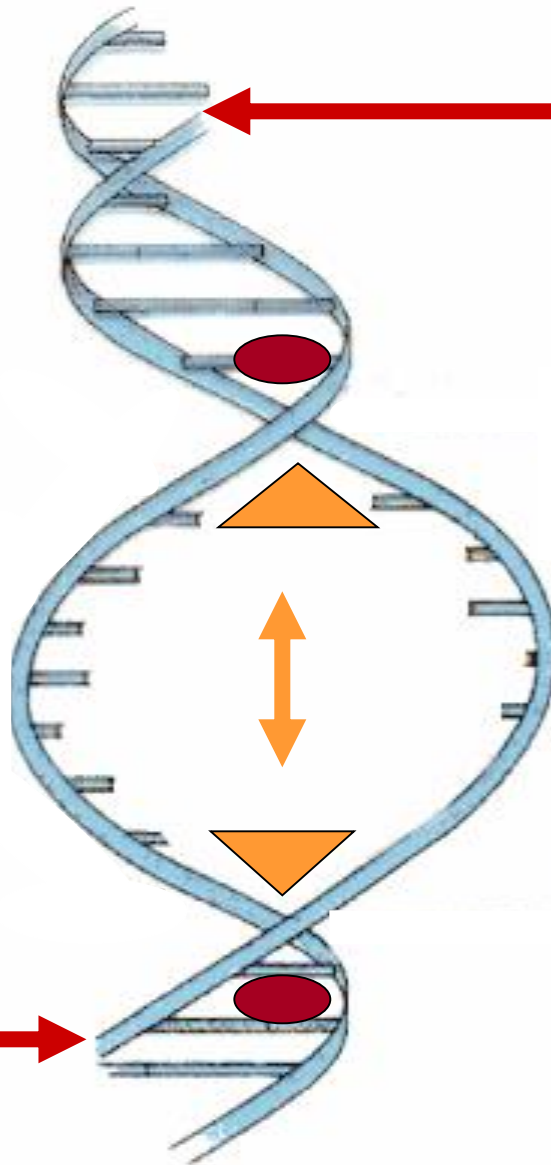
REPLICATION BUBBLE

**EXPOSED
CPL-STRANDS**

REPLICATION BUBBLE

REPLICATION - SPECIFICS

-  = TOPOISOMERASE
-  = HELICASE
BREAKS H-BONDS
BETWEEN CPL - STRANDS



**DNA
COMPLIMENTARY
STRAND**

**REPILCATION
BUBBLE**

**DNA
COMPLIMENTARY
STRAND**

REPLICATION - SPECIFICS

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 = HELICASE

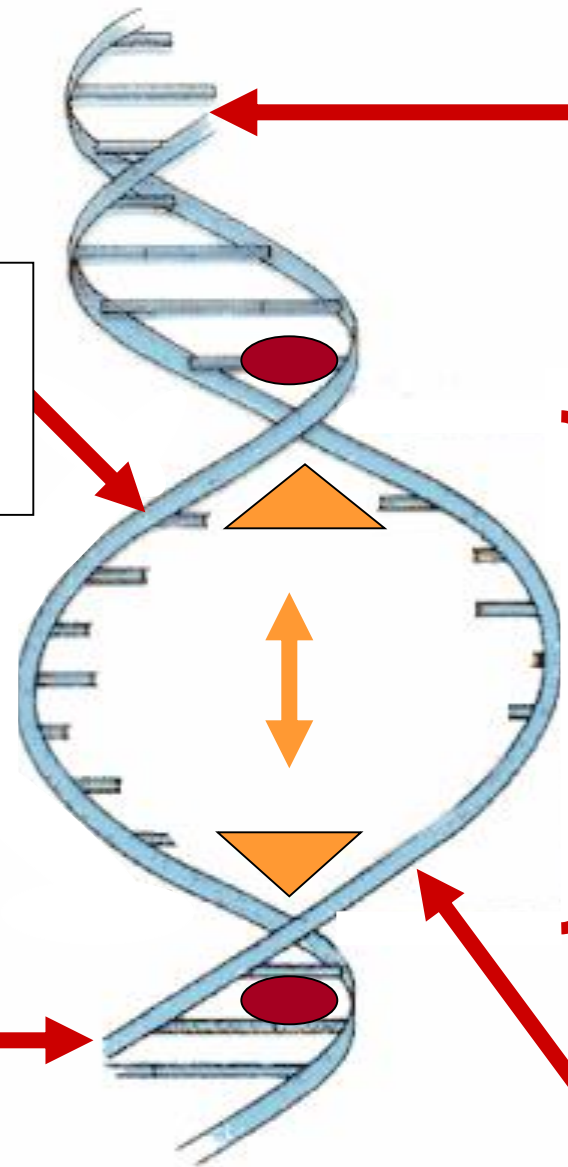
**EXPOSED
COMPLIMENTARY
STRAND**

**DNA
COMPLIMENTARY
STRAND**

**REPLICATION
BUBBLE**

**DNA
COMPLIMENTARY
STRAND**

**EXPOSED
COMPLIMENTARY
STRAND**



REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

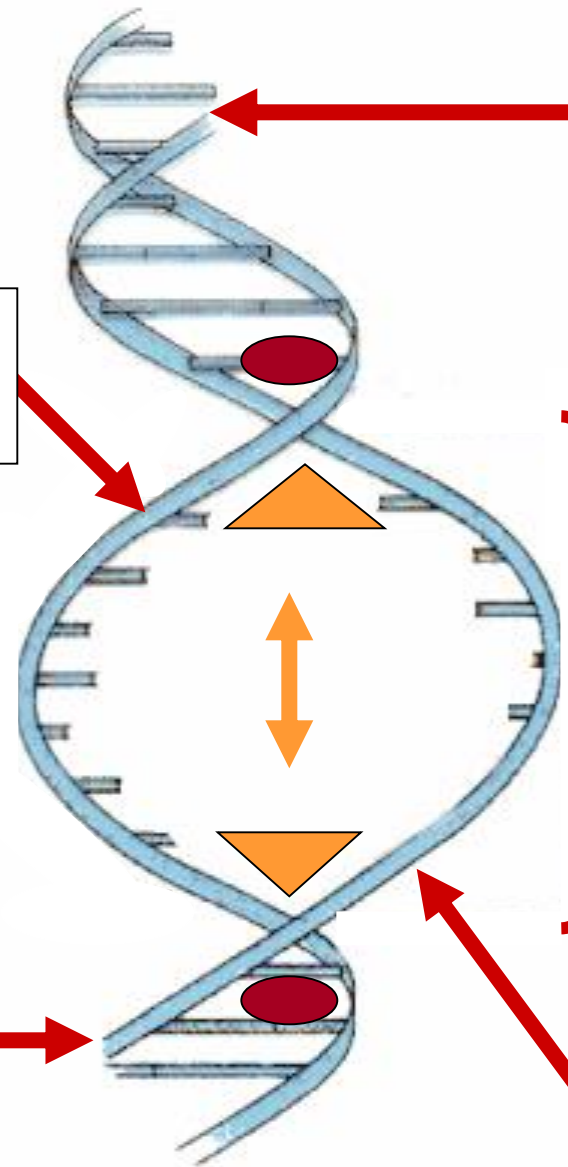
PARENTAL STRAND

DNA COMPLEMENTARY STRAND

REPLICATION BUBBLE

DNA COMPLEMENTARY STRAND

PARENTAL STRAND



REPLICATION - SPECIFICS



 = TOPOISOMERASE

 = HELICASE

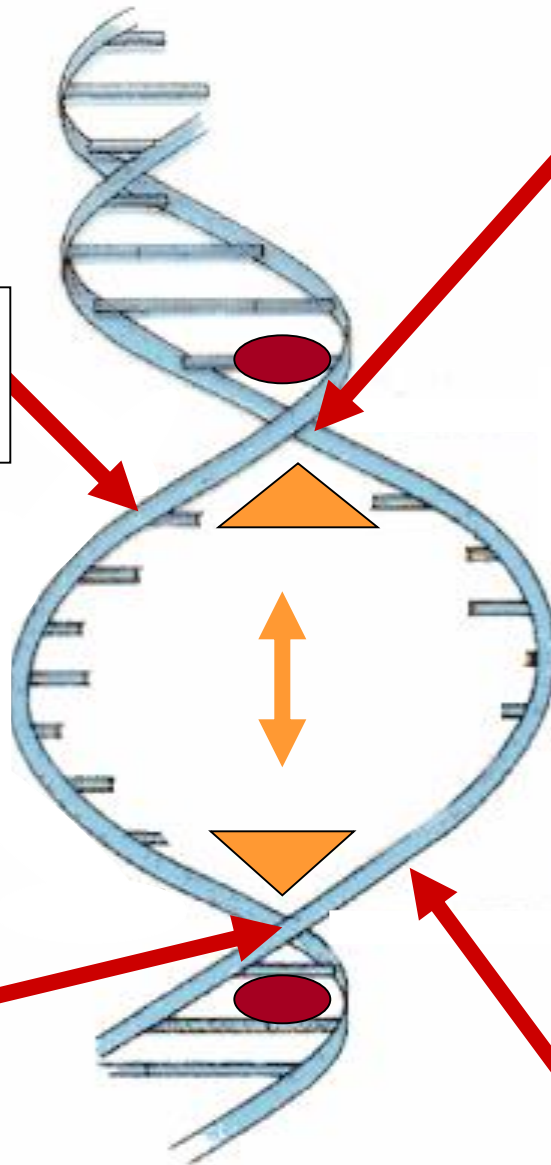
**PARENTAL
STRAND**

**UPPER
REPLICATION
FORK**

**REPLICATION
BUBBLE**

**LOWER
REPLICATION
FORK**

**PARENTAL
STRAND**



REPLICATION - SPECIFICS



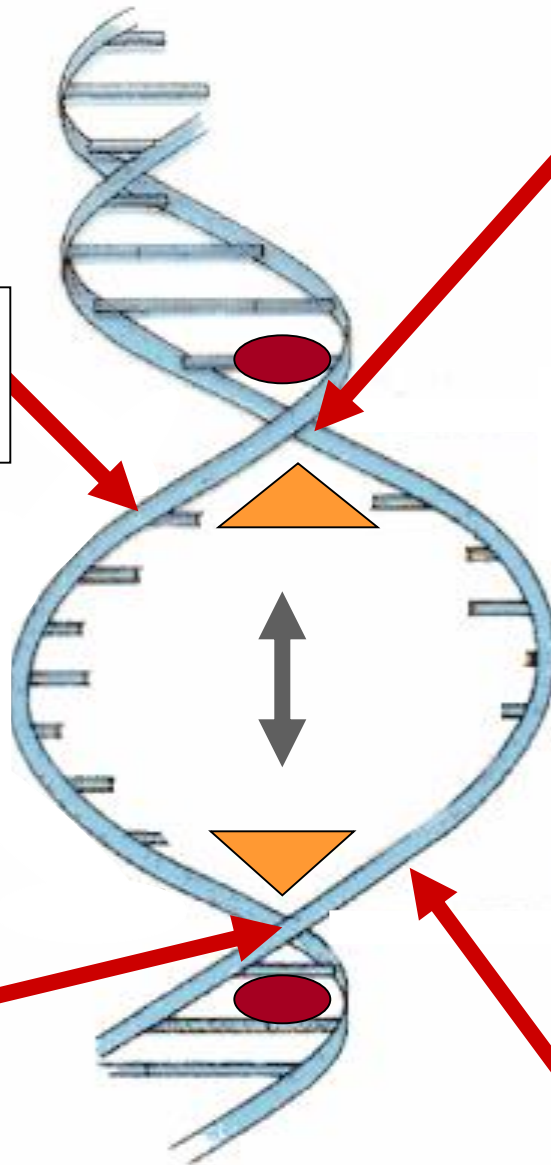
 = TOPOISOMERASE

 = HELICASE

**PARENTAL
STRAND**

**DNA-REP
OCCURS ALONG
BOTH REP-FORKS
CONCURRENTLY**

**LOWER
REPLICATION
FORK**



**UPPER
REPLICATION
FORK**

**REPLICATION
BUBBLE**

**PARENTAL
STRAND**

REPLICATION - SPECIFICS

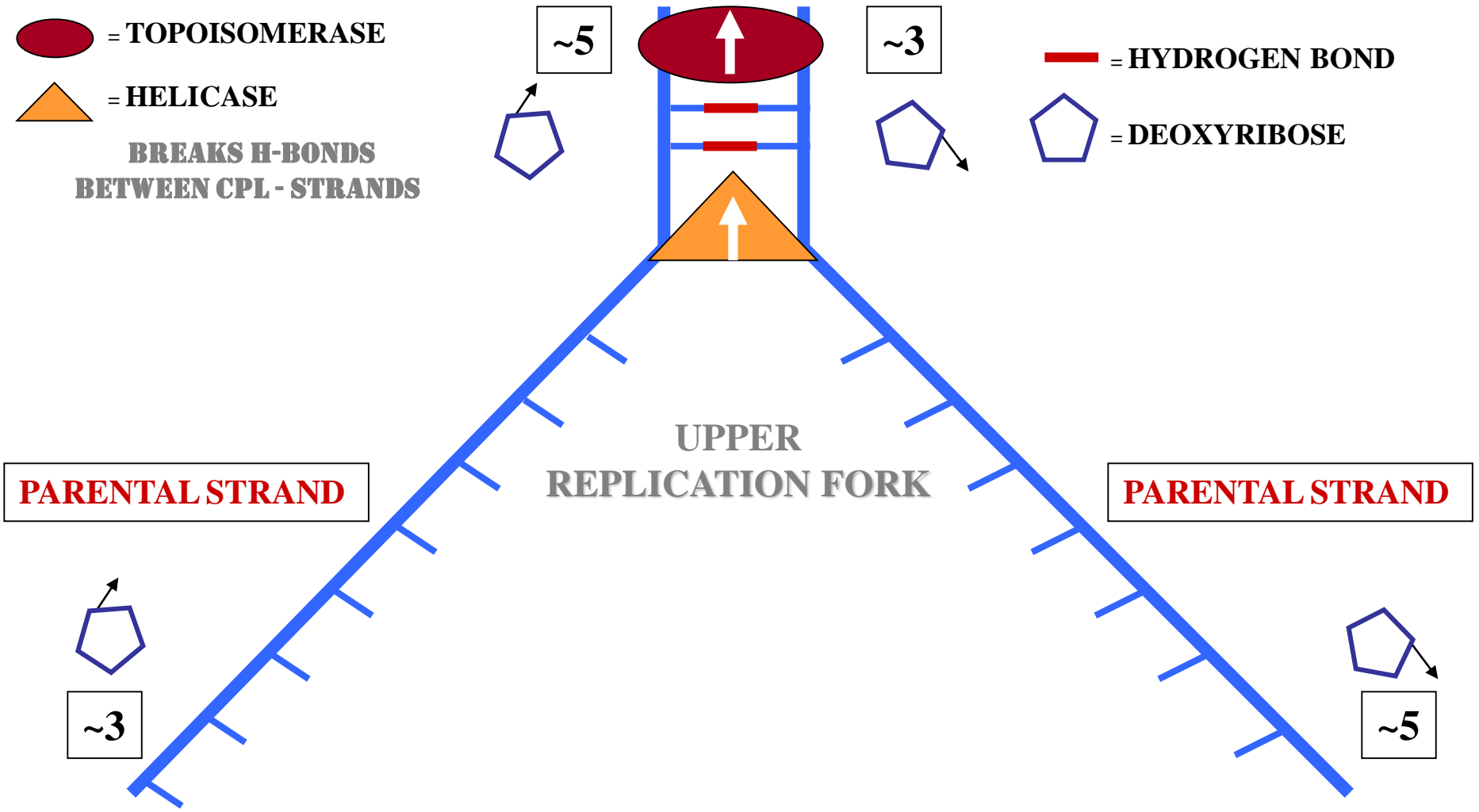
 = TOPOISOMERASE

 = HELICASE

**BREAKS H-BONDS
BETWEEN CPL - STRANDS**

 = HYDROGEN BOND

 = DEOXYRIBOSE



BINDING PROTEINS



BINDING PROTEINS

**BIND WITH
PARAENTAL STRANDS**

**STABALIZE
REPLICATION FORK**

BINDING PROTEINS

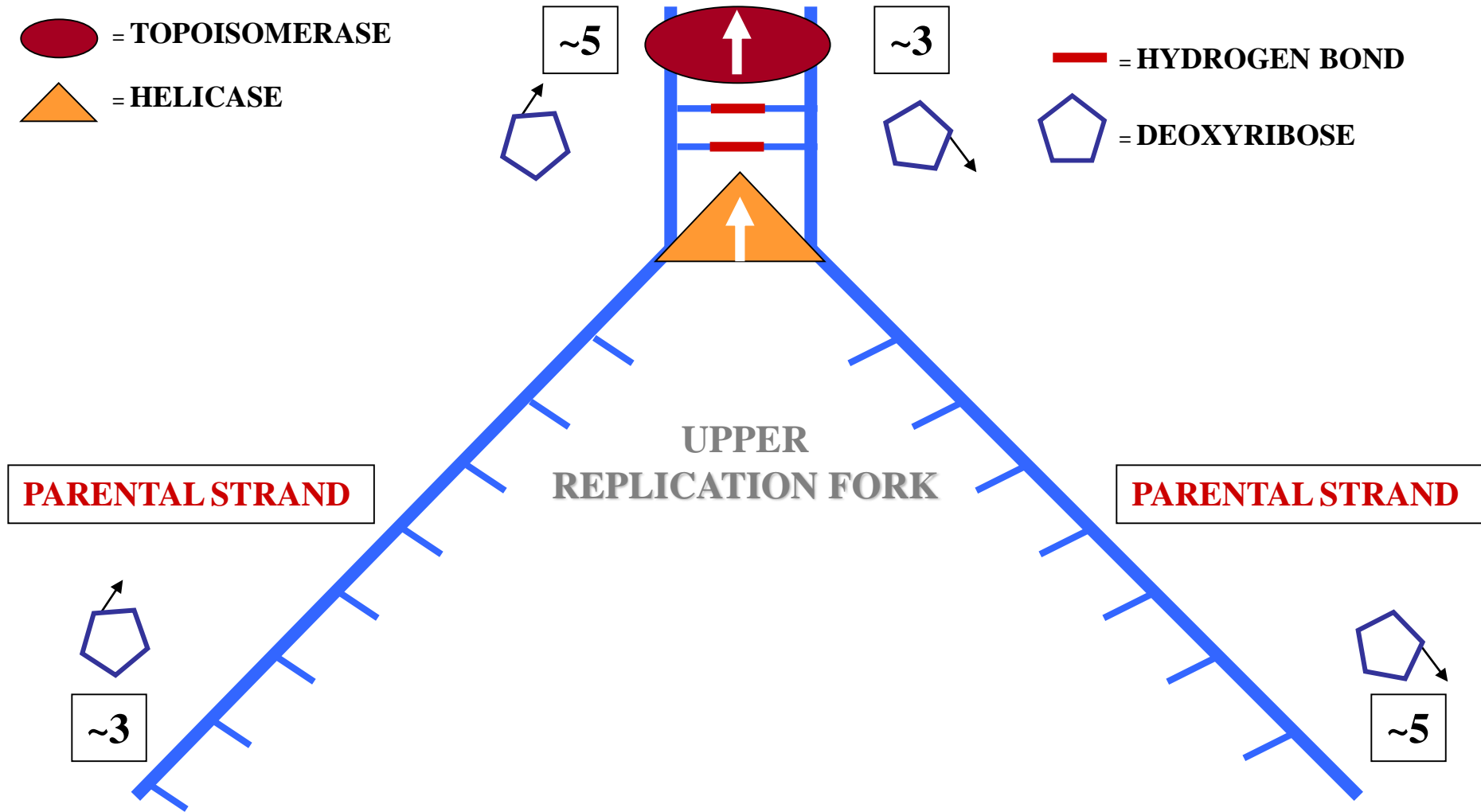
REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

 = HYDROGEN BOND

 = DEOXYRIBOSE



PRIMASE



PRIMASE

**INITIATES
DNA
REPLICATION**

PRIMASE

REPLICATION - SPECIFICS

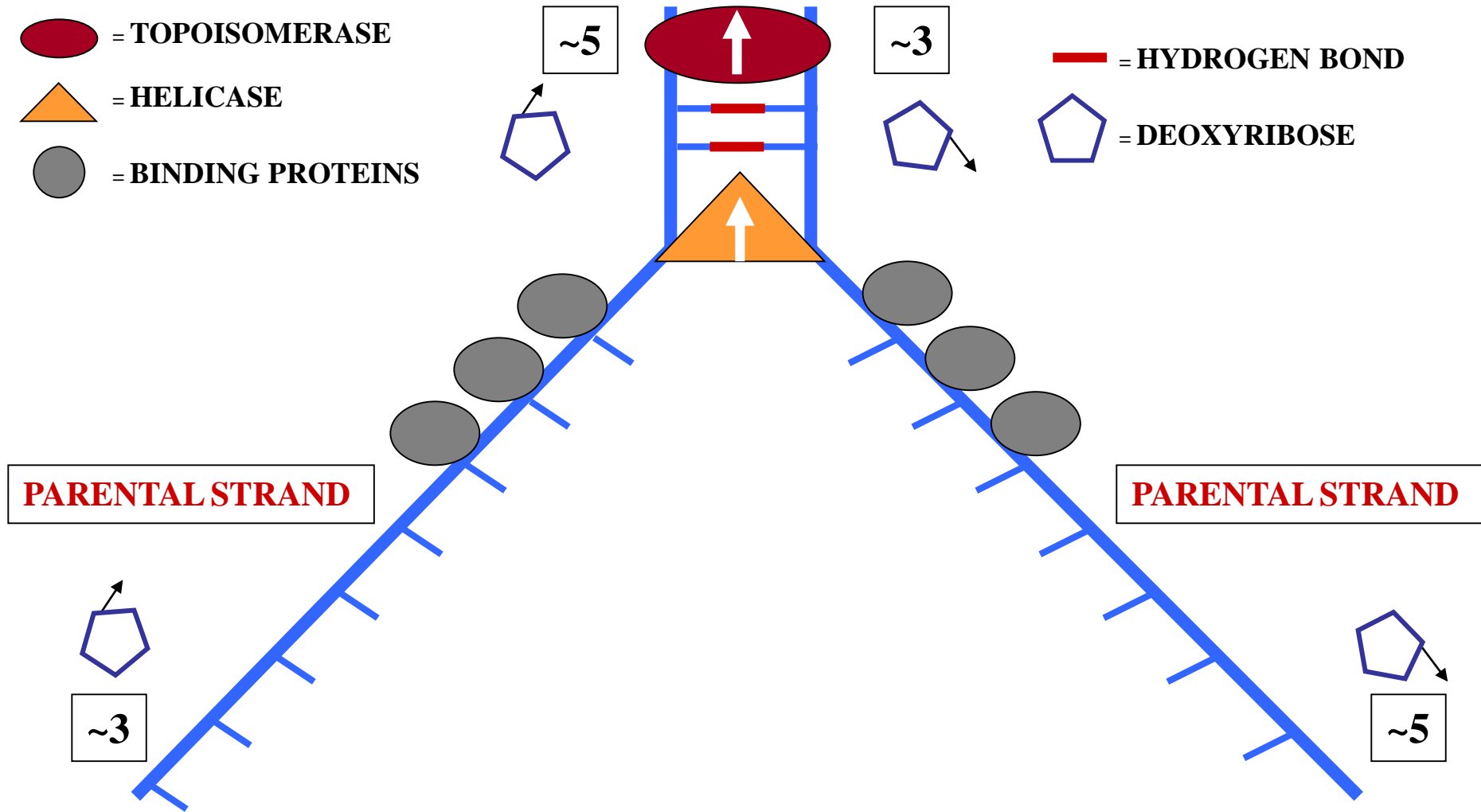
 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

 = HYDROGEN BOND

 = DEOXYRIBOSE




REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

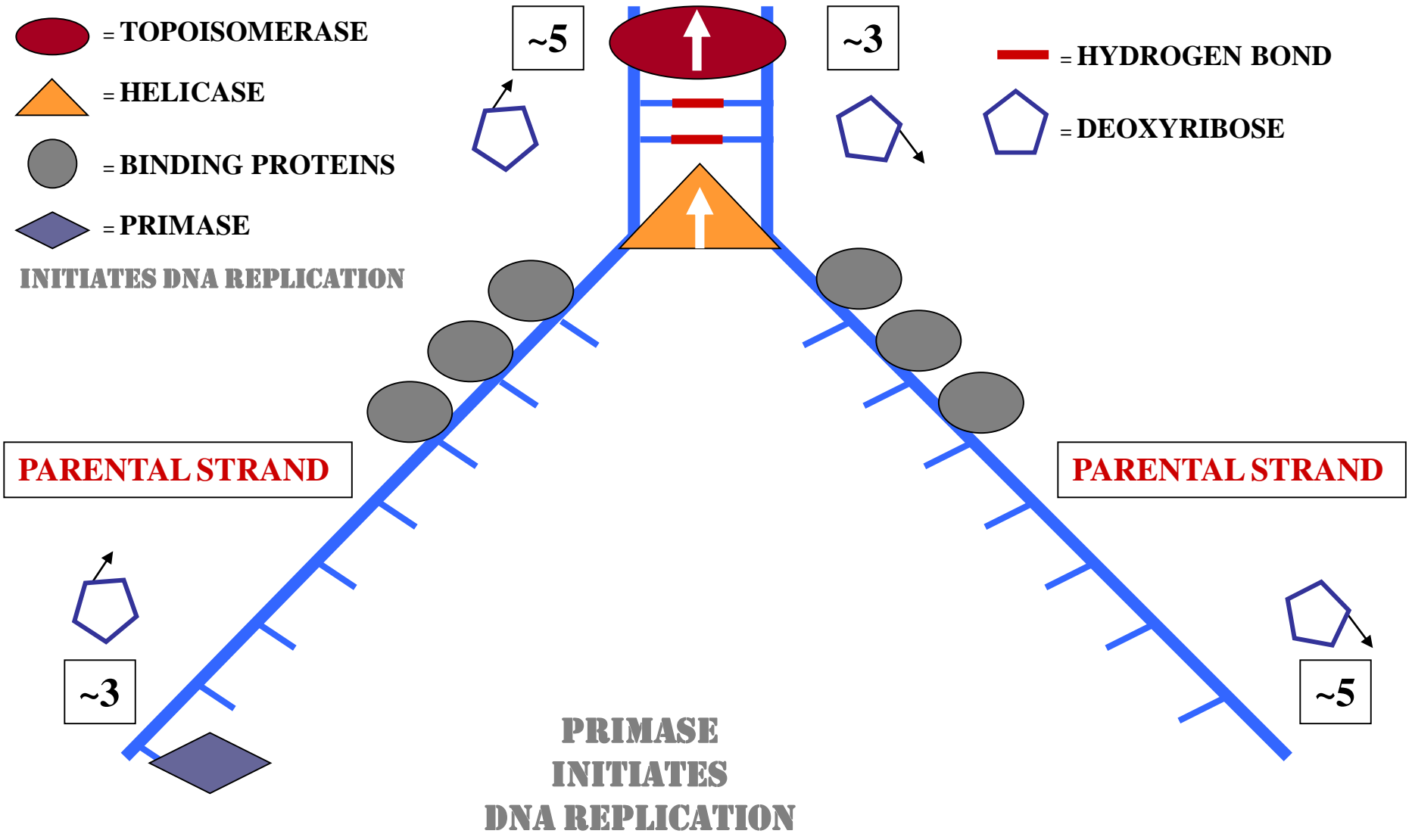
 = BINDING PROTEINS

 = PRIMASE

INITIATES DNA REPLICATION

 = HYDROGEN BOND

 = DEOXYRIBOSE



**DNA
POLYMERASES**



DNA POLYMERASES

**REPLICATE
COMPANION STRAND**

DNA POLYMERASES

REPLICATION - SPECIFICS



 = TOPOISOMERASE

 = HELICASE

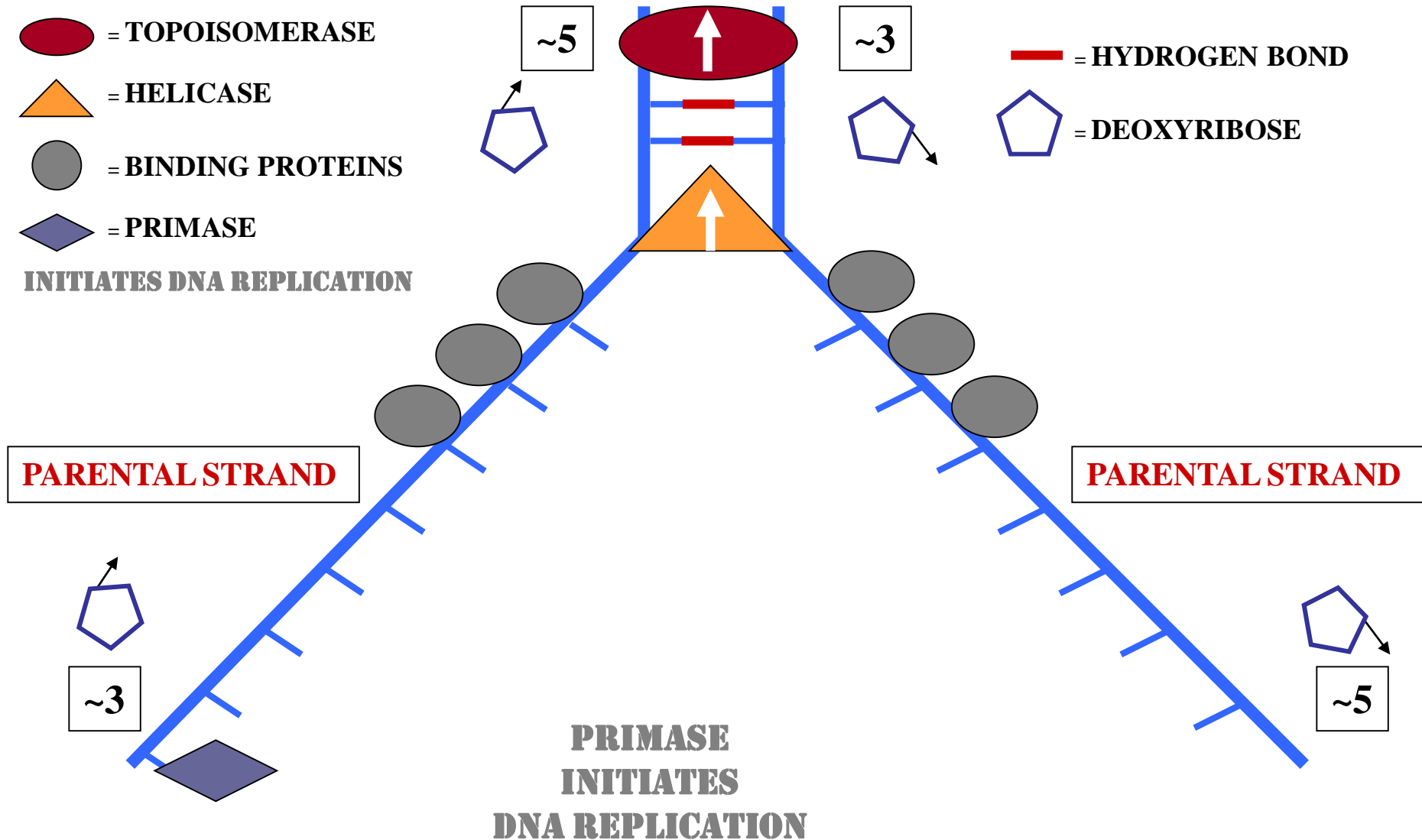
 = BINDING PROTEINS

 = PRIMASE

INITIATES DNA REPLICATION

 = HYDROGEN BOND

 = DEOXYRIBOSE



REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

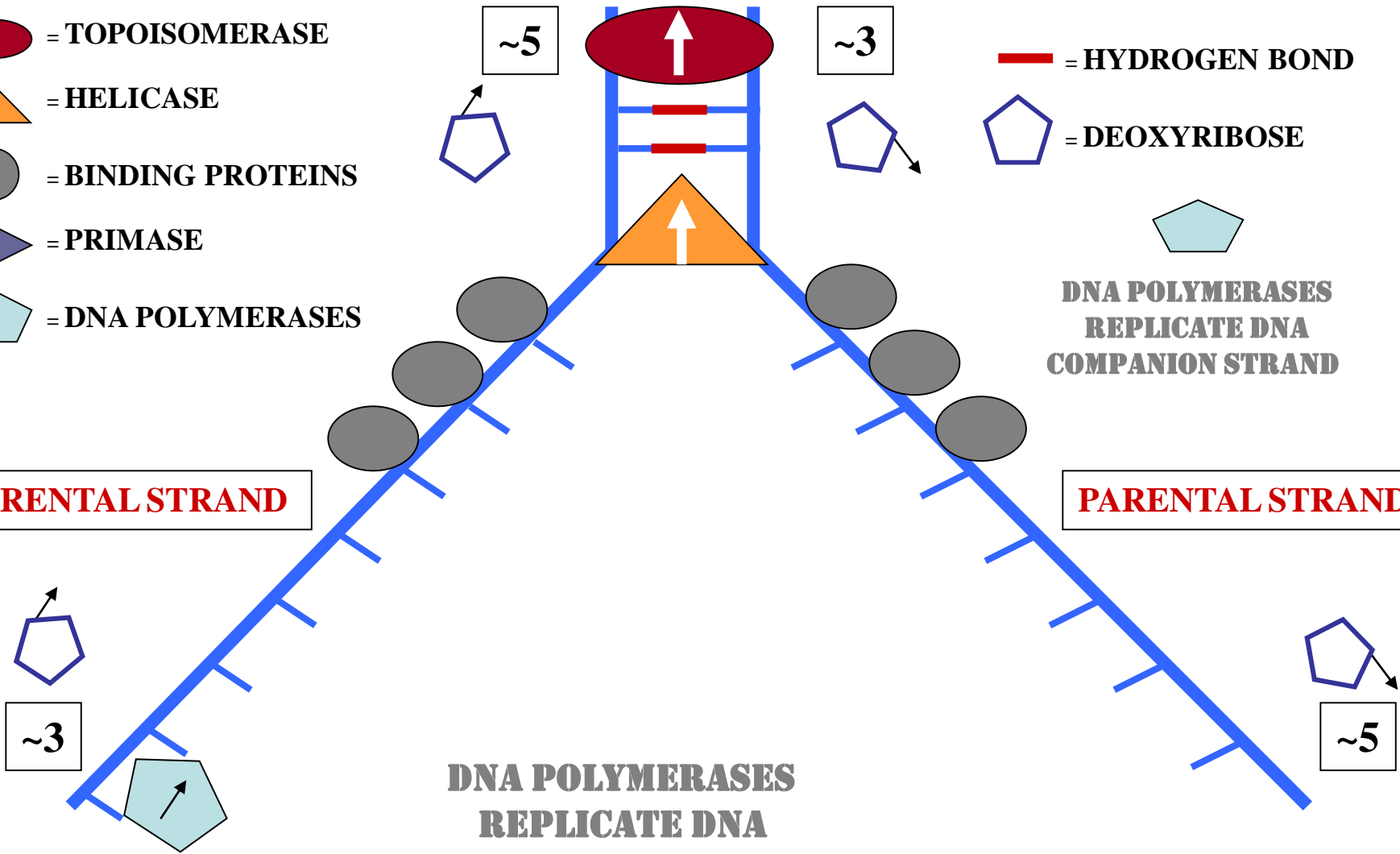
 = DEOXYRIBOSE


DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND

PARENTAL STRAND

PARENTAL STRAND

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND**





DNA POLYMERASES

REPLICATE






COMPANION STRAND



~5 → ~3

ALIGNMENT ONLY

DNA POLYMERASES

REPLICATION - SPECIFICS

-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

-  = HYDROGEN BOND
-  = DEOXYRIBOSE

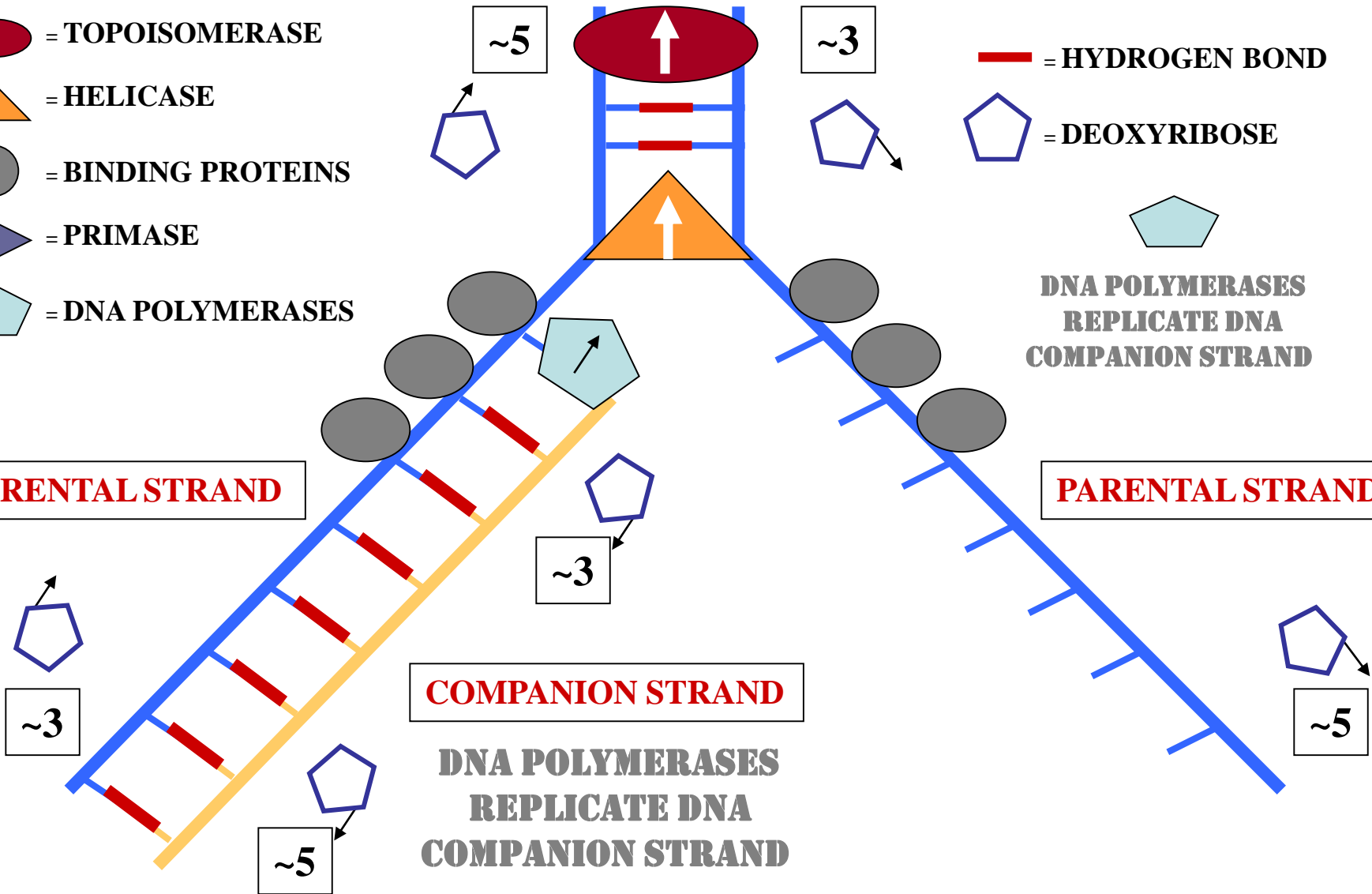
**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND**

PARENTAL STRAND

PARENTAL STRAND

COMPANION STRAND

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND**



REPLICATION - SPECIFICS



- = TOPOISOMERASE
- = HELICASE
- = BINDING PROTEINS
- = PRIMASE
- = DNA POLYMERASES

= HYDROGEN BOND

= DEOXYRIBOSE

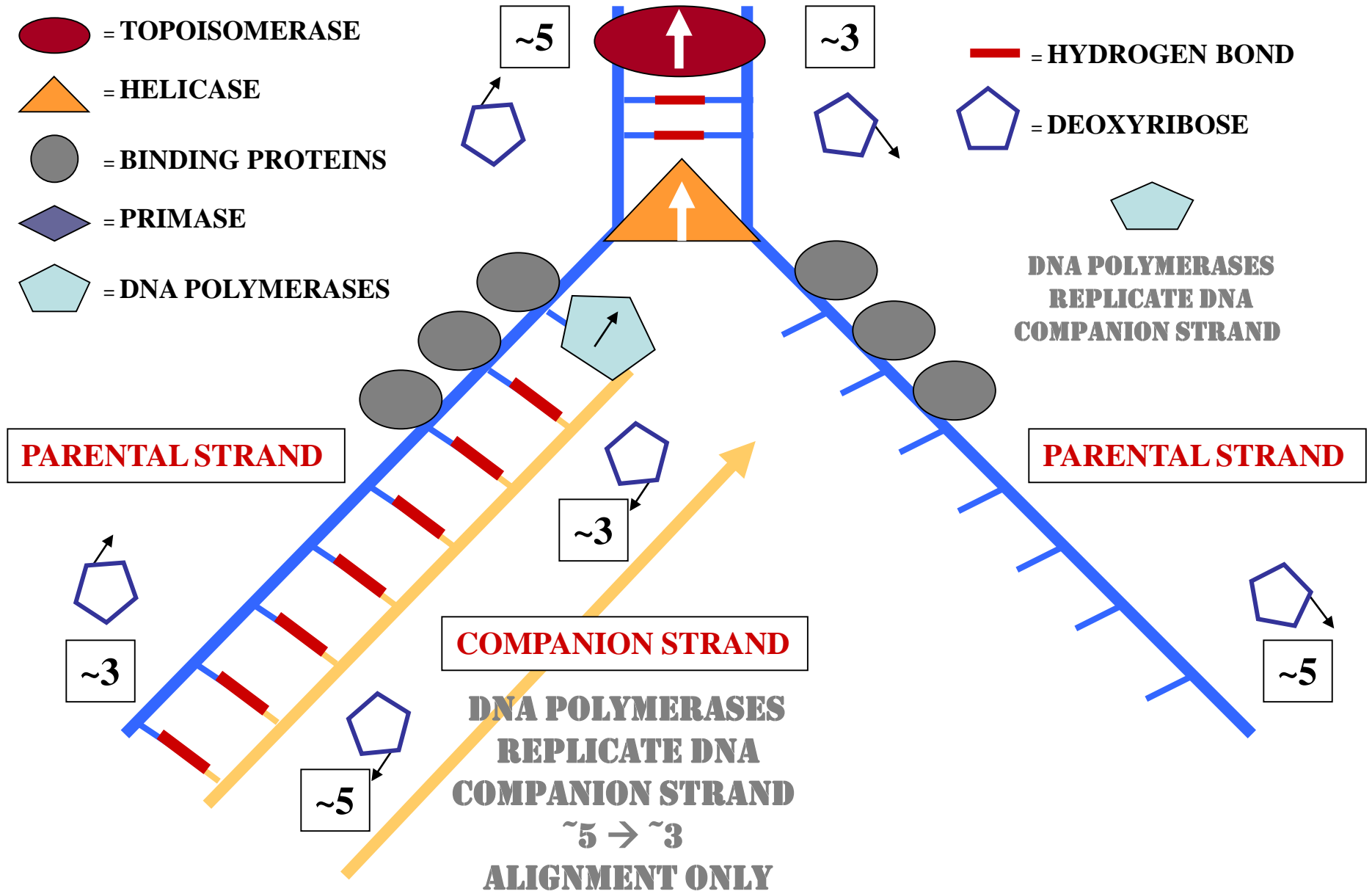
**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND**

PARENTAL STRAND

PARENTAL STRAND

COMPANION STRAND

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**



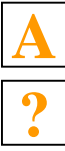
DNA POLYMERASES

REPLICATE
COMPANION STRAND

USE PAR-STRAND
AS NT-BASE GUIDE

DNA POLYMERASES

REPLICATION - SPECIFICS



 = TOPOISOMERASE

 = HELICASE

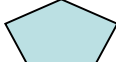
 = BINDING PROTEINS

 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE

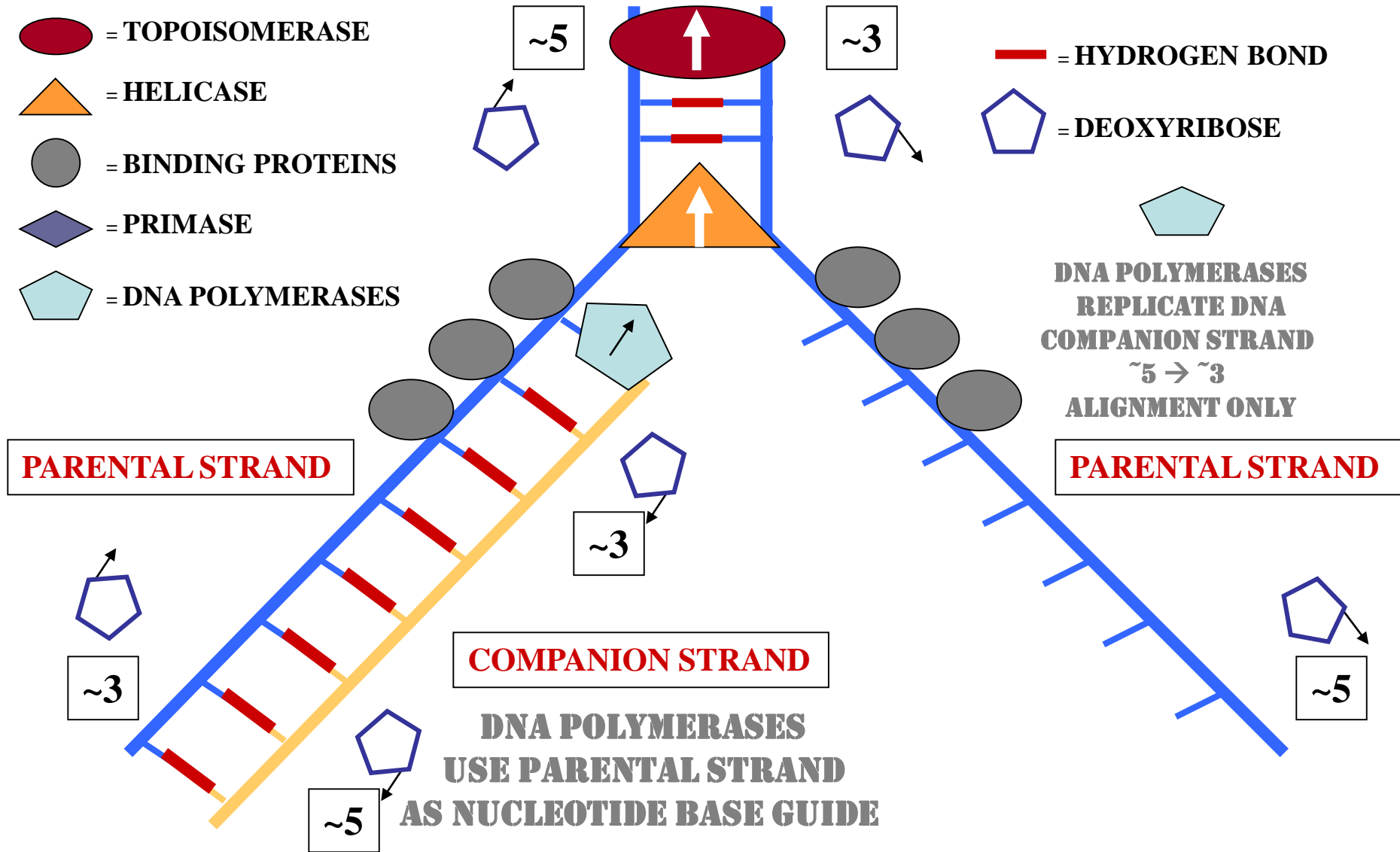

DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY

PARENTAL STRAND

PARENTAL STRAND

COMPANION STRAND

DNA POLYMERASES
USE PARENTAL STRAND
AS NUCLEOTIDE BASE GUIDE



REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE

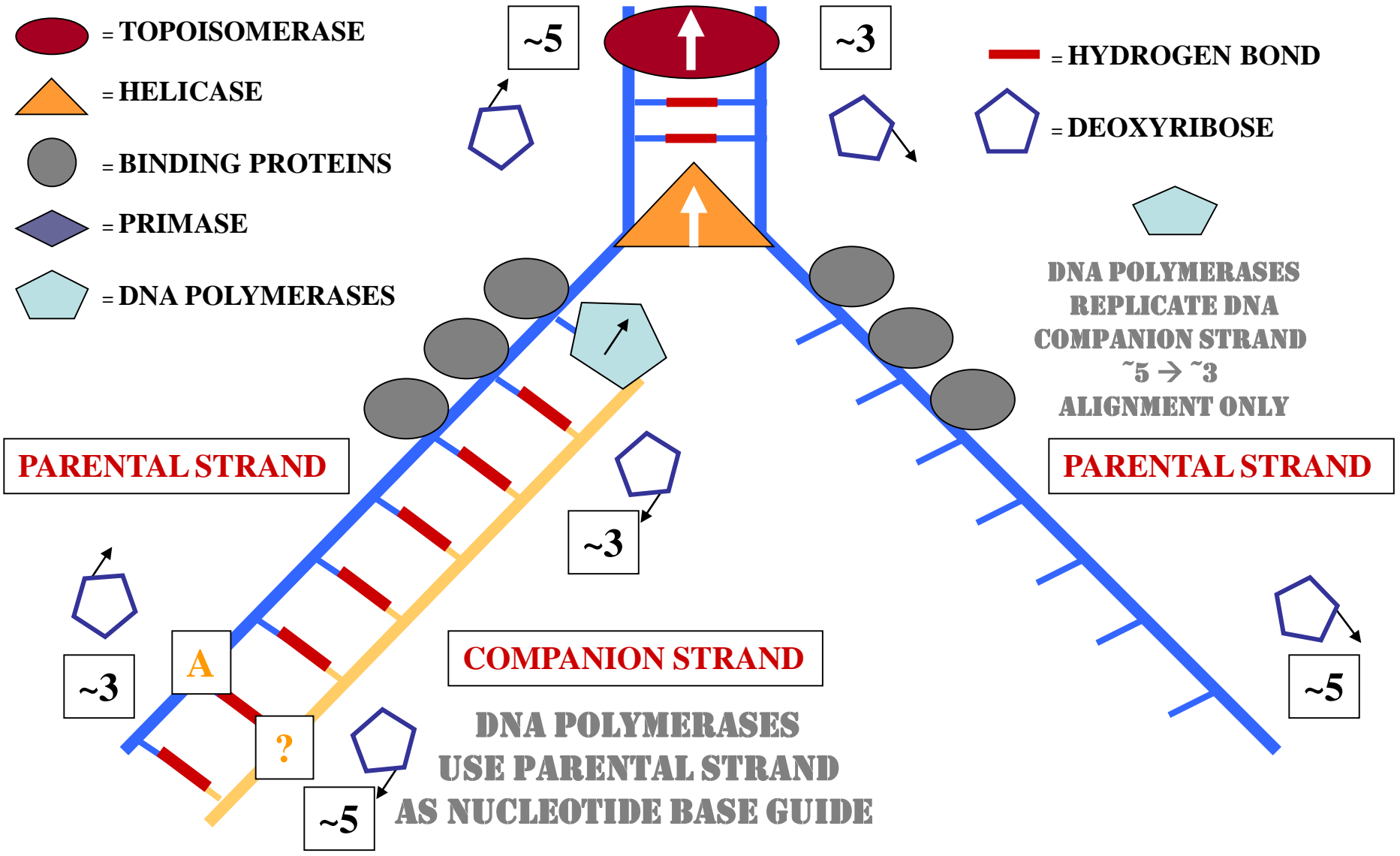
**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**

PARENTAL STRAND

PARENTAL STRAND






COMPANION STRAND



**DNA POLYMERASES
USE PARENTAL STRAND
AS NUCLEOTIDE BASE GUIDE**

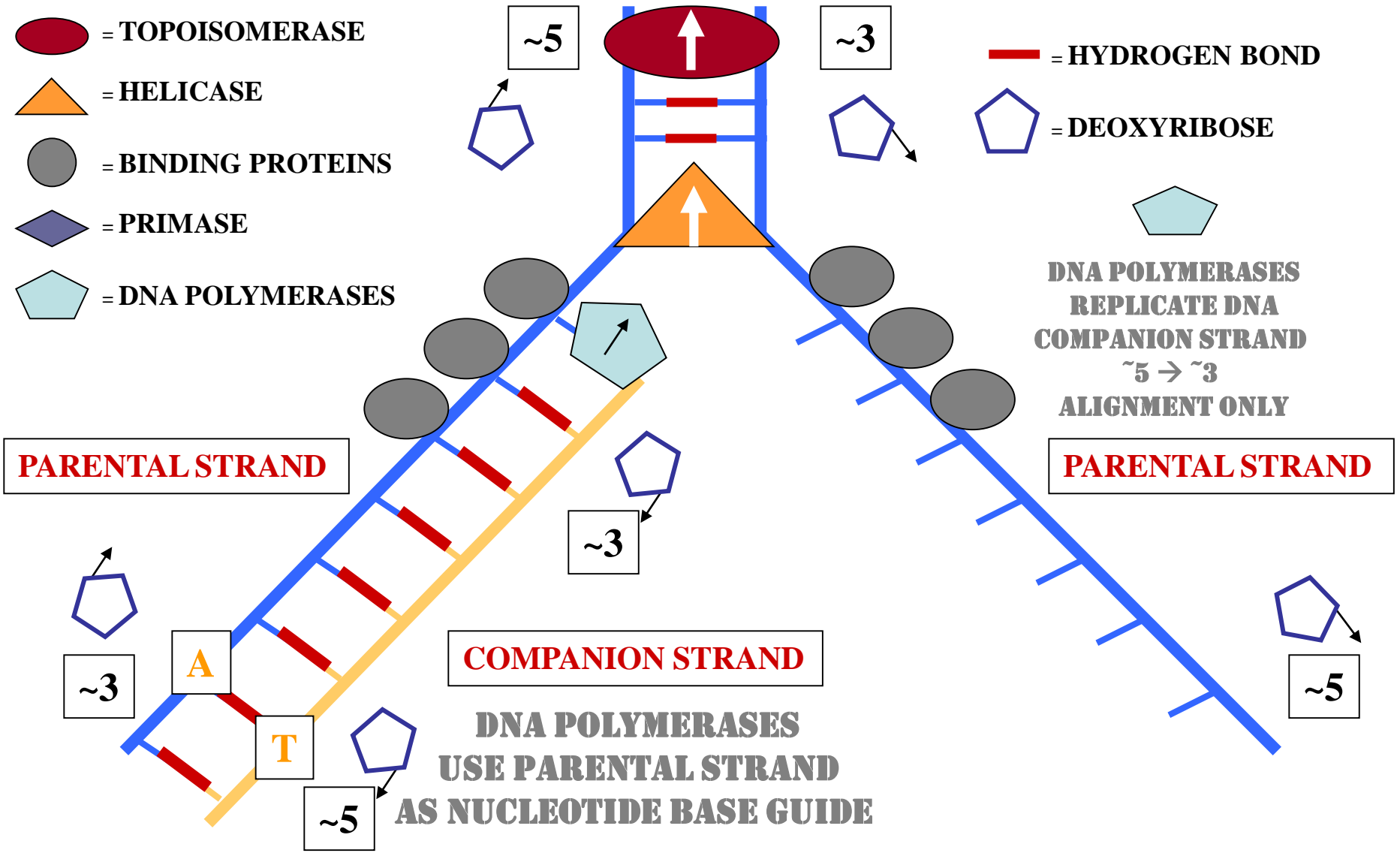


REPLICATION - SPECIFICS

G
?

-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

-  = HYDROGEN BOND
-  = DEOXYRIBOSE



**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**

**DNA POLYMERASES
USE PARENTAL STRAND
AS NUCLEOTIDE BASE GUIDE**

PARENTAL STRAND

PARENTAL STRAND

COMPANION STRAND

A

T

~3

~5





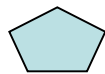
~3



~5

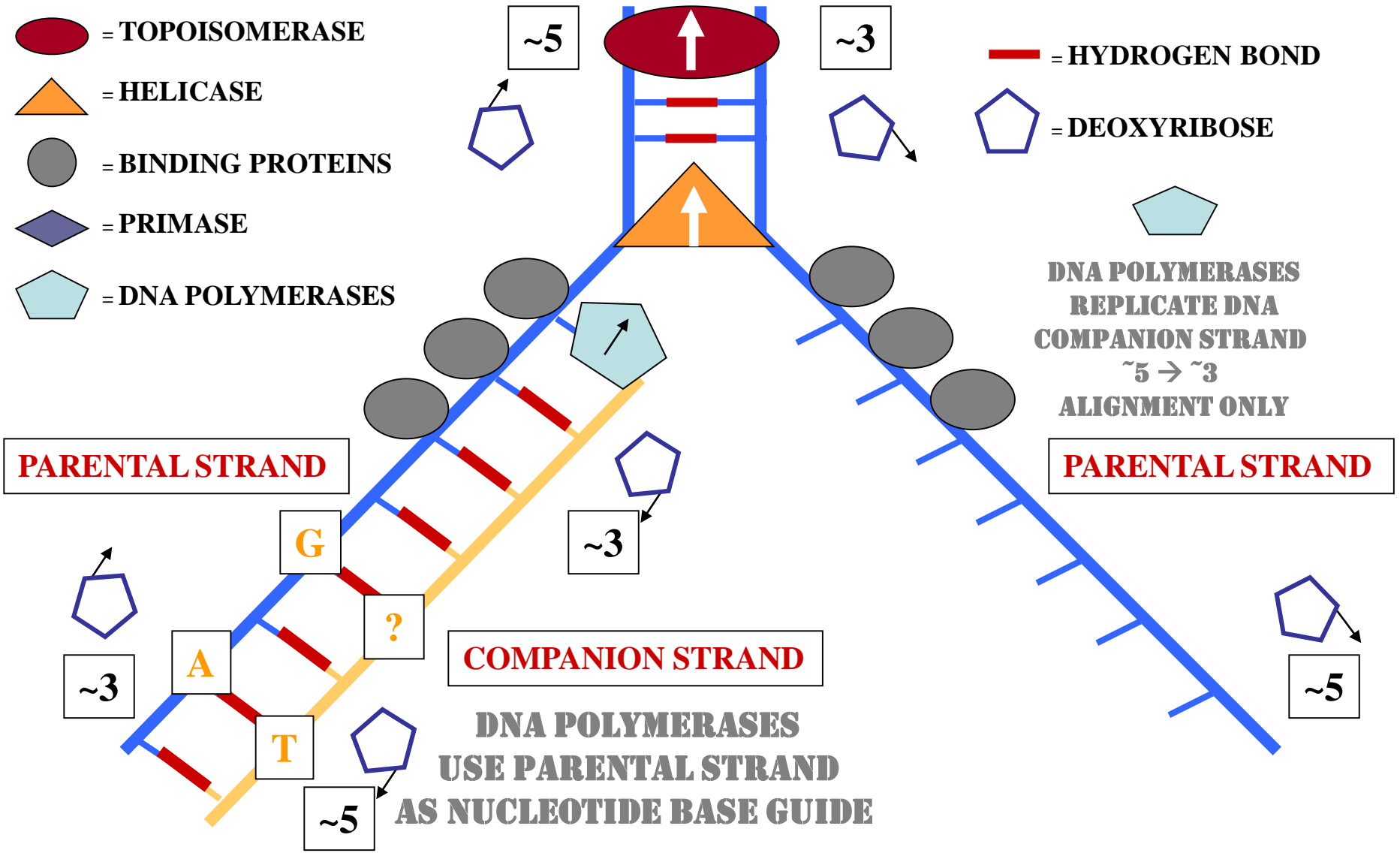
~3

~5

REPLICATION - SPECIFICS

-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

-  = HYDROGEN BOND
-  = DEOXYRIBOSE



**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**

**DNA POLYMERASES
USE PARENTAL STRAND
AS NUCLEOTIDE BASE GUIDE**

REPLICATION - SPECIFICS

T
?

 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE

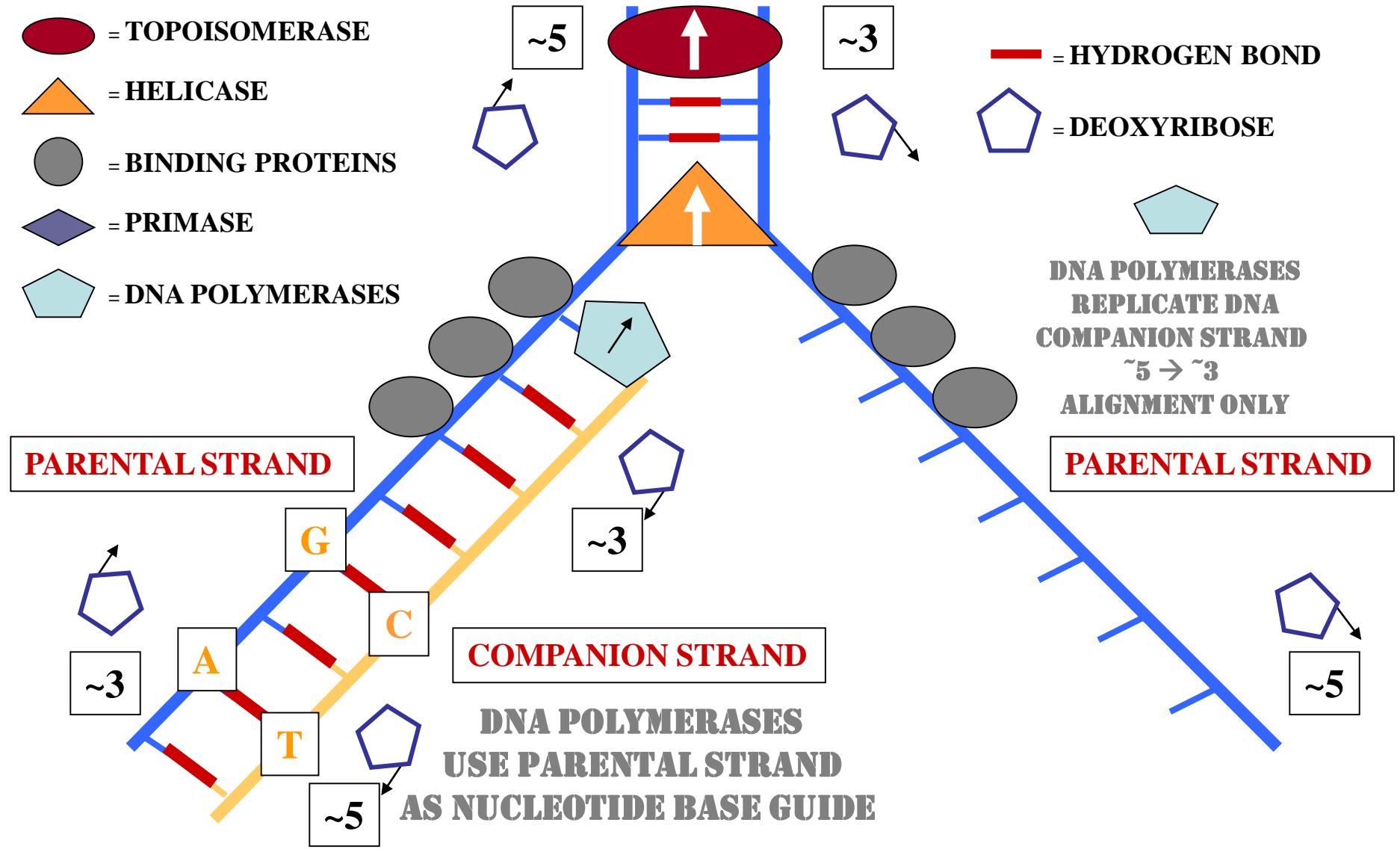
**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**

PARENTAL STRAND

PARENTAL STRAND

COMPANION STRAND

**DNA POLYMERASES
USE PARENTAL STRAND
AS NUCLEOTIDE BASE GUIDE**

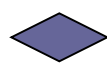


REPLICATION - SPECIFICS

 = TOPOISOMERASE

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 = DNA POLYMERASES

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 = DEOXYRIBOSE

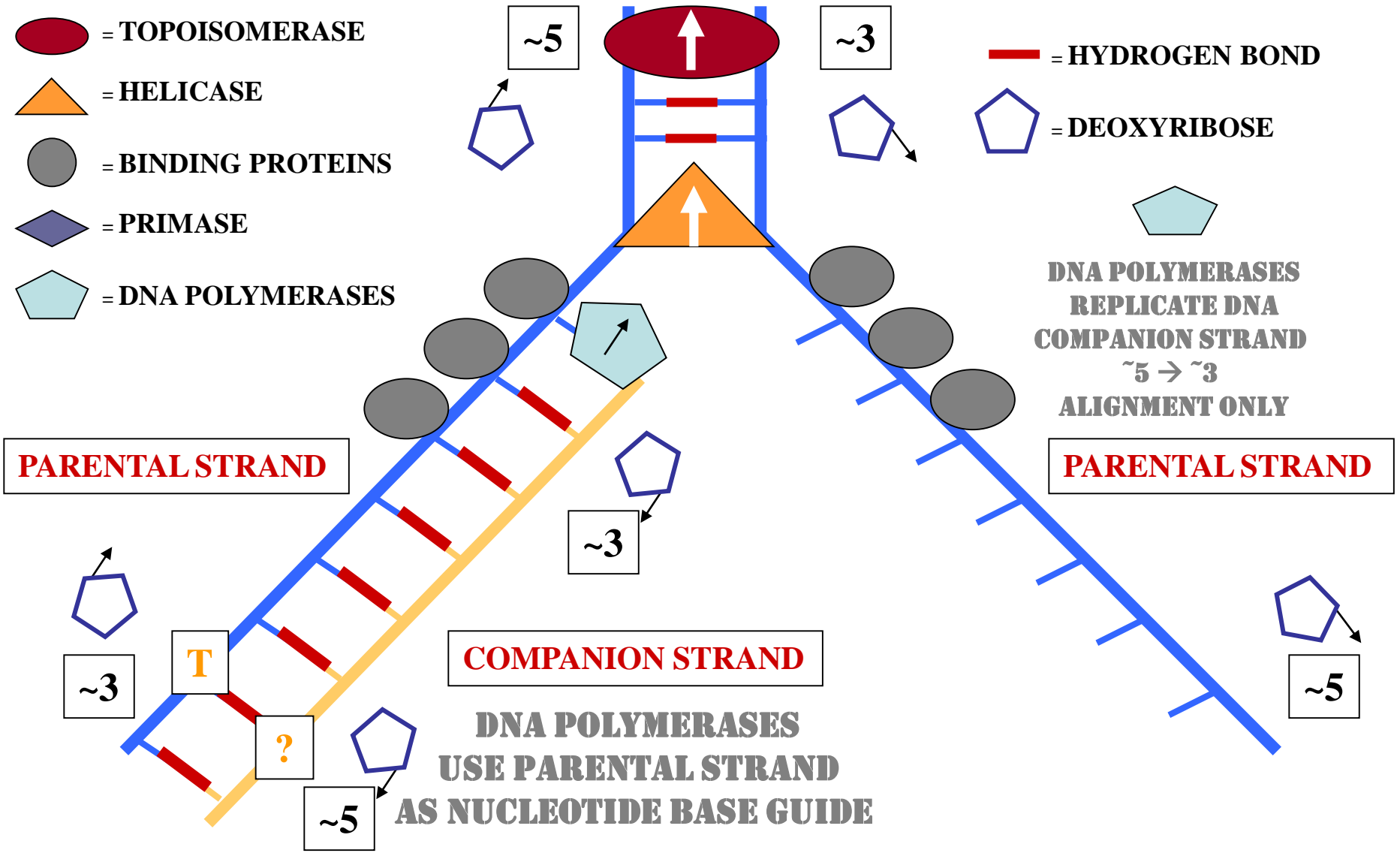
**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**

PARENTAL STRAND

PARENTAL STRAND

COMPANION STRAND

**DNA POLYMERASES
USE PARENTAL STRAND
AS NUCLEOTIDE BASE GUIDE**



~3

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~3

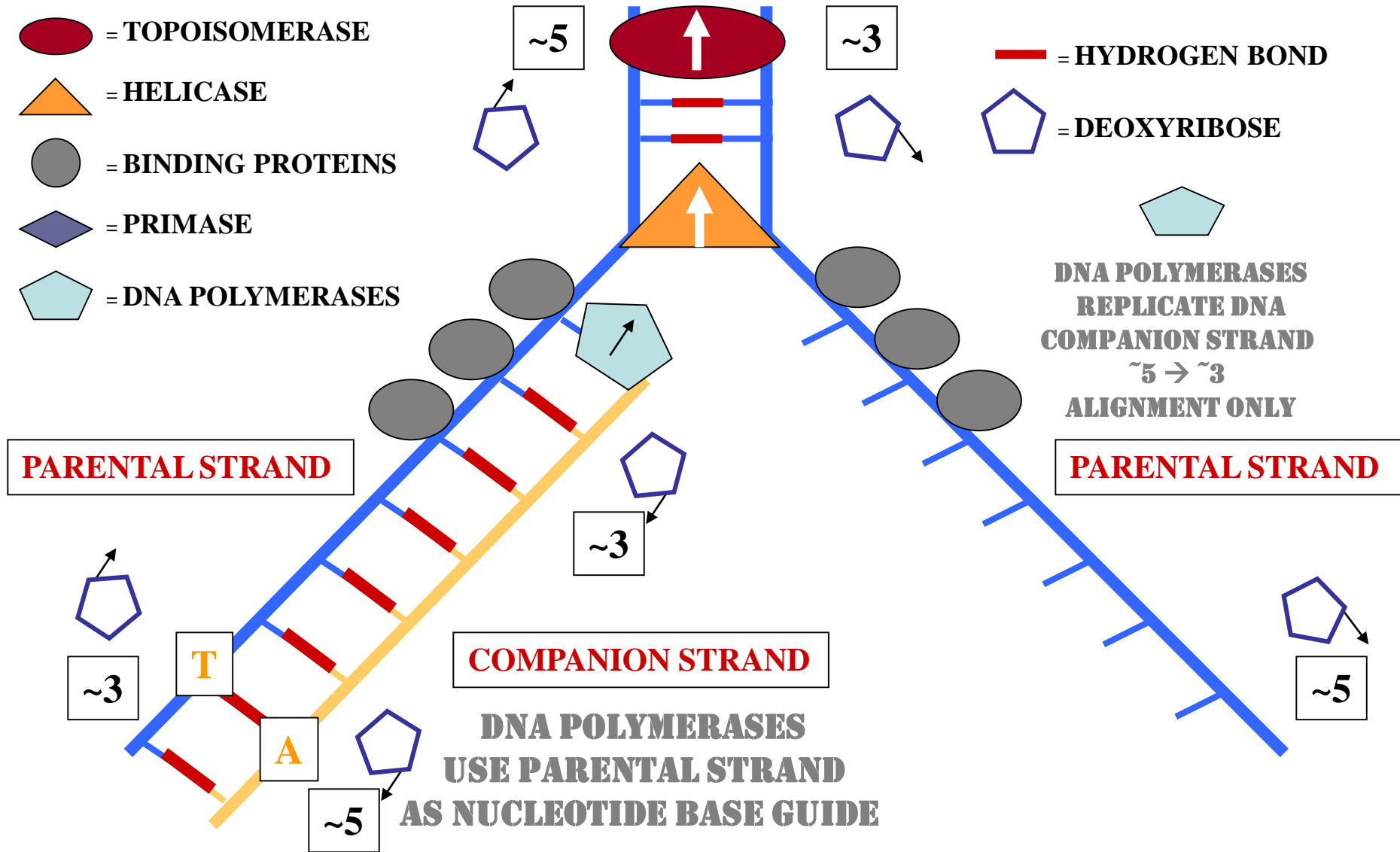
~5

~5

REPLICATION - SPECIFICS

-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

-  = HYDROGEN BOND
-  = DEOXYRIBOSE



**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**

**DNA POLYMERASES
USE PARENTAL STRAND
AS NUCLEOTIDE BASE GUIDE**

PARENTAL STRAND

PARENTAL STRAND

COMPANION STRAND

T

A

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~3

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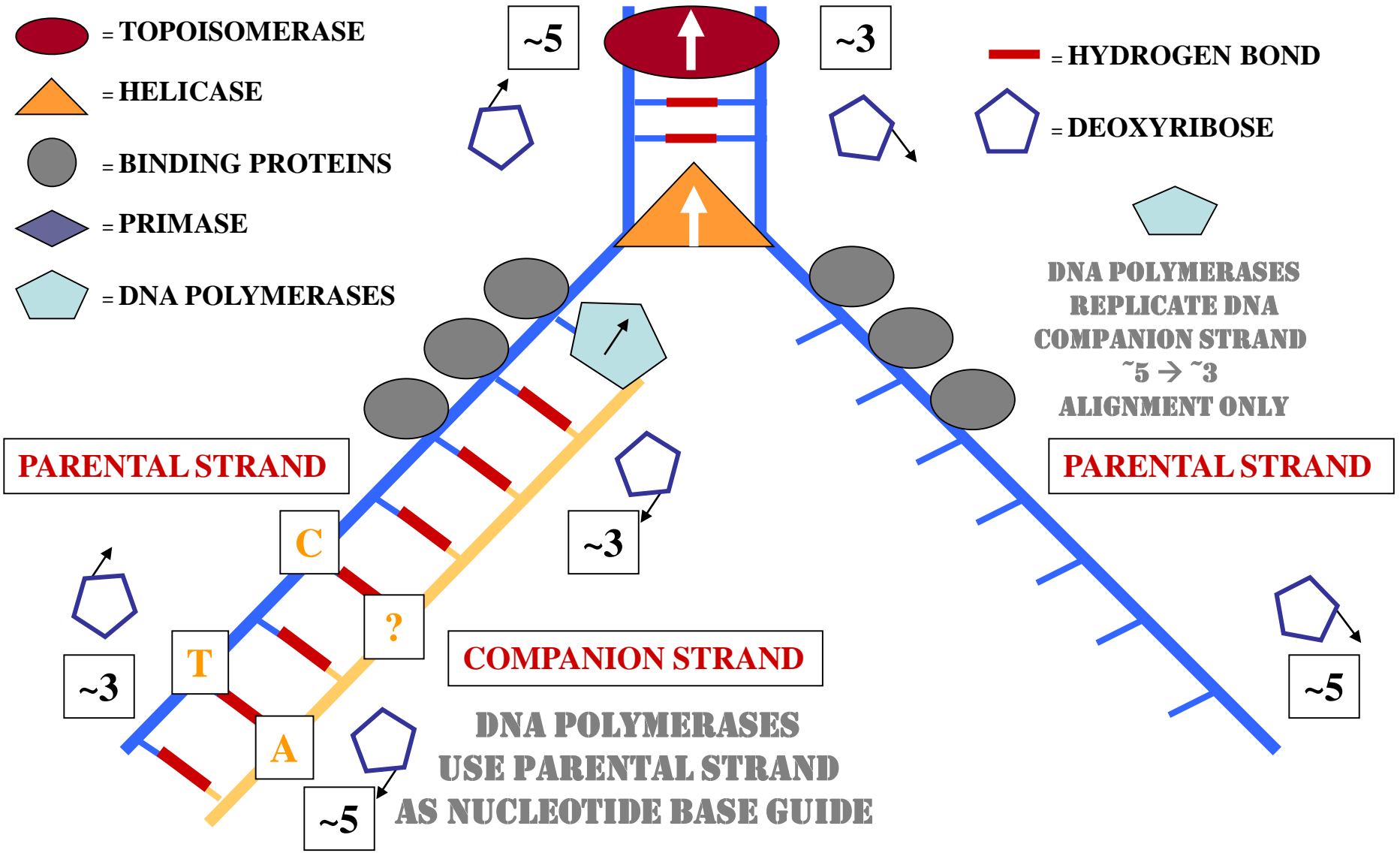
REPLICATION - SPECIFICS

-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**



PARENTAL STRAND

PARENTAL STRAND

COMPANION STRAND

**DNA POLYMERASES
USE PARENTAL STRAND
AS NUCLEOTIDE BASE GUIDE**

C

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~3

~3

~5

~5

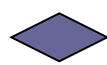


REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

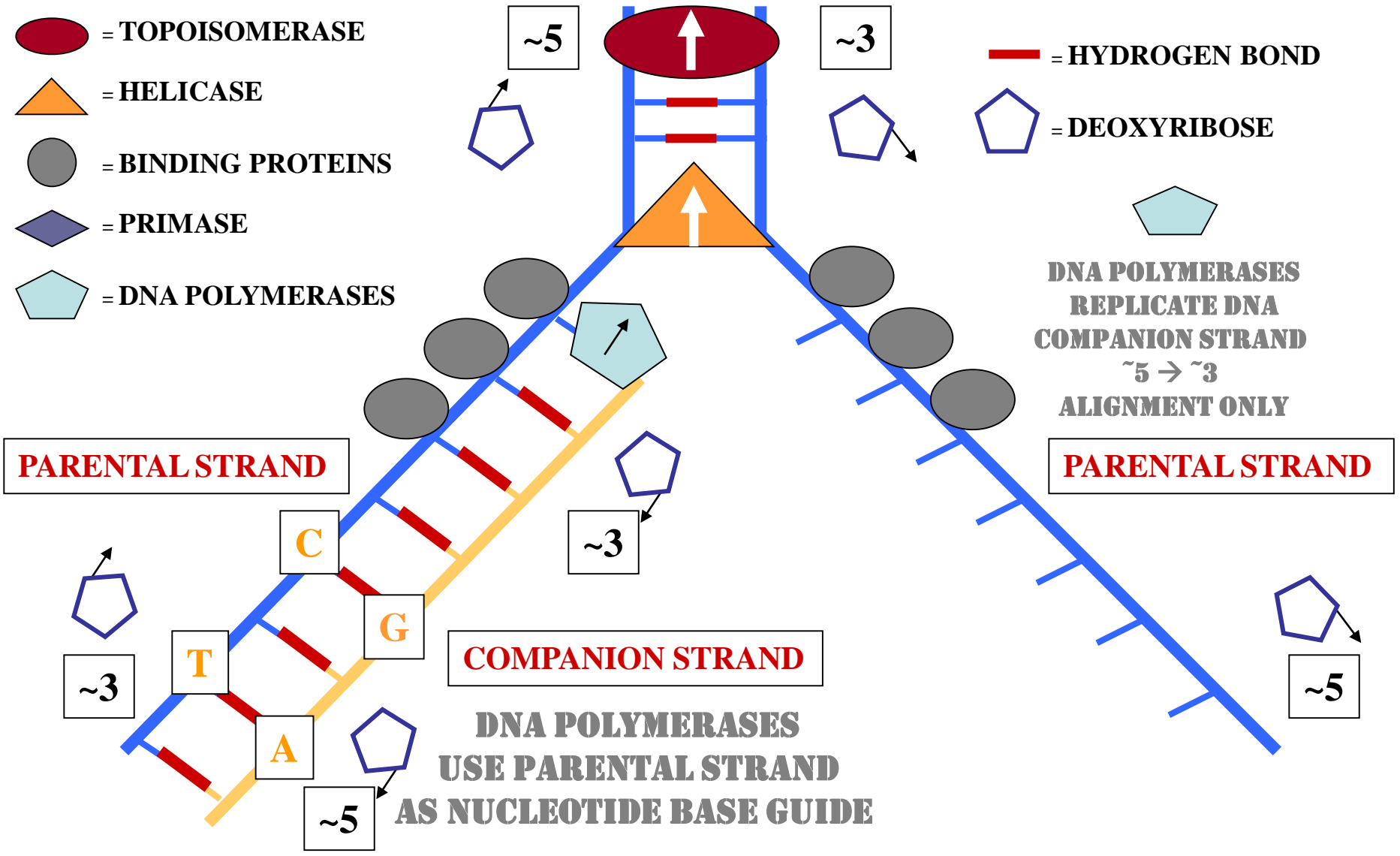
 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**



PARENTAL STRAND

PARENTAL STRAND

COMPANION STRAND

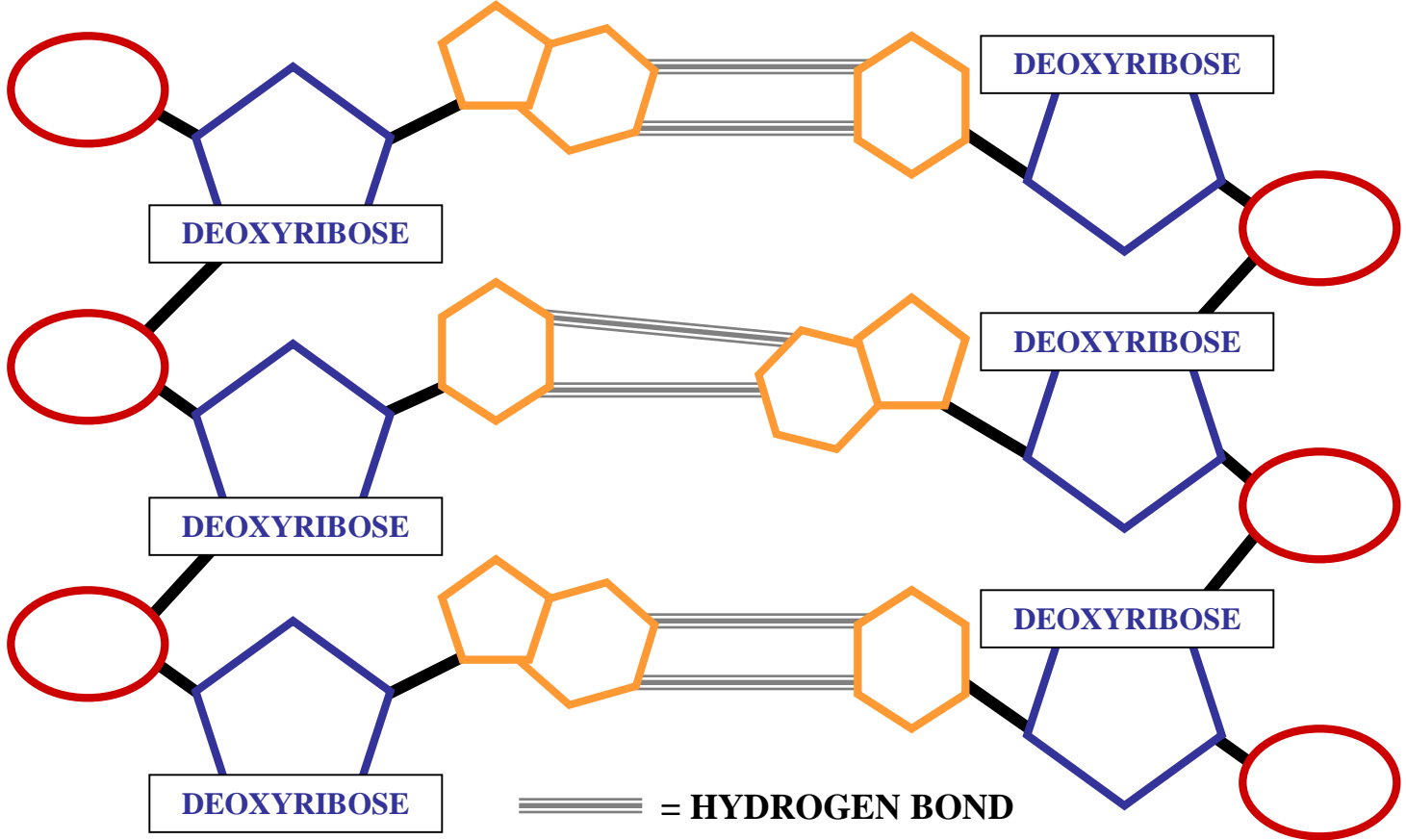
**DNA POLYMERASES
USE PARENTAL STRAND
AS NUCLEOTIDE BASE GUIDE**



PARENTAL STRANDS REPLICATION

SPECIFICS
DIFFER

DNA DOUBLE HELIX MODEL

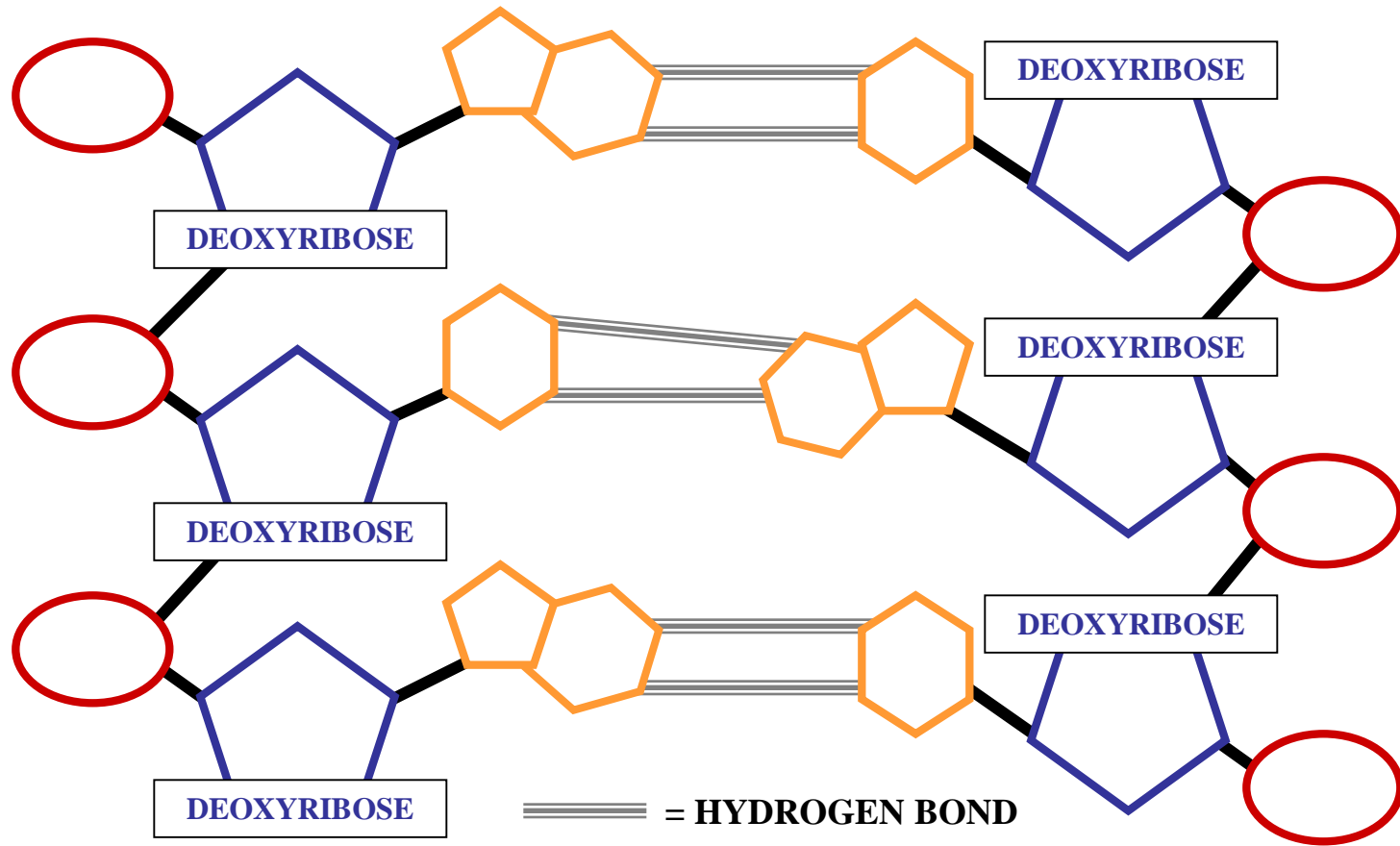


FIRST
PARENTAL
DNA-STRAND

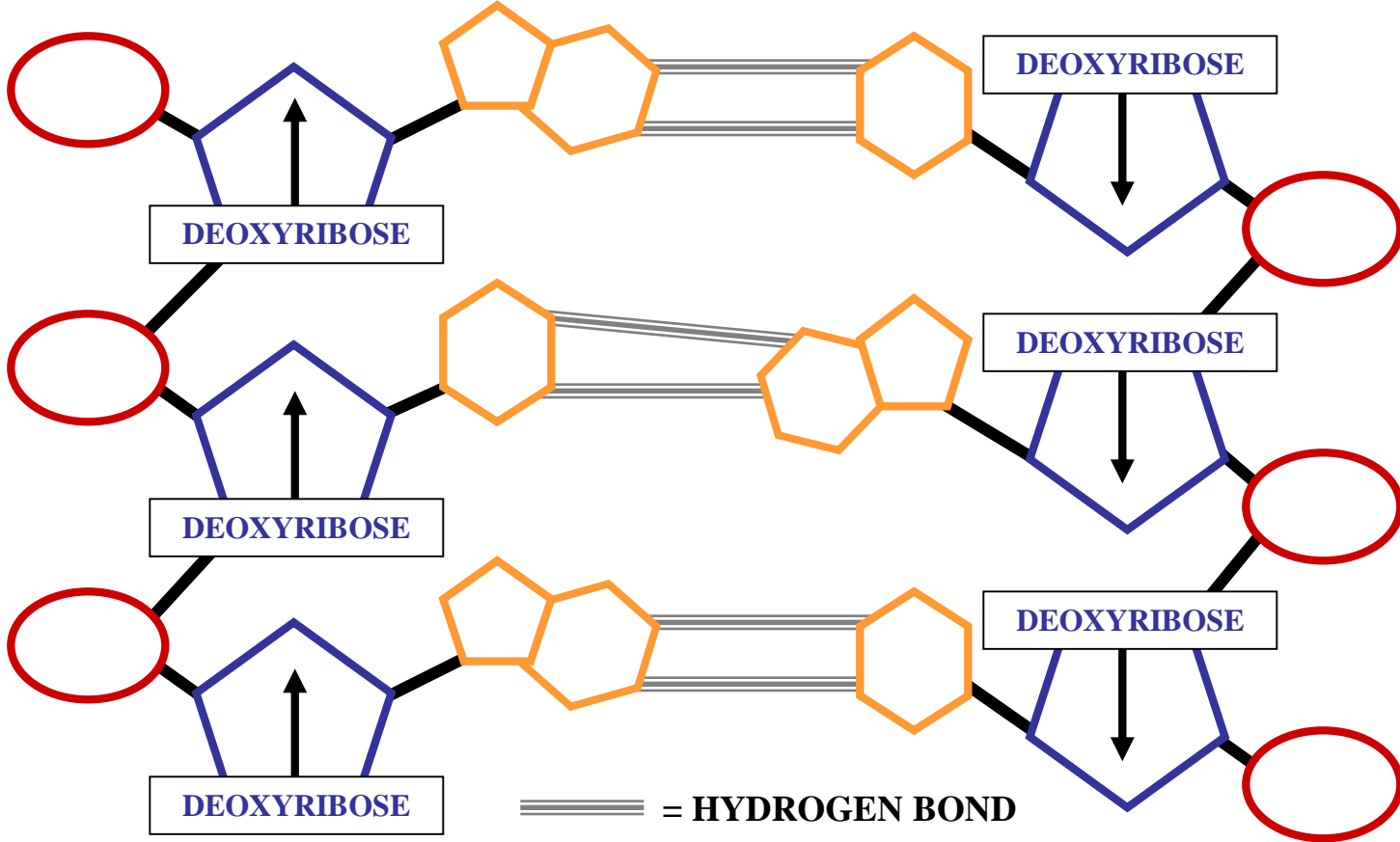
SECOND
PARENTAL
DNA-STRAND

PAR-STRANDS: REPLICATION SPECIFICS DIFFER

DNA DOUBLE HELIX MODEL

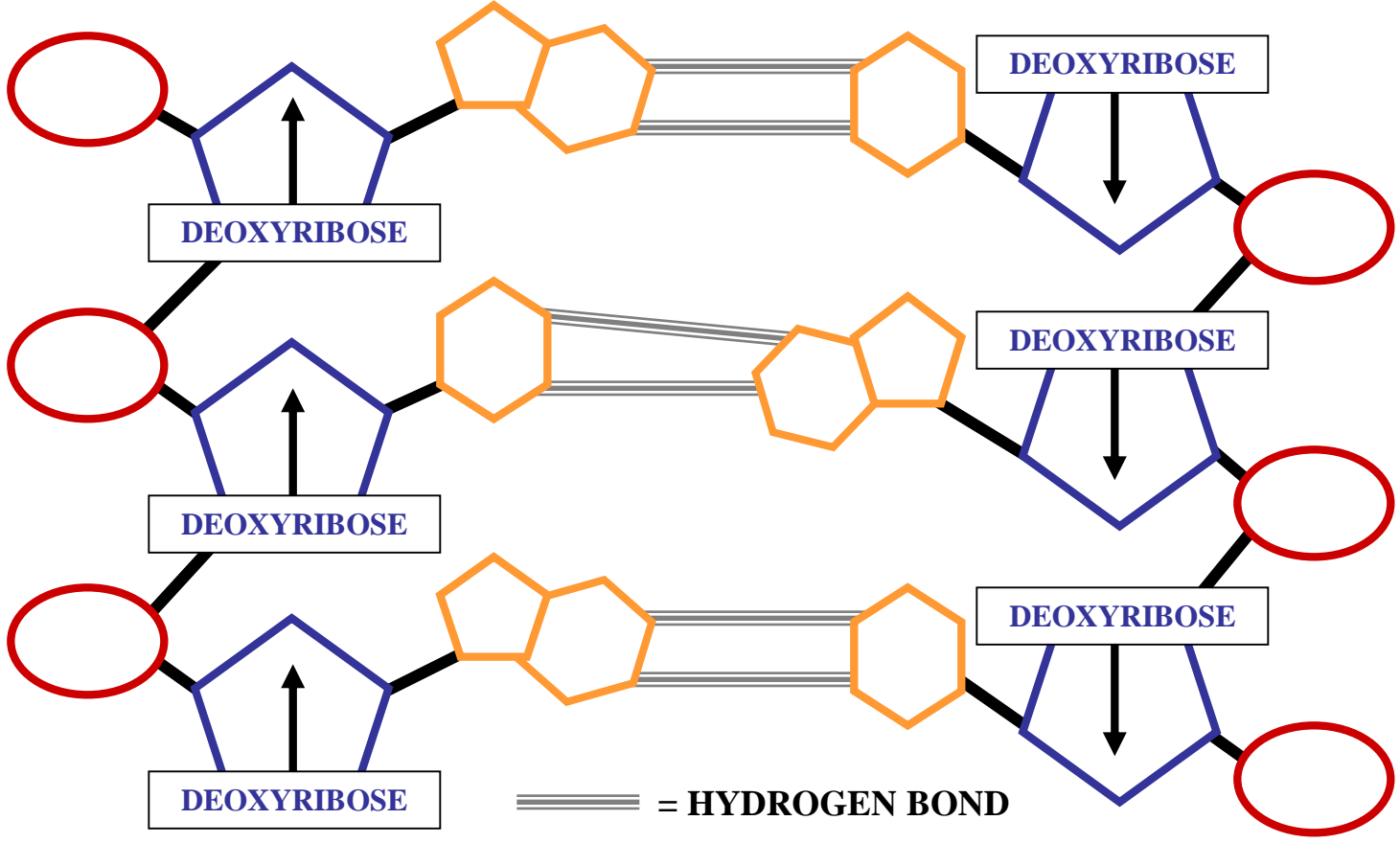


**ARE THE DEOXYRIBOSE SUGARS
POINTED IN THE SAME OR
OPPOSITE ALIGNMENTS?**



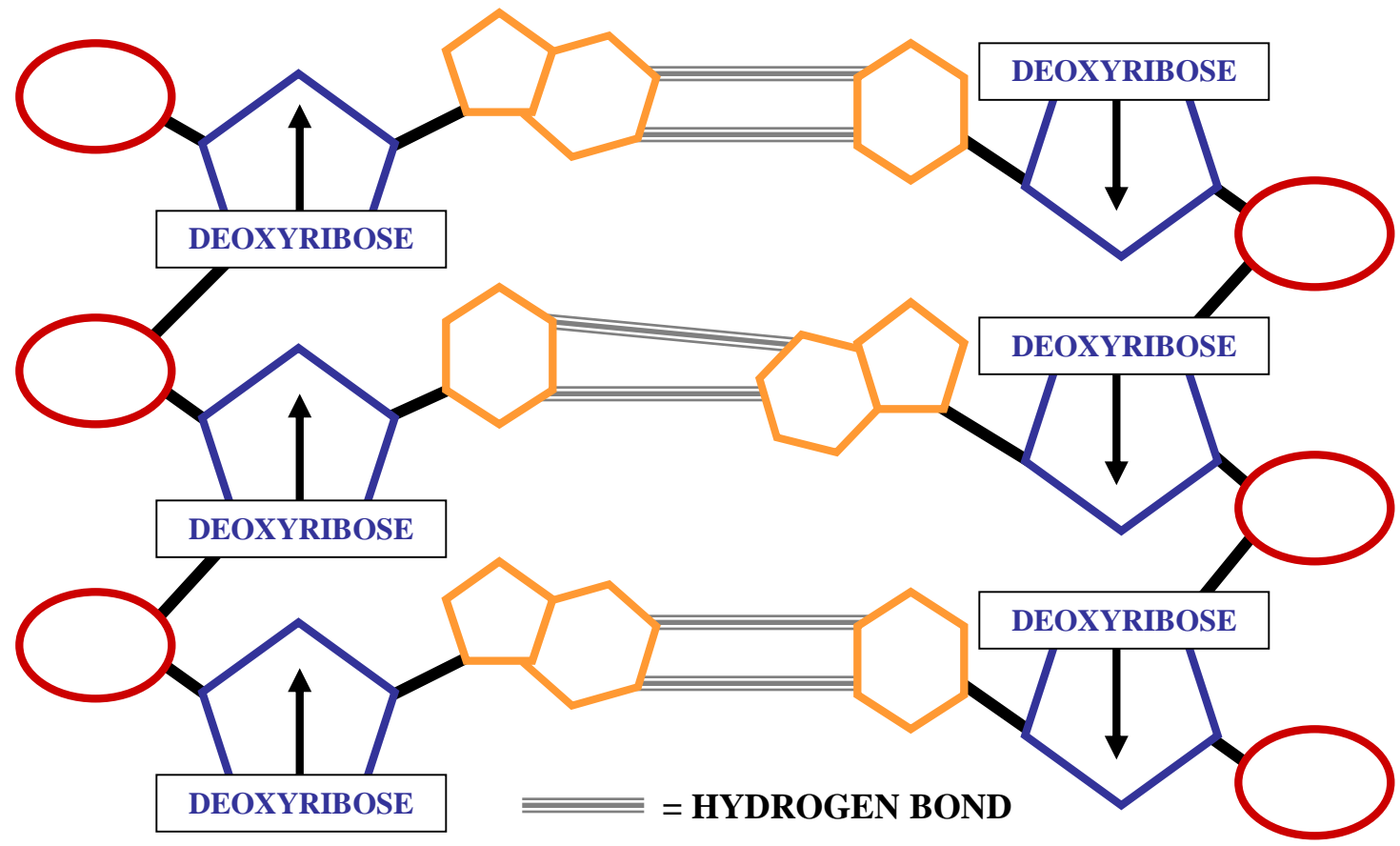
**THE DEOXYRIBOSE SUGARS
ARE POINTED
OPPOSITE ALIGNMENTS**

DNA DOUBLE HELIX MODEL

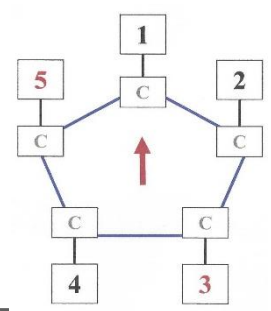


**FIRST
PARENTAL
DNA STRAND**

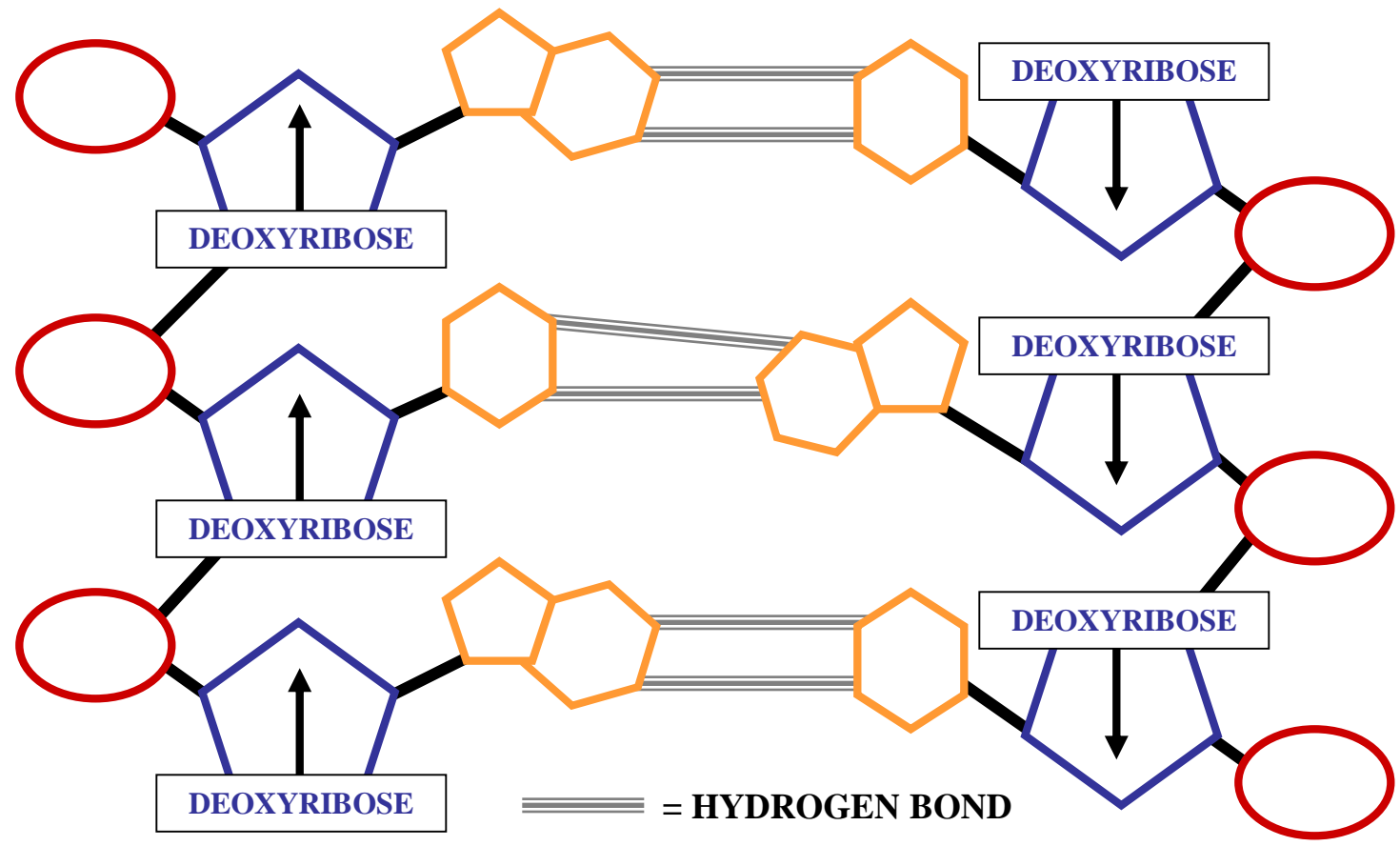
DNA DOUBLE HELIX MODEL



FIRST
PARENTAL
DNA STRAND
DEOXYRIBOSE
~3~5 C ALIGNMENT



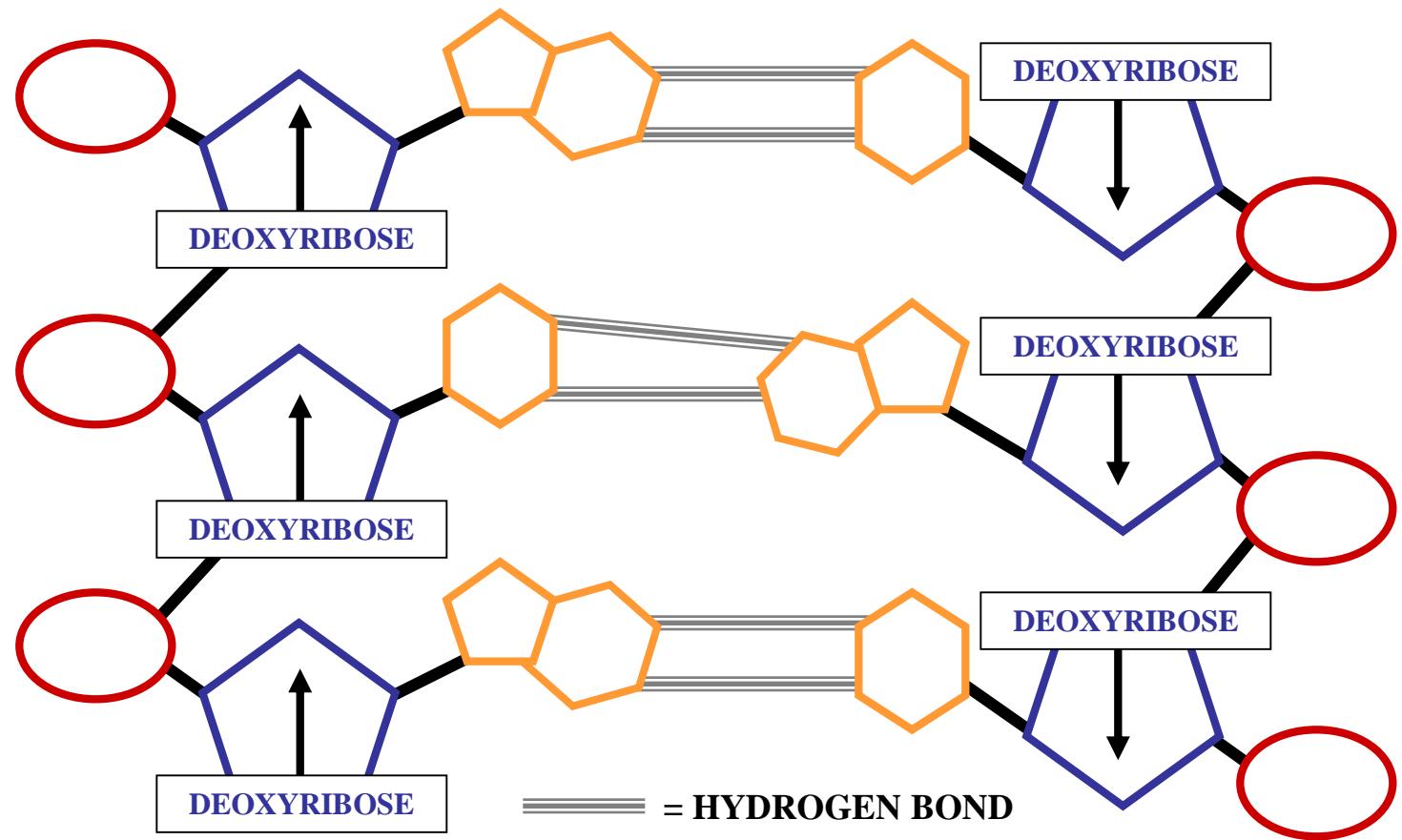
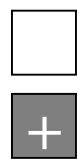
DNA DOUBLE HELIX MODEL



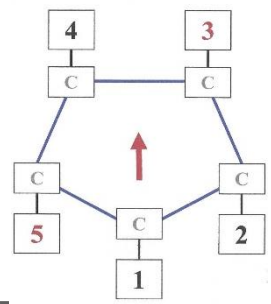
FIRST
PARENTAL
DNA STRAND
DEOXYRIBOSE
~3~5 C ALIGNMENT

SECOND
PARENTAL
DNA STRAND

DNA DOUBLE HELIX MODEL

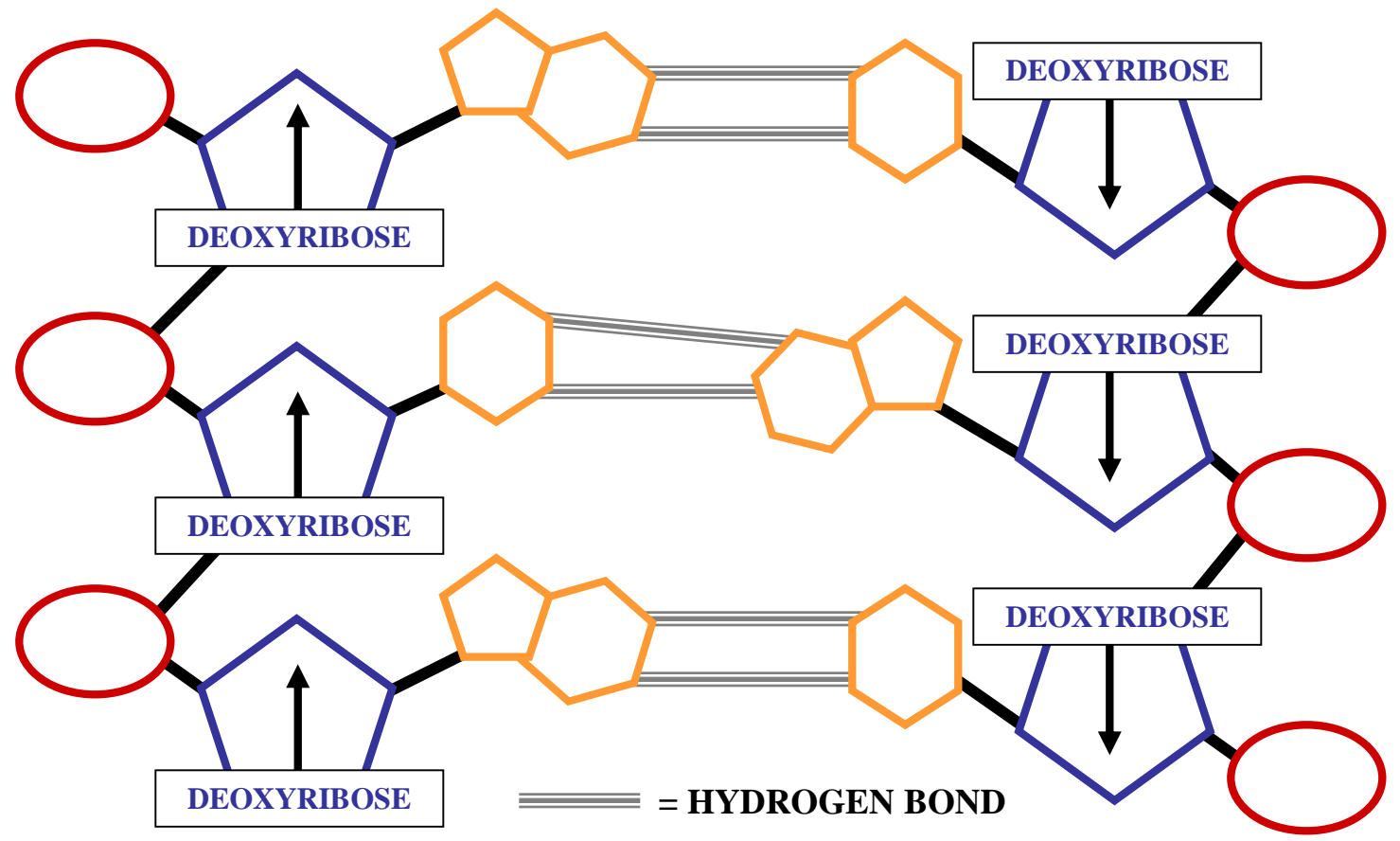


**FIRST
PARENTAL
DNA STRAND
DEOXYRIBOSE**
~3~5 C ALIGNMENT



**SECOND
PARENTAL
DNA STRAND
DEOXYRIBOSE**
~5~3 C ALIGNMENT

DNA DOUBLE HELIX MODEL



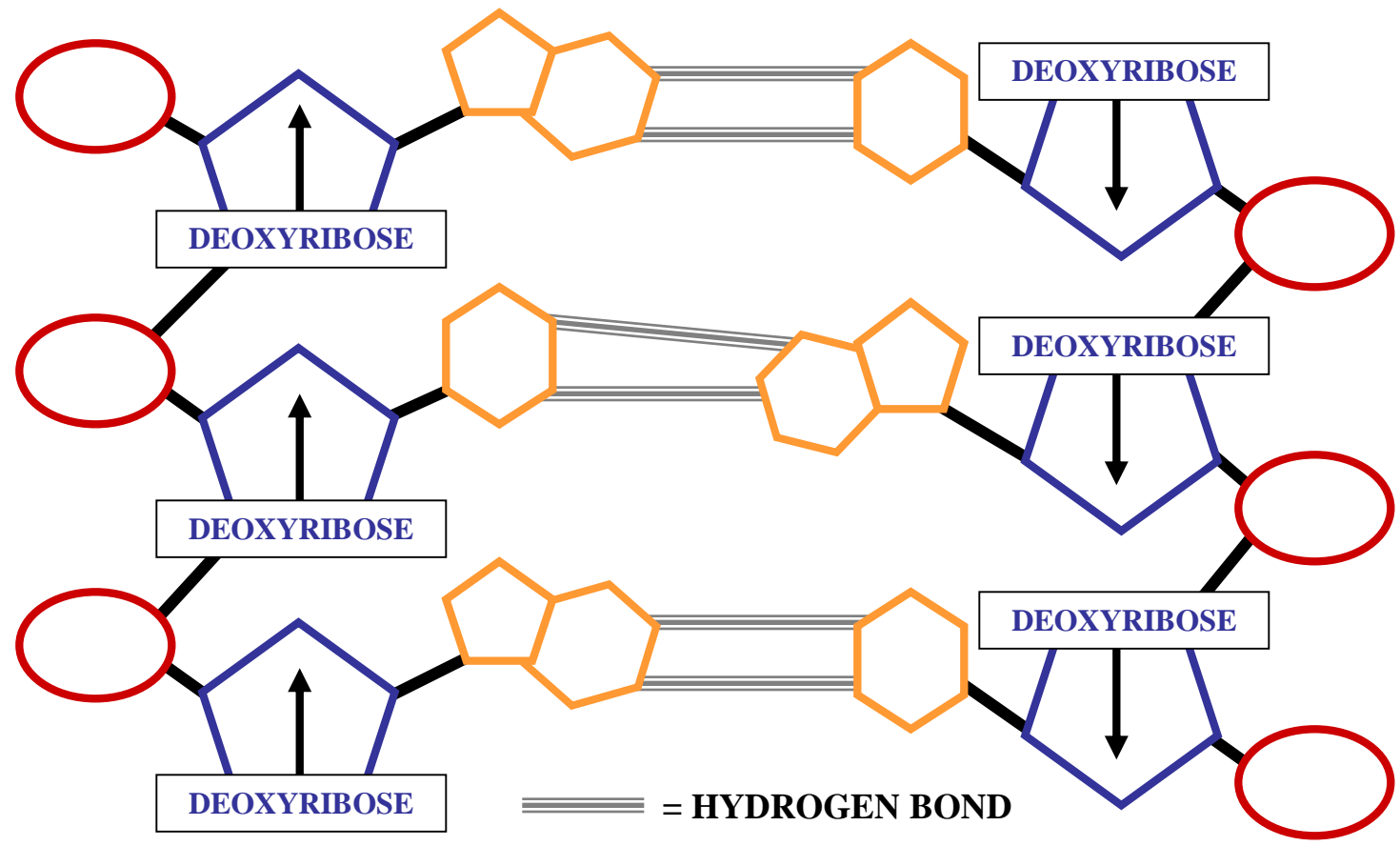
**FIRST
PARENTAL
DNA STRAND
DEOXYRIBOSE
~3~5 C ALIGNMENT**

**SECOND
PARENTAL
DNA STRAND
DEOXYRIBOSE
~5~3 C ALIGNMENT**

DNA DOUBLE HELIX MODEL



PARENTAL DNA-STRANDS
PARALLEL

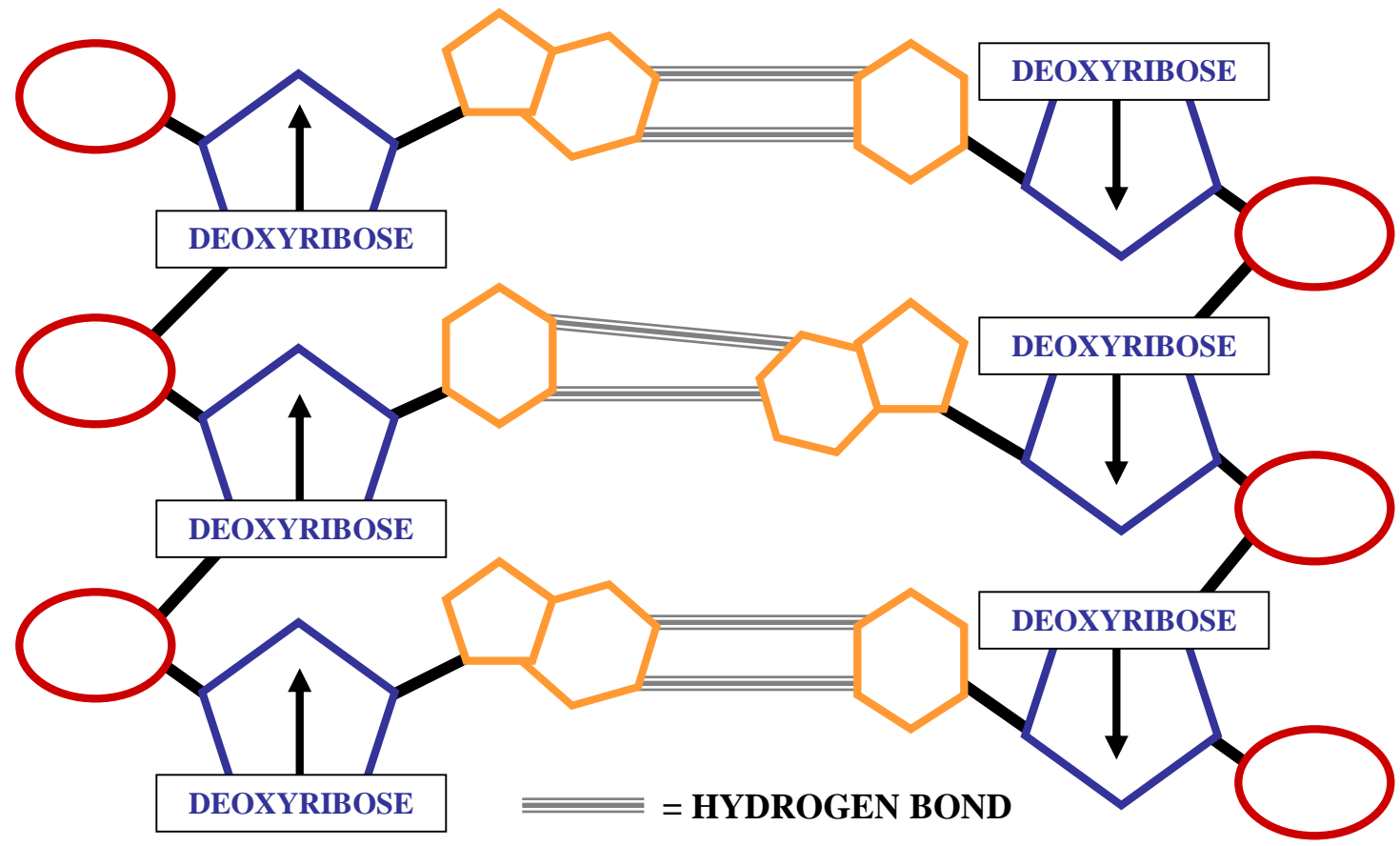


PARENTAL DNA-STRANDS
PARALLEL

**PARENTAL DNA-STRANDS
PARALLEL**

DNA DOUBLE HELIX MODEL

PARENTAL DNA-STRANDS
ANTIPARALLEL



PARENTAL DNA-STRANDS
ANTIPARALLEL

**PARENTAL DNA-STRANDS
ANTIPARALLEL**



REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

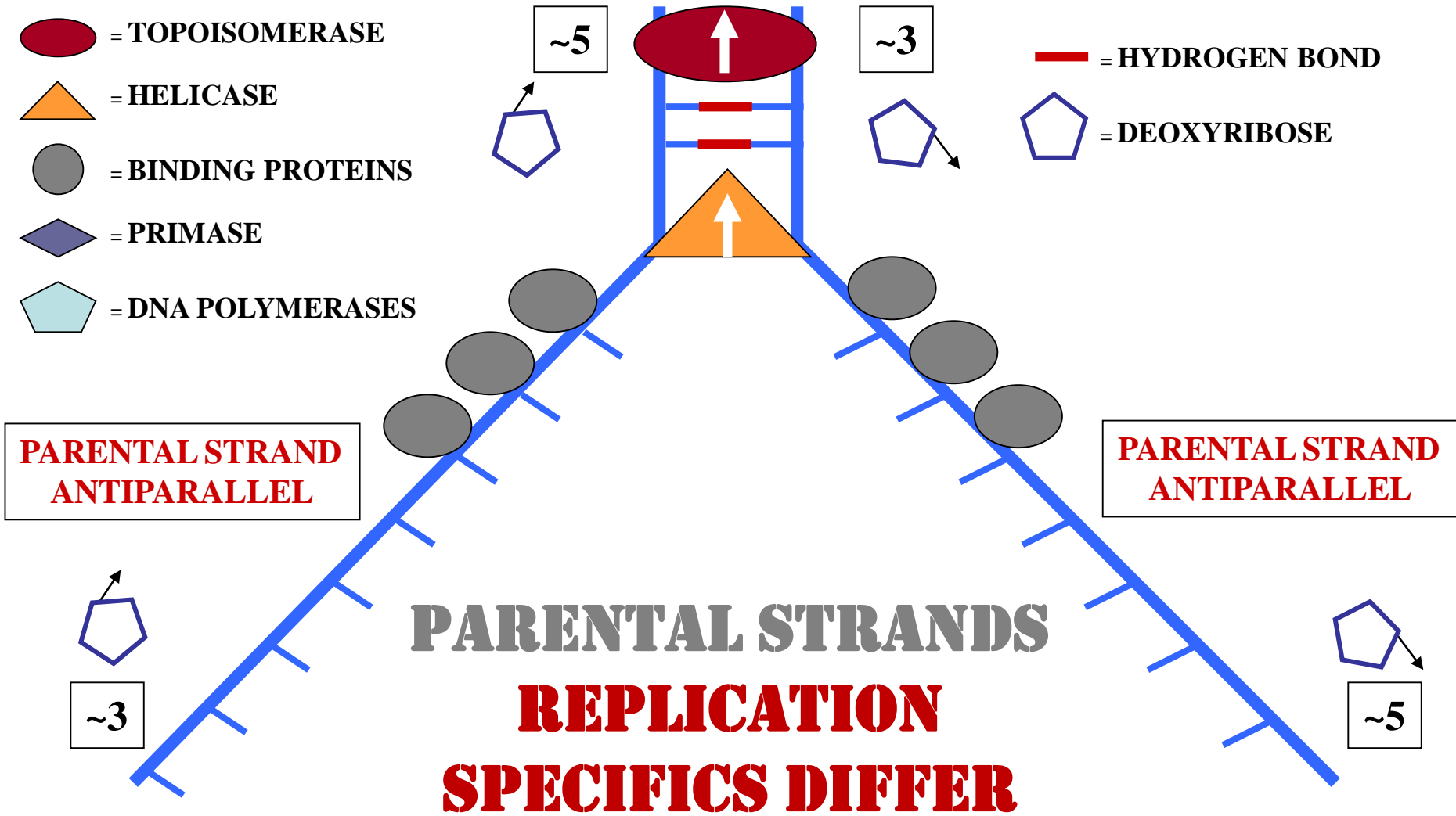
 = BINDING PROTEINS

 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE





PARENTAL STRANDS REPLICATION SPECIFICS

~3 → ~5

PARENTAL STRAND

REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

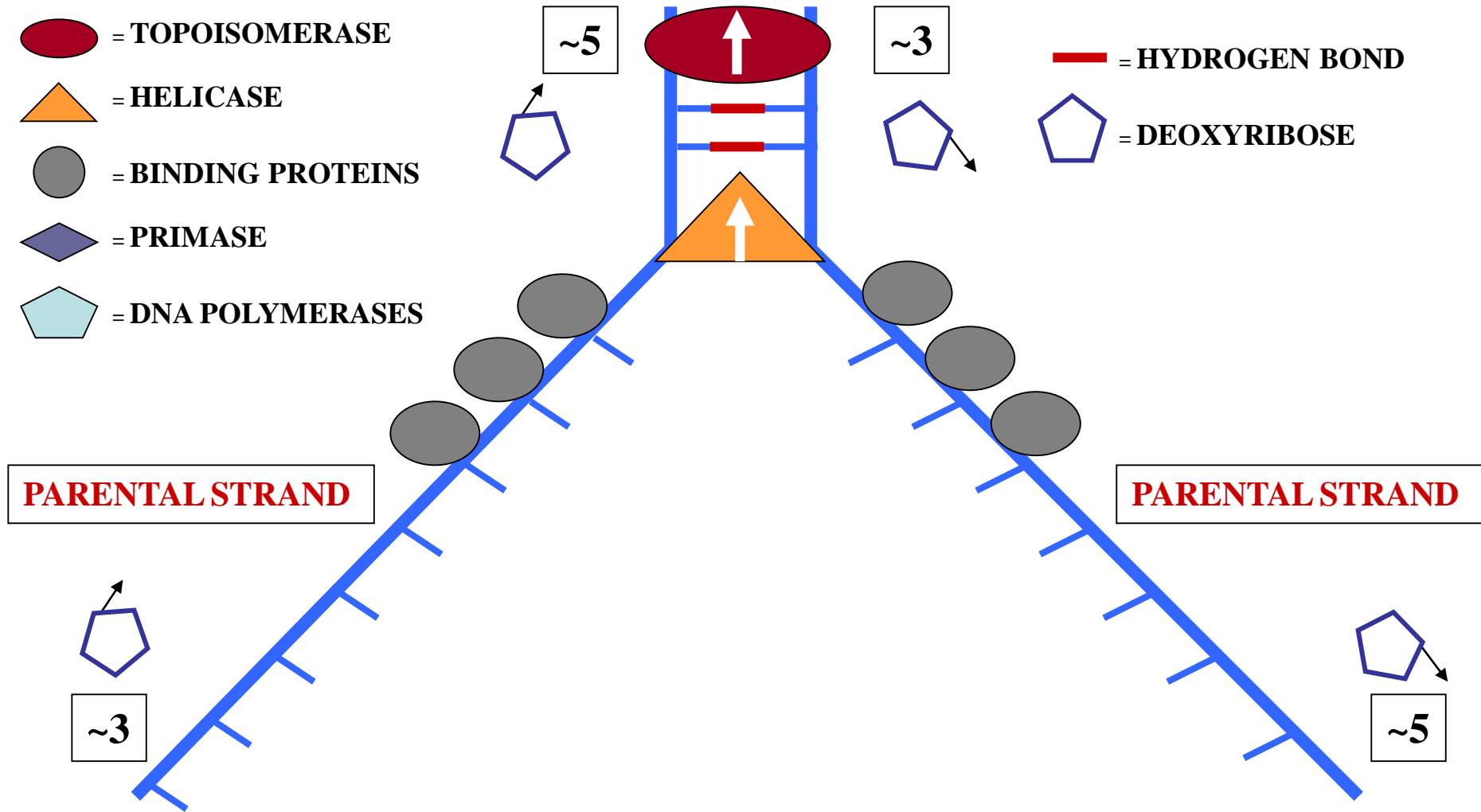
 = BINDING PROTEINS

 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE



REPLICATION - SPECIFICS



 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

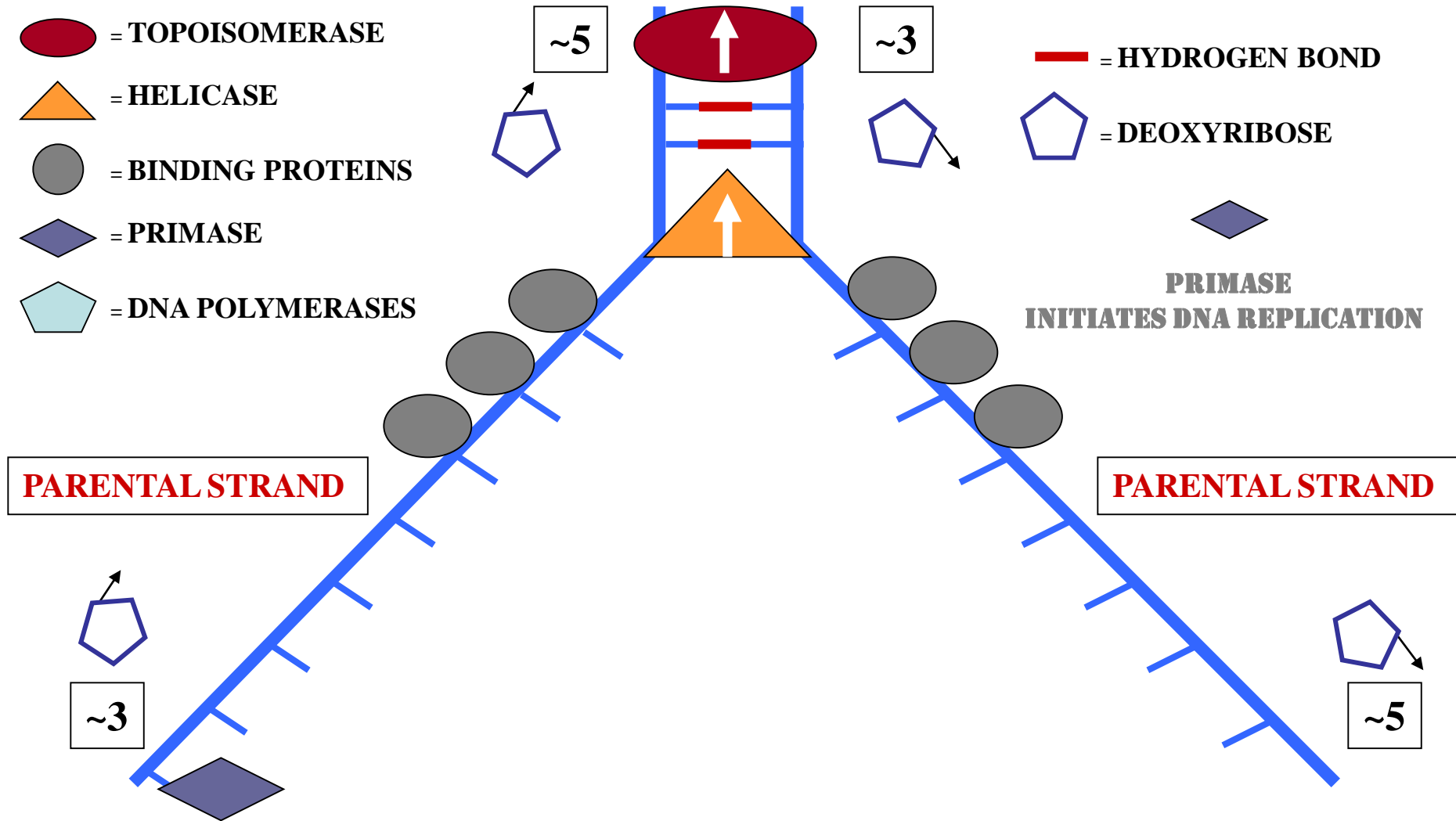
 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE


PRIMASE
INITIATES DNA REPLICATION



REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

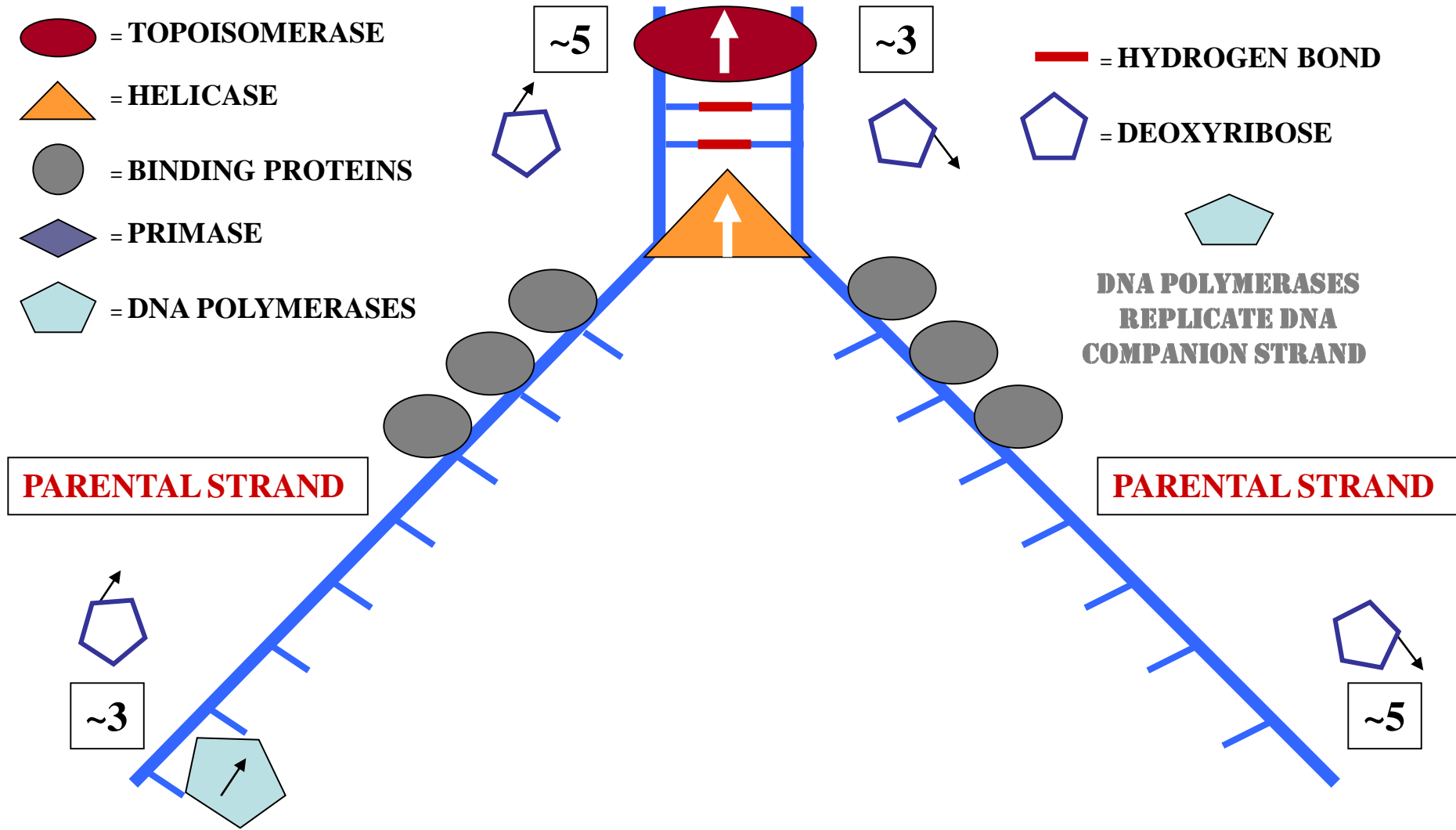
 = PRIMASE

 = DNA POLYMERASES






 = HYDROGEN BOND



 = DEOXYRIBOSE


DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND

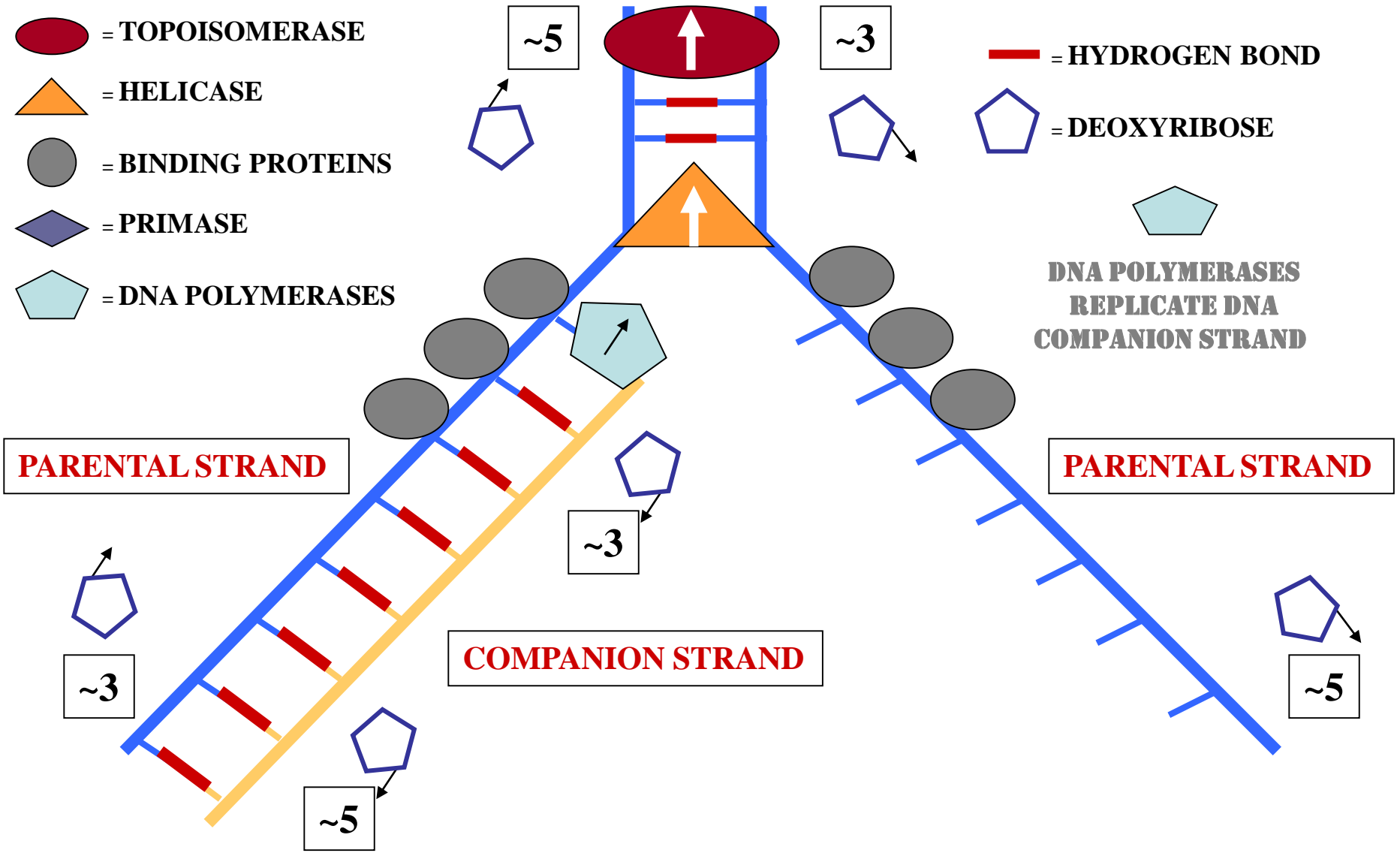


REPLICATION - SPECIFICS

-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

-  = HYDROGEN BOND
-  = DEOXYRIBOSE

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND**

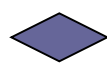


REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE

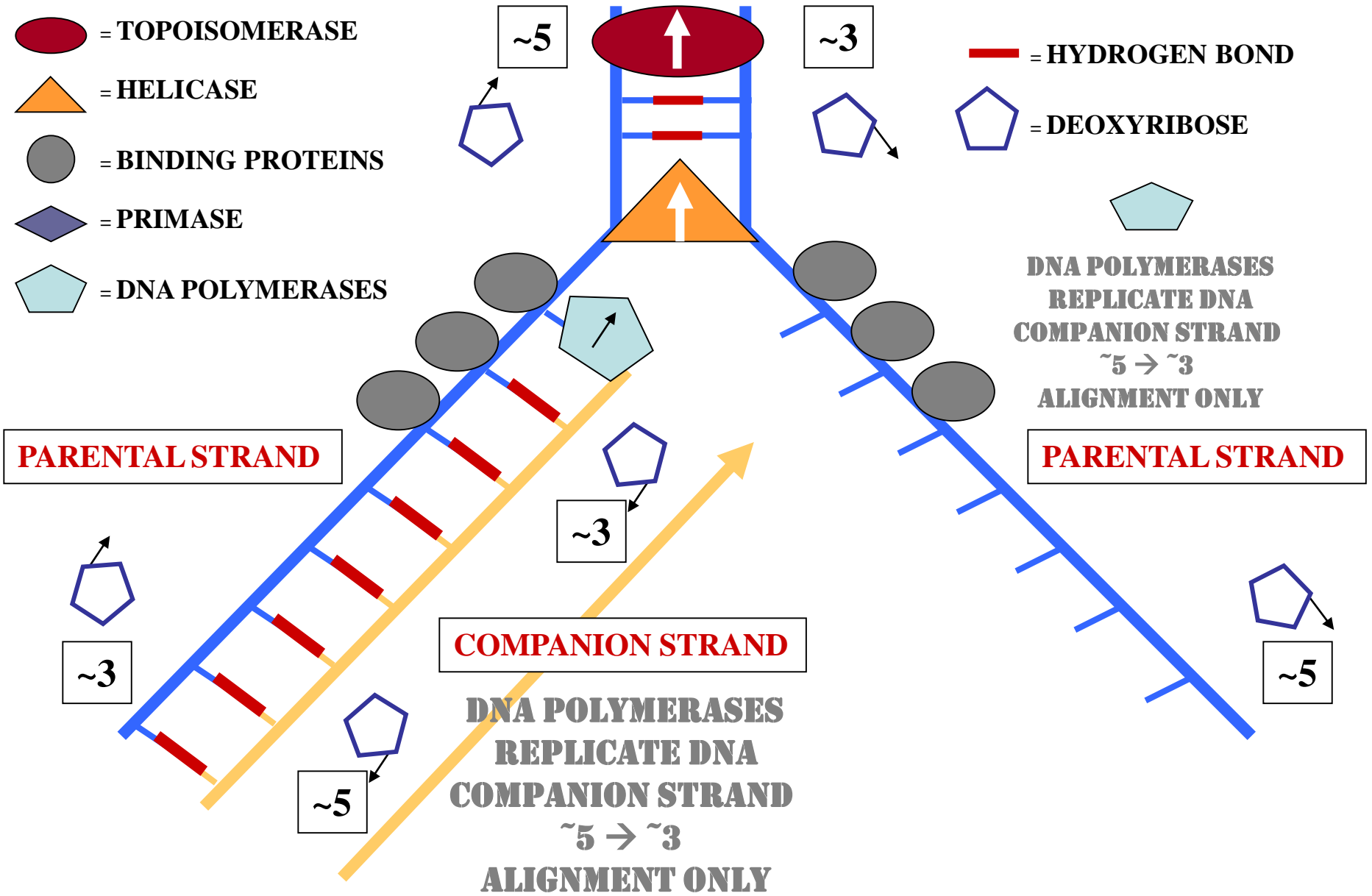
**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**

PARENTAL STRAND






PARENTAL STRAND

COMPANION STRAND

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**



REPLICATION - SPECIFICS

-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

 = HYDROGEN BOND

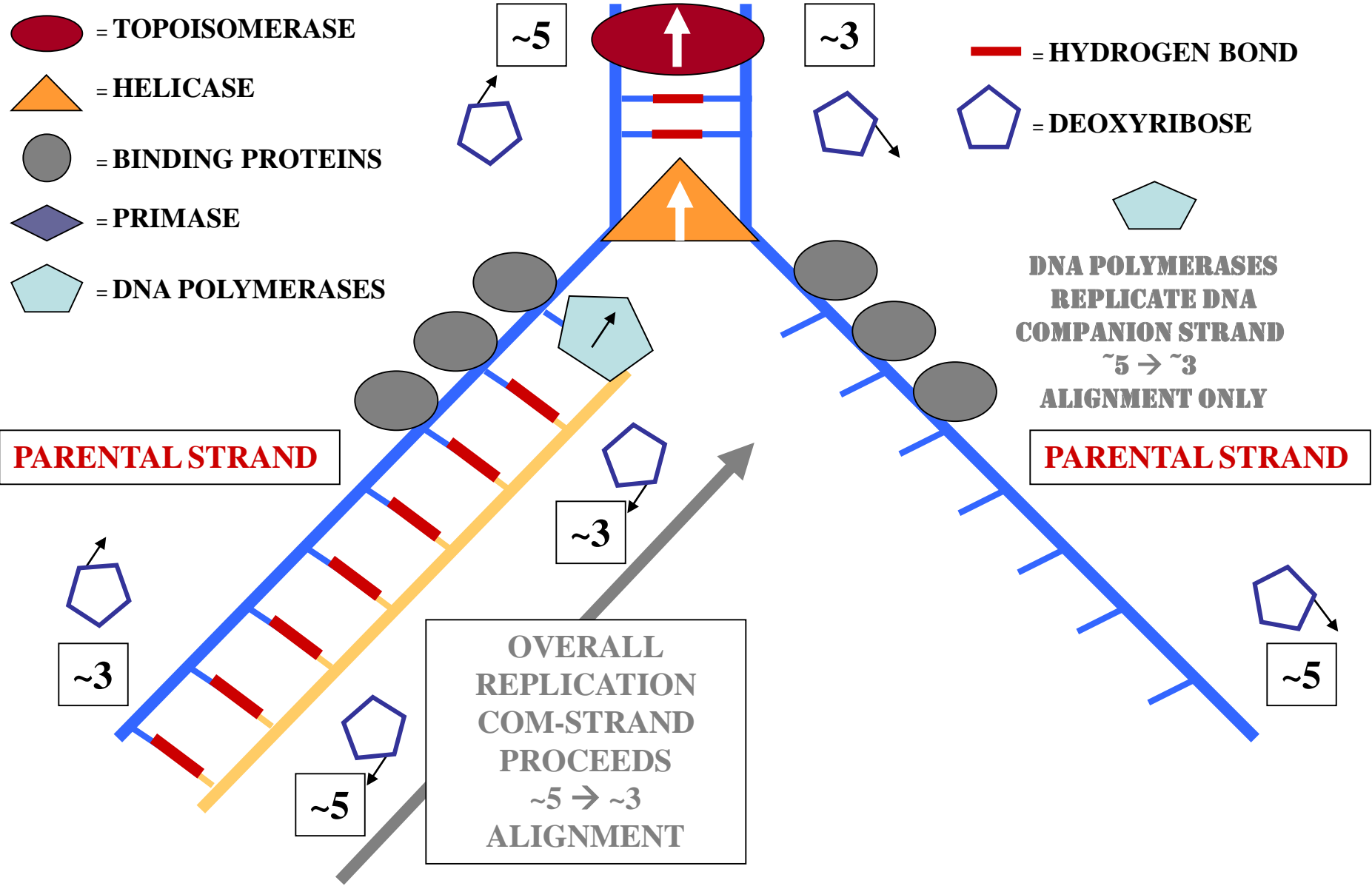
 = DEOXYRIBOSE

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**






PARENTAL STRAND



PARENTAL STRAND

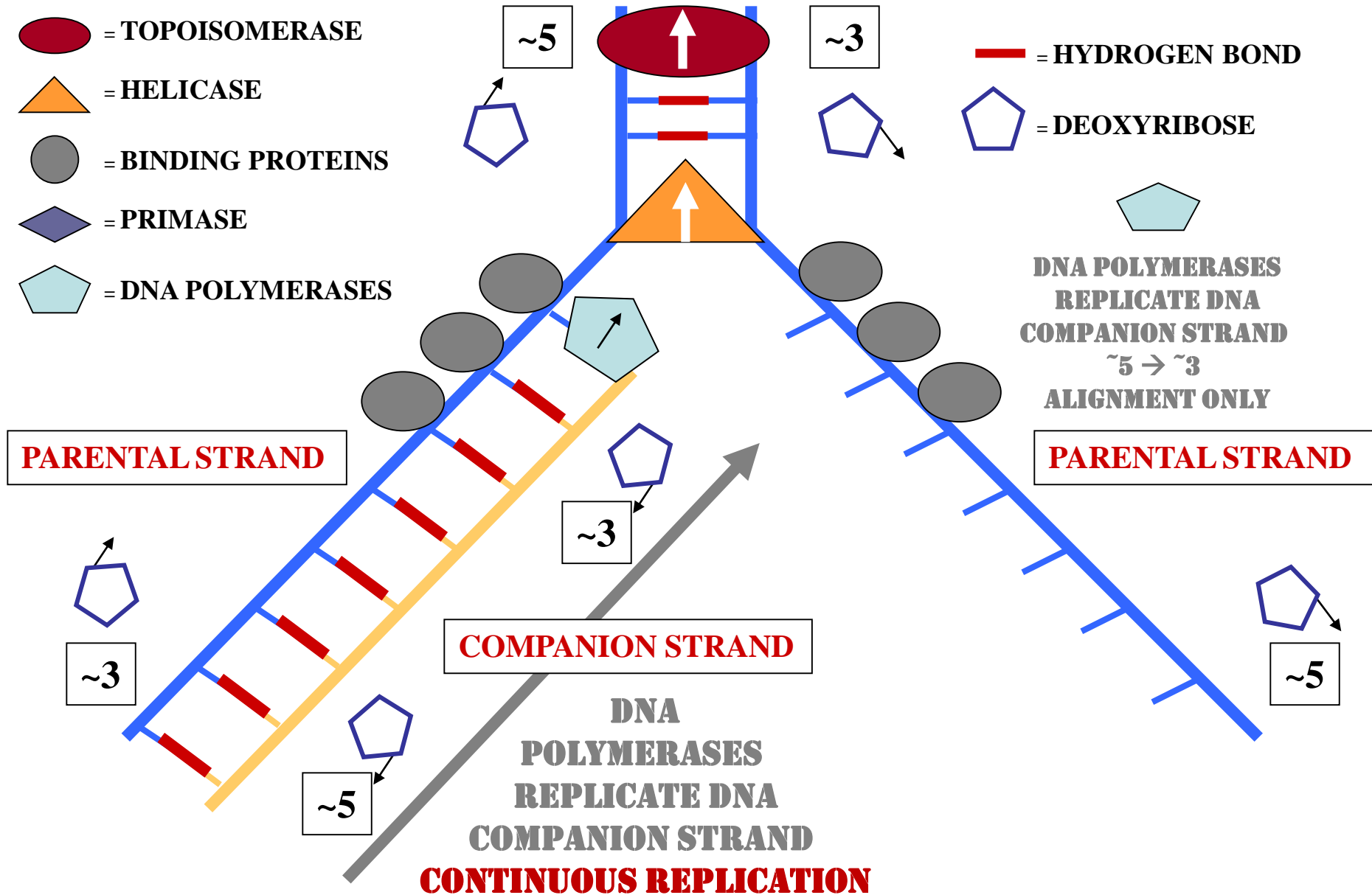
**OVERALL
REPLICATION
COM-STRAND
PROCEEDS
~5 → ~3
ALIGNMENT**








REPLICATION - SPECIFICS

-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

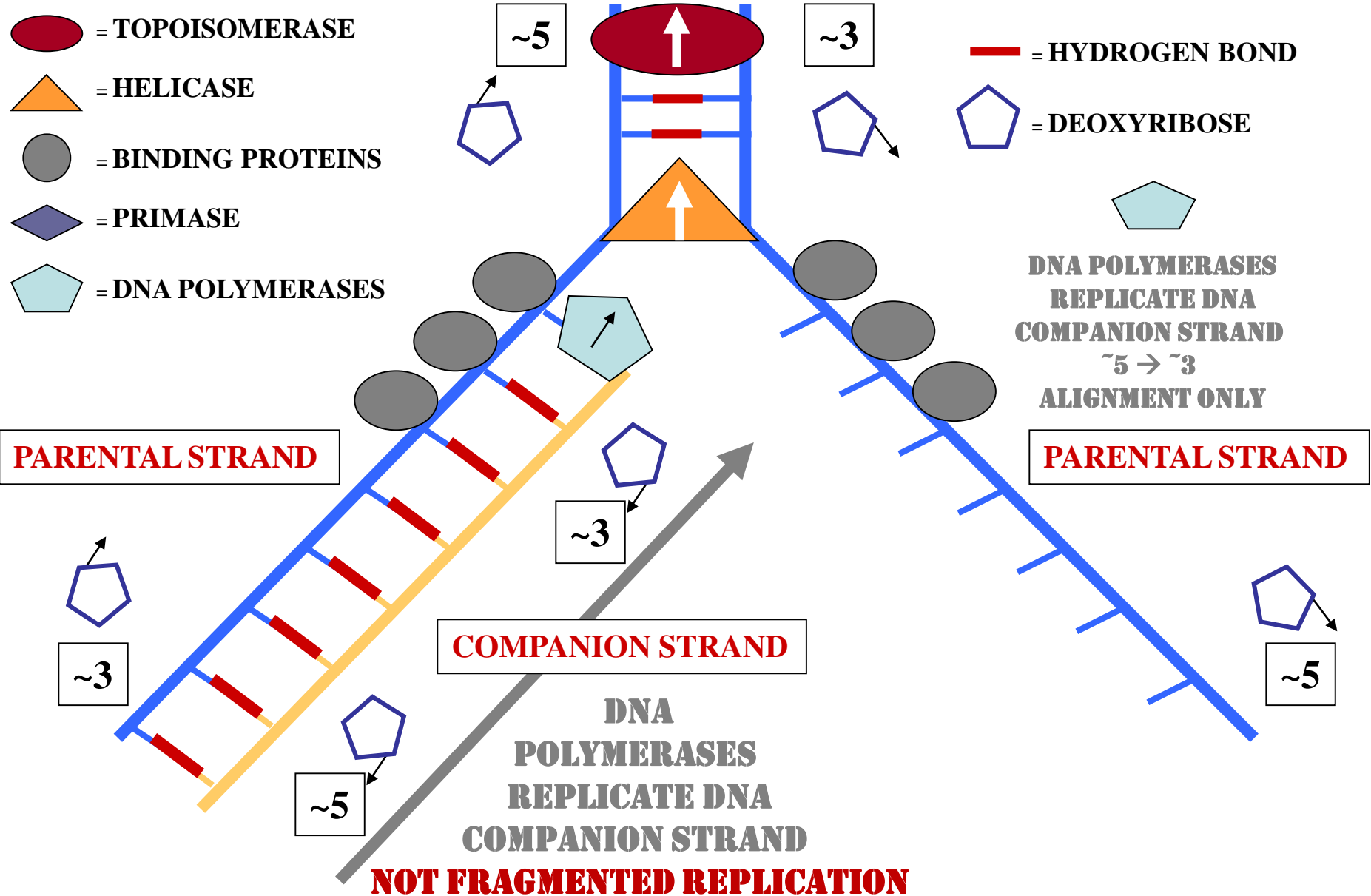
-  = HYDROGEN BOND
-  = DEOXYRIBOSE



REPLICATION - SPECIFICS

-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

-  = HYDROGEN BOND
-  = DEOXYRIBOSE



**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**

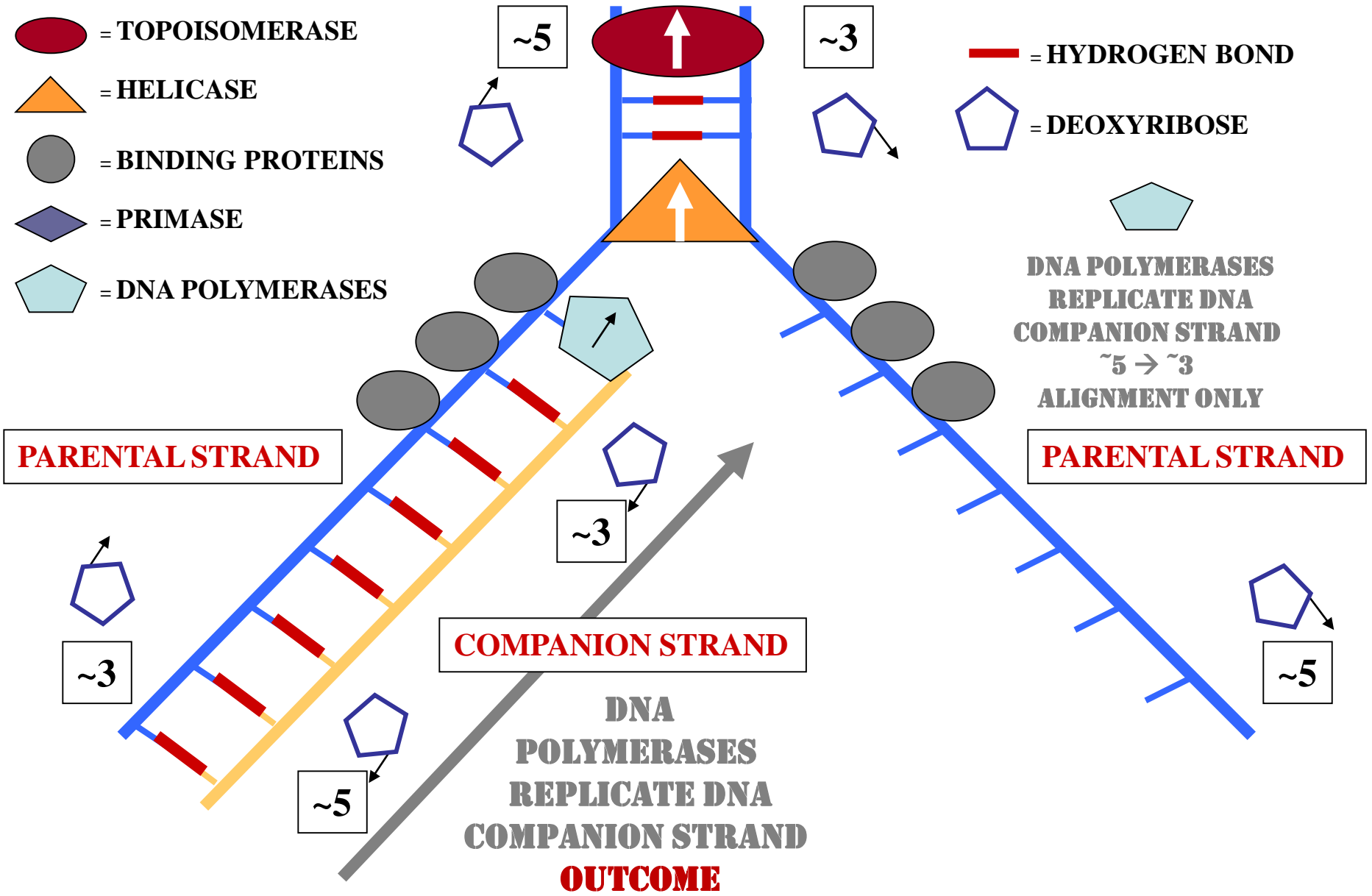
**DNA
POLYMERASES
REPLICATE DNA
COMPANION STRAND**

NOT FRAGMENTED REPLICATION

REPLICATION - SPECIFICS

- = TOPOISOMERASE
- = HELICASE
- = BINDING PROTEINS
- = PRIMASE
- = DNA POLYMERASES

- = HYDROGEN BOND
- = DEOXYRIBOSE



DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY

DNA
POLYMERASES
REPLICATE DNA
COMPANION STRAND
OUTCOME

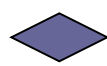


REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE

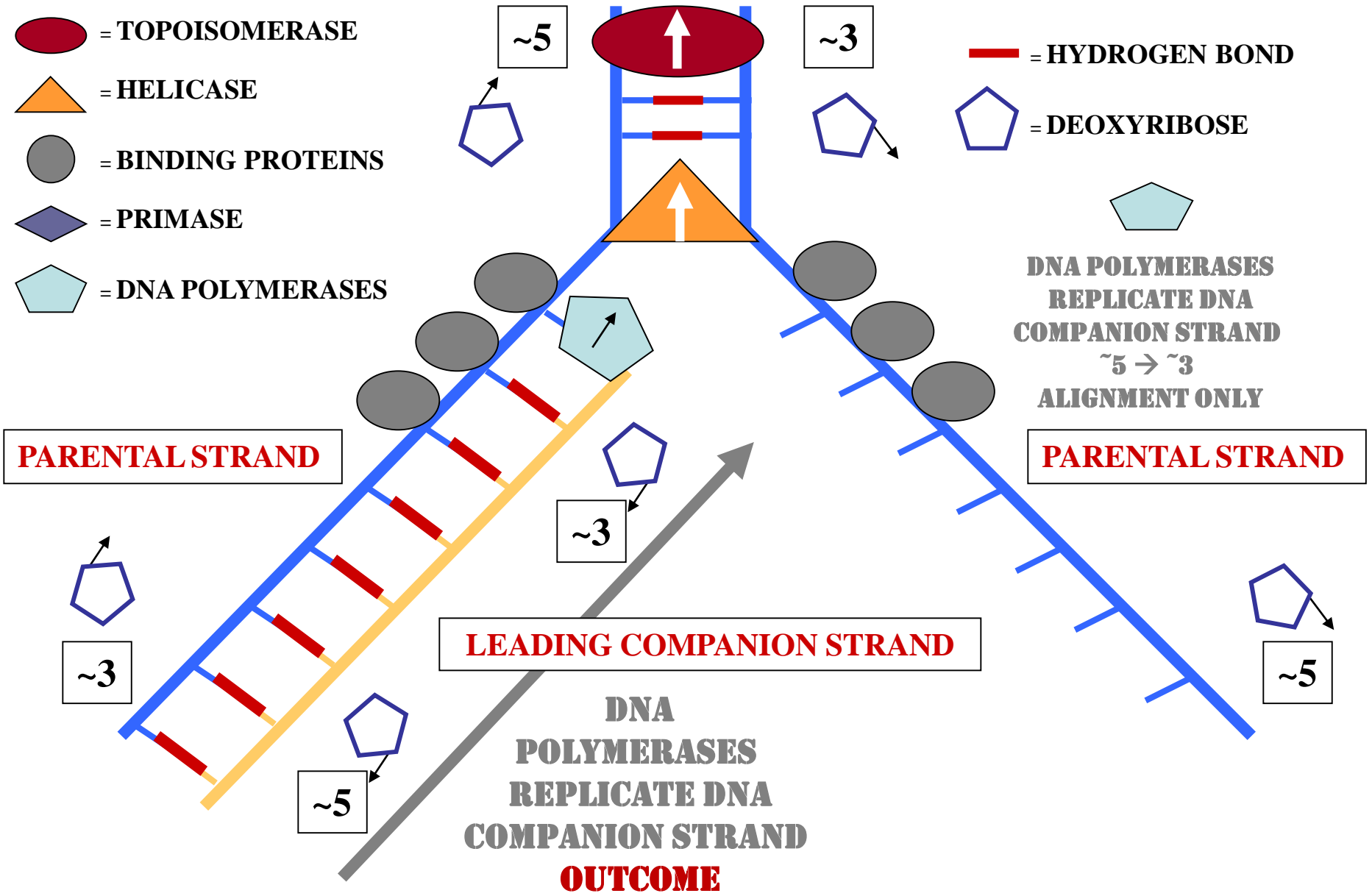
**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**

PARENTAL STRAND

PARENTAL STRAND

LEADING COMPANION STRAND

**DNA
POLYMERASES
REPLICATE DNA
COMPANION STRAND
OUTCOME**





PARENTAL STRANDS REPLICATION SPECIFICS

$\sim 5 \rightarrow \sim 3$

PARENTAL STRAND

REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

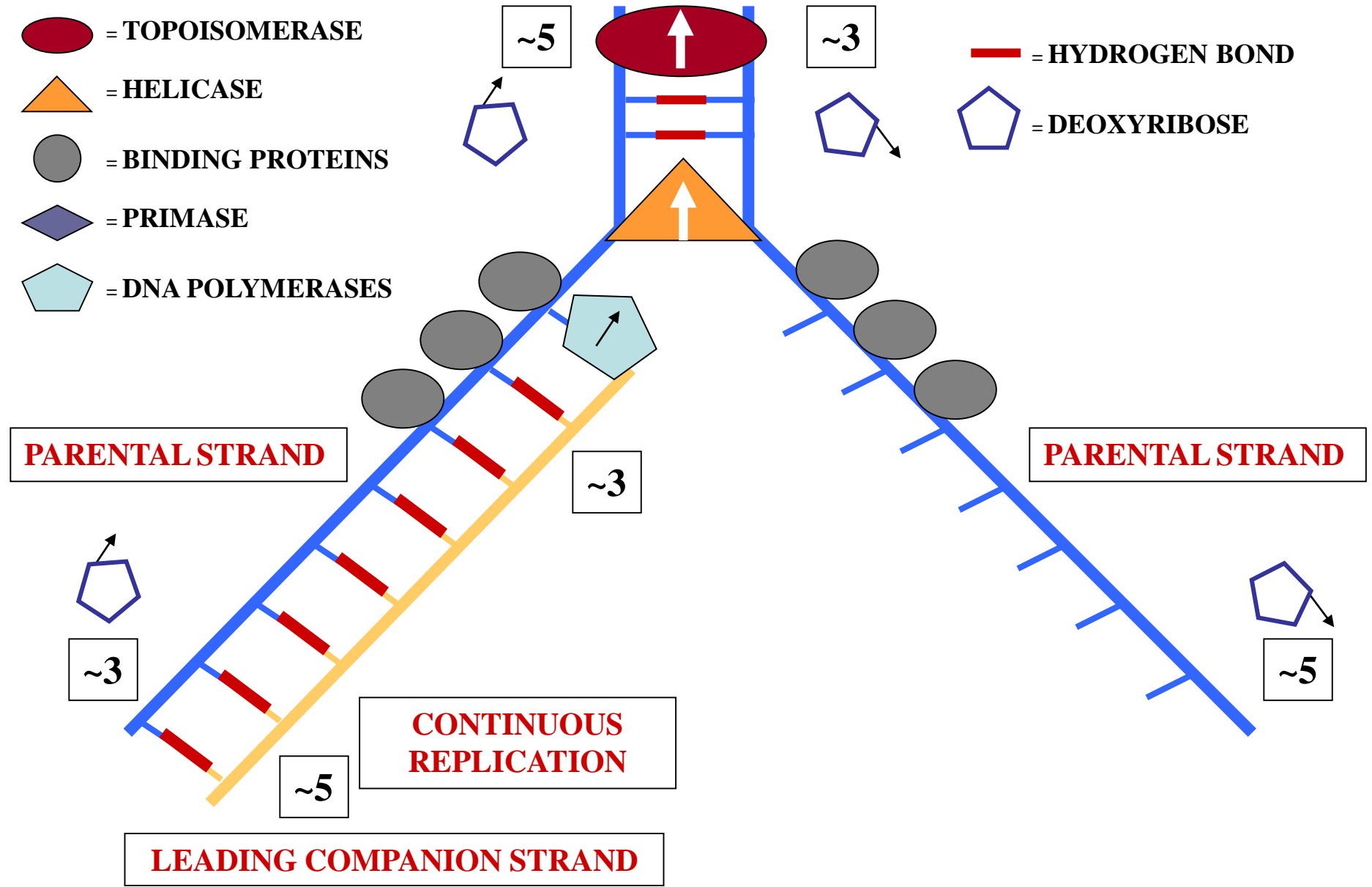
 = BINDING PROTEINS

 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE



REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

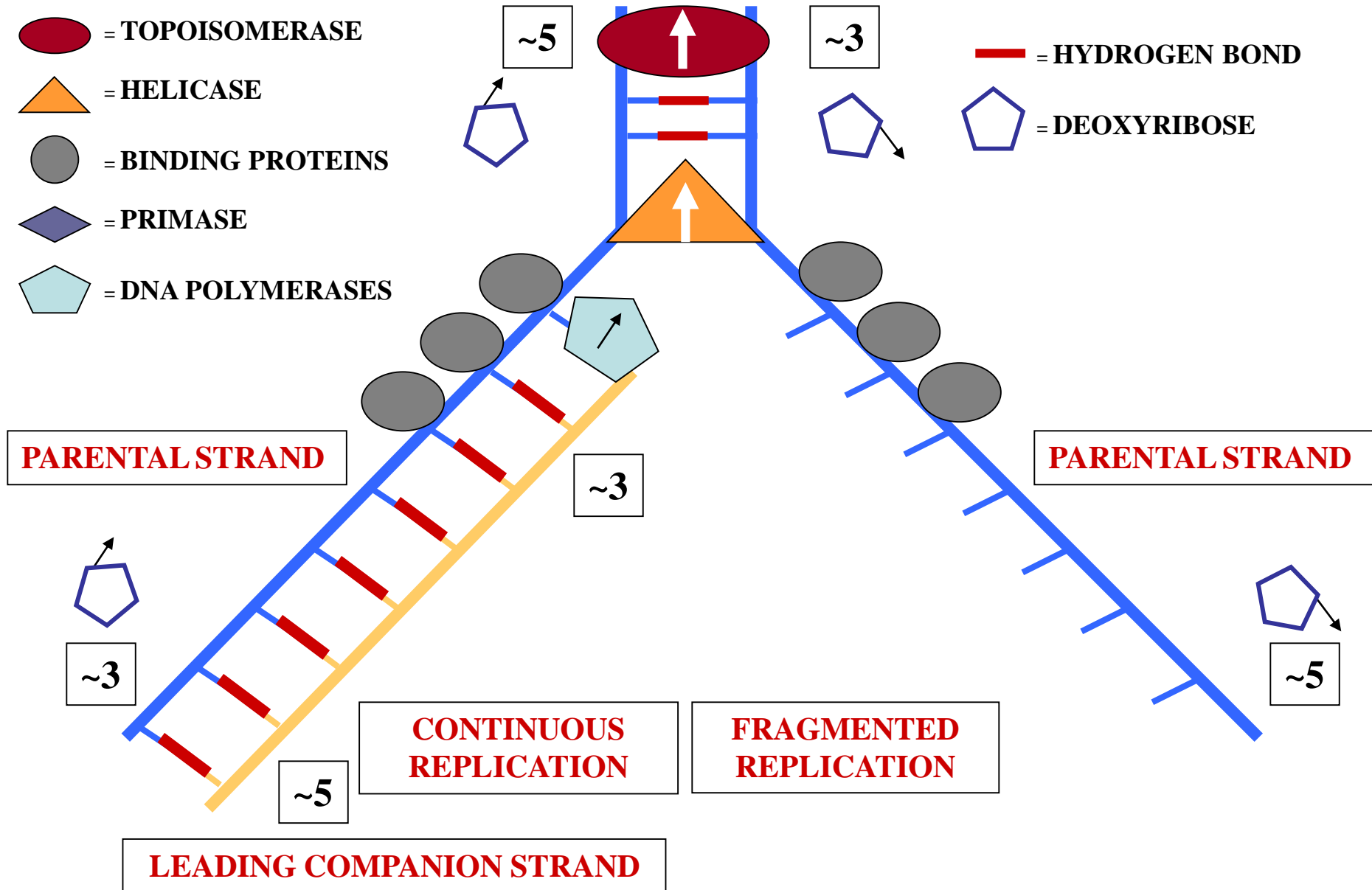
 = BINDING PROTEINS

 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE



REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

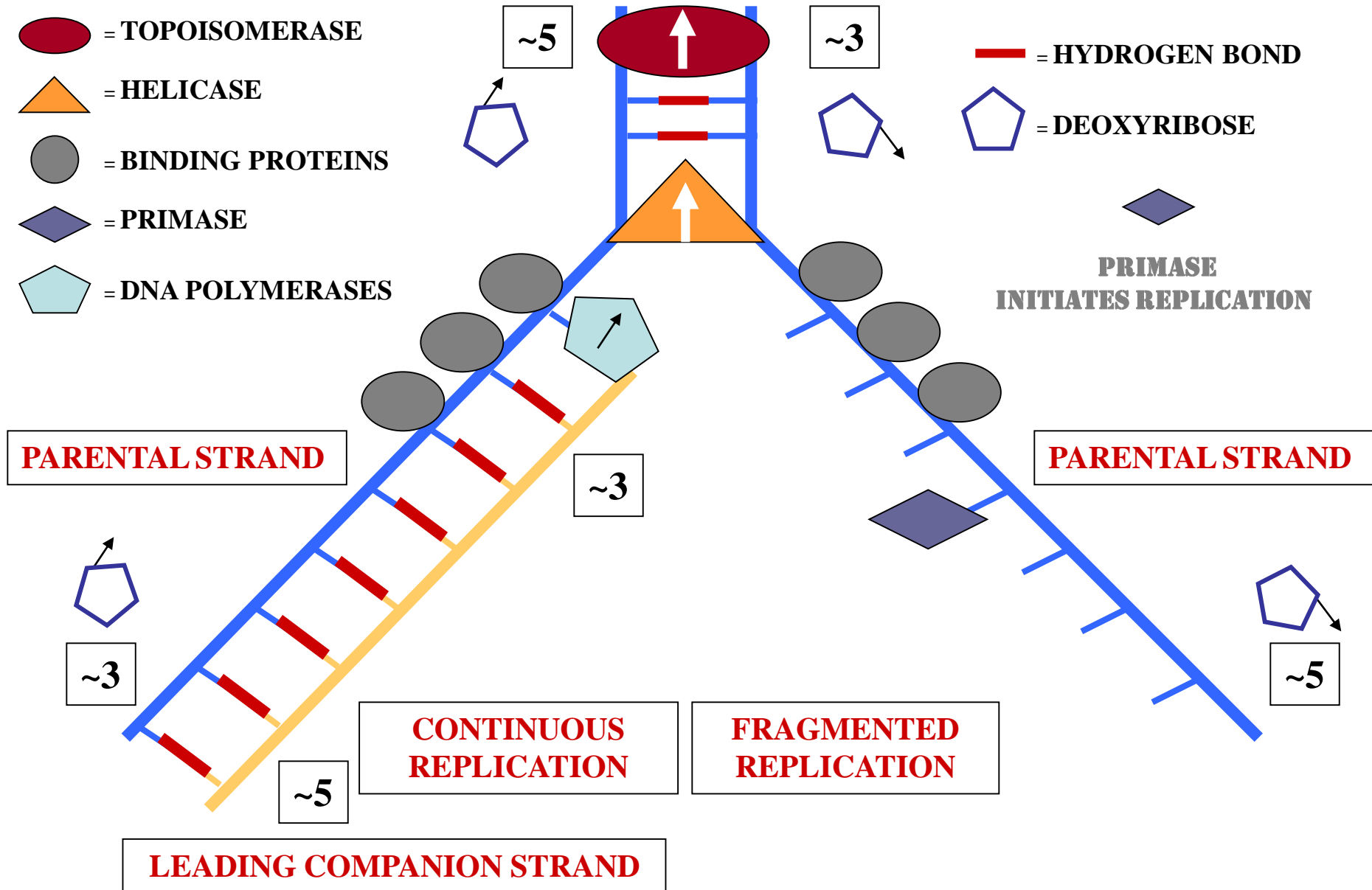
 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE

 PRIMASE
INITIATES REPLICATION



REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

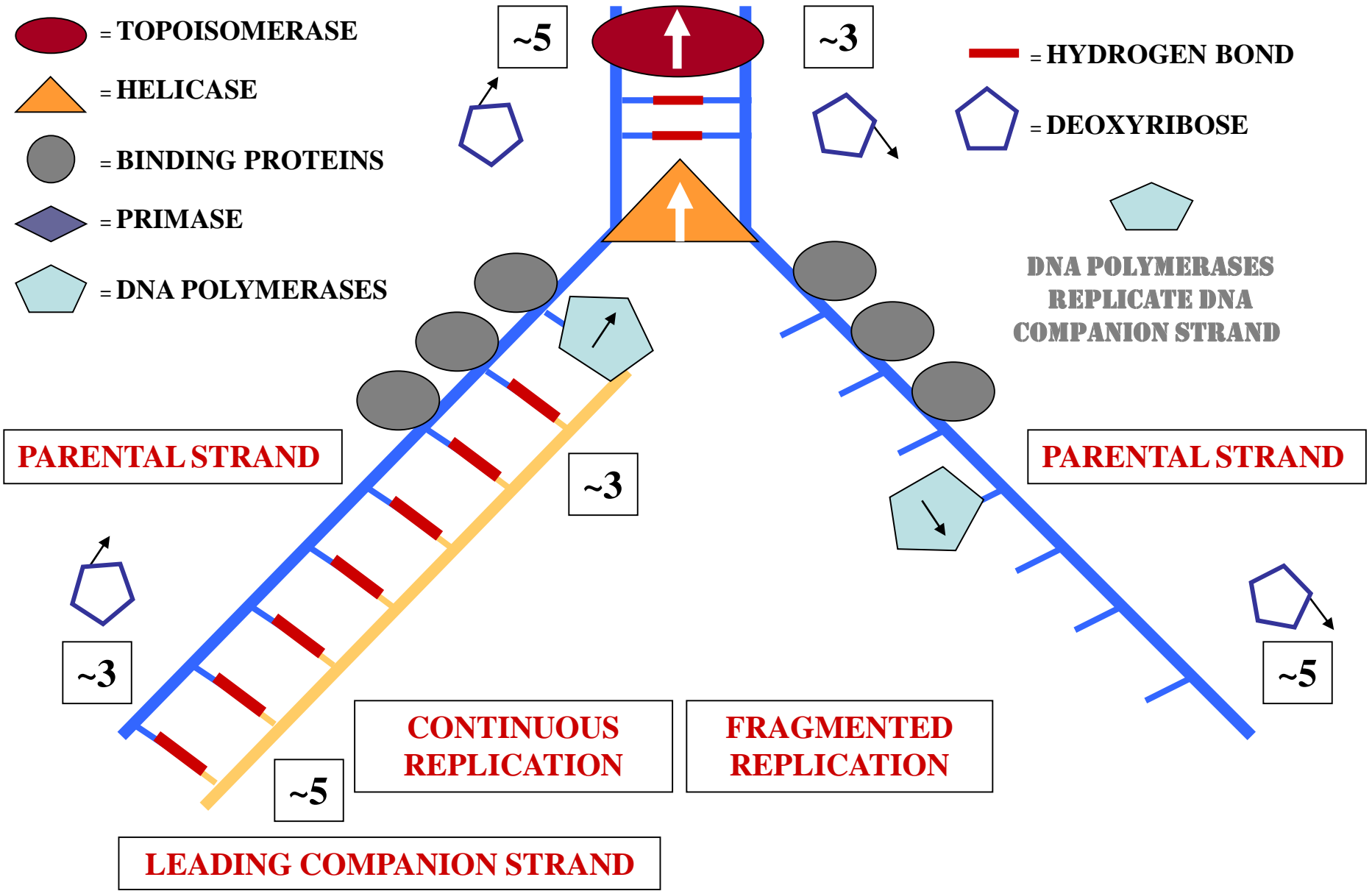
 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE


DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND



PARENTAL STRAND

PARENTAL STRAND

CONTINUOUS REPLICATION

FRAGMENTED REPLICATION

LEADING COMPANION STRAND

REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**

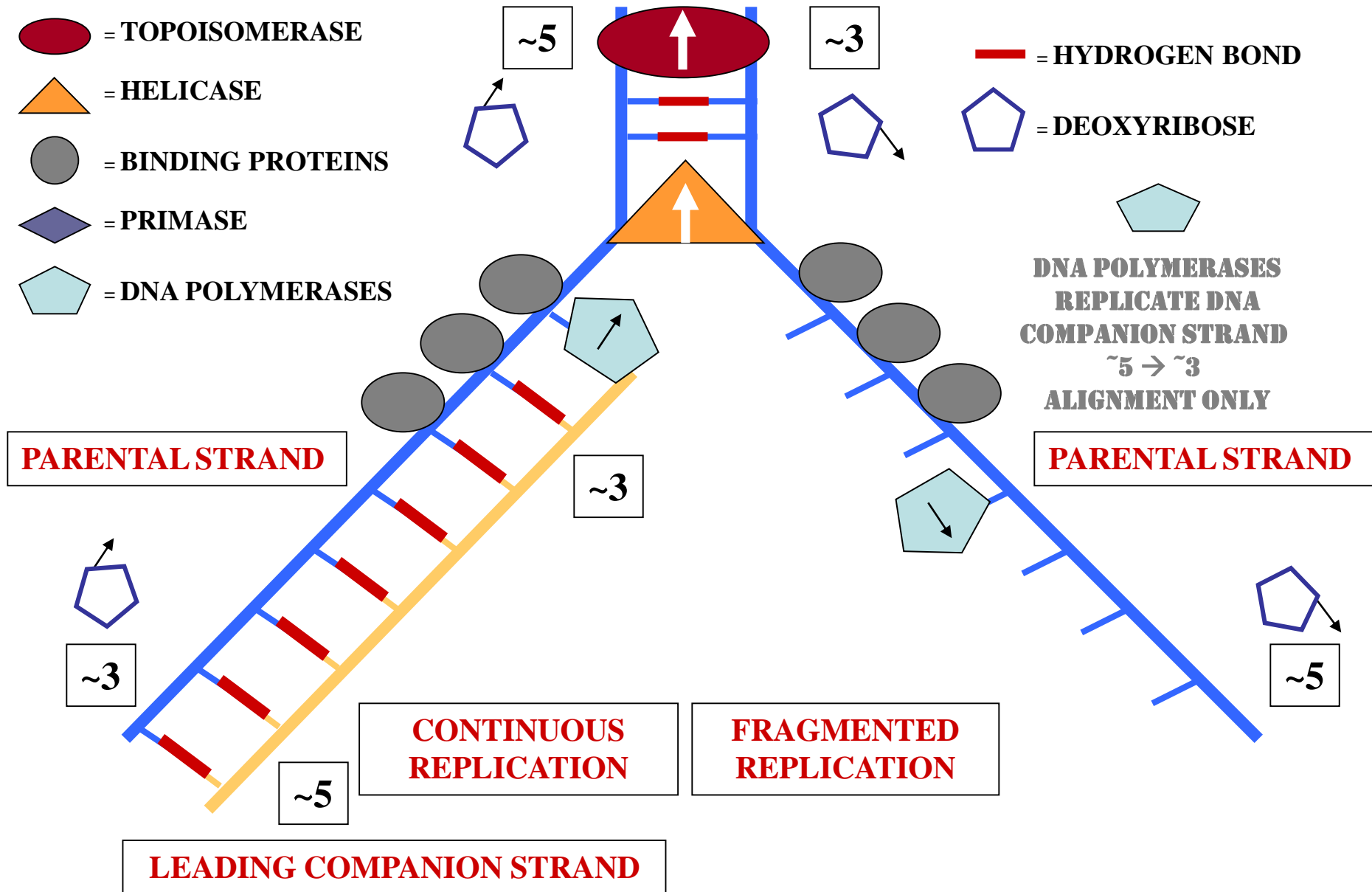
PARENTAL STRAND

PARENTAL STRAND

**CONTINUOUS
REPLICATION**

**FRAGMENTED
REPLICATION**

LEADING COMPANION STRAND



REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

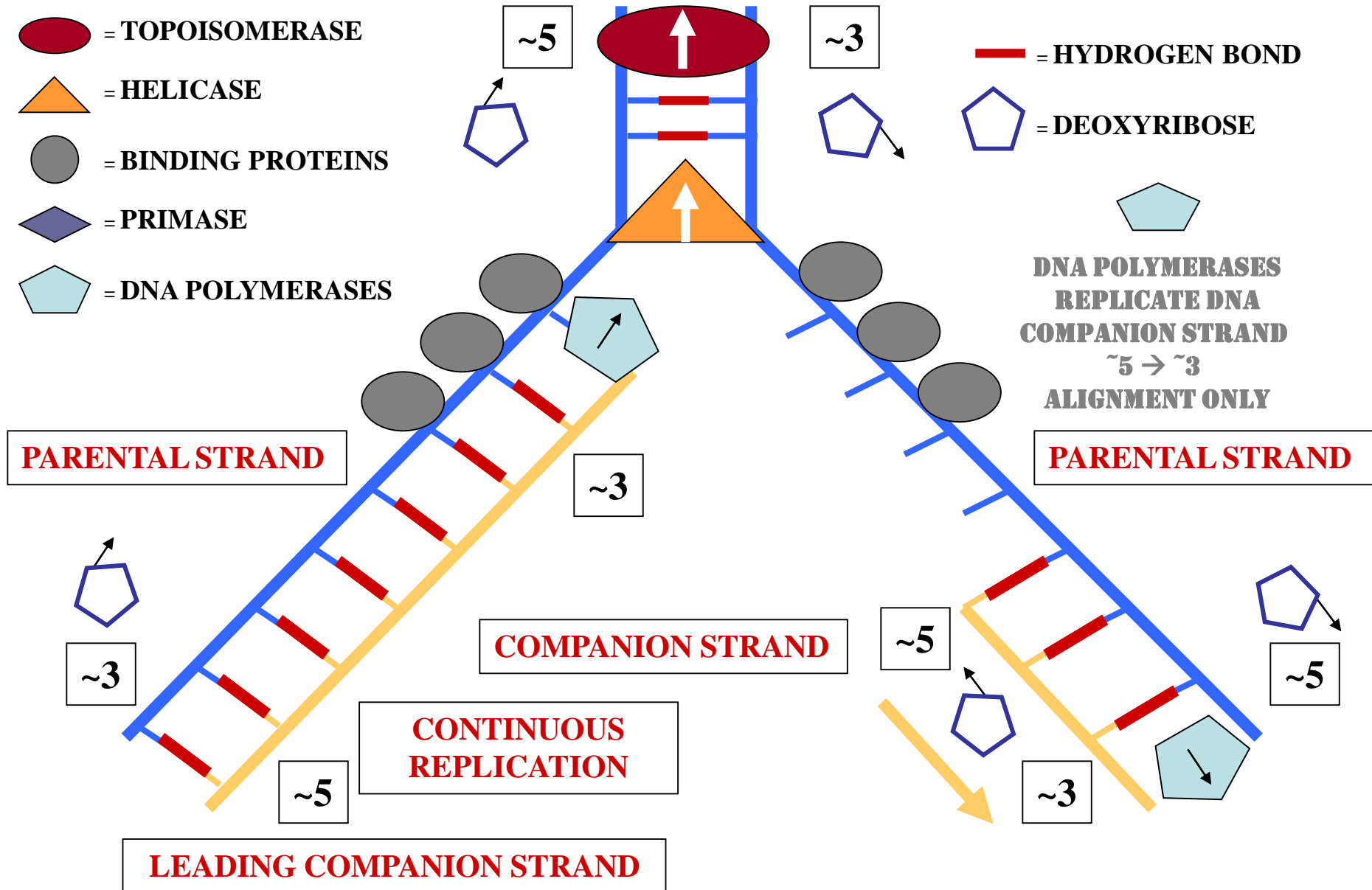
 = PRIMASE

 = DNA POLYMERASES






 = HYDROGEN BOND



 = DEOXYRIBOSE

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**

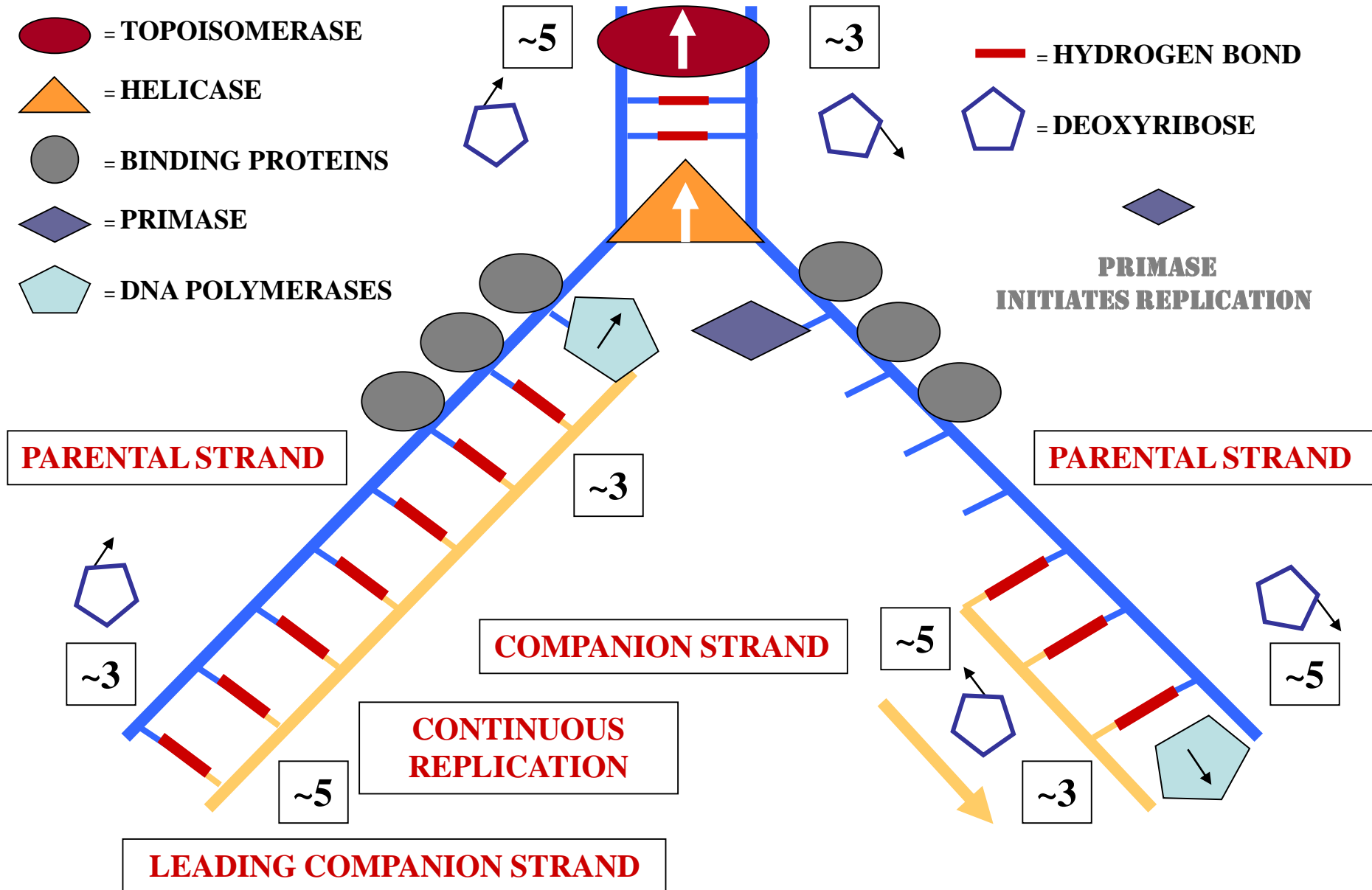


REPLICATION - SPECIFICS

-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

-  = HYDROGEN BOND
-  = DEOXYRIBOSE

**PRIMASE
INITIATES REPLICATION**




REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE

 = BINDING PROTEINS

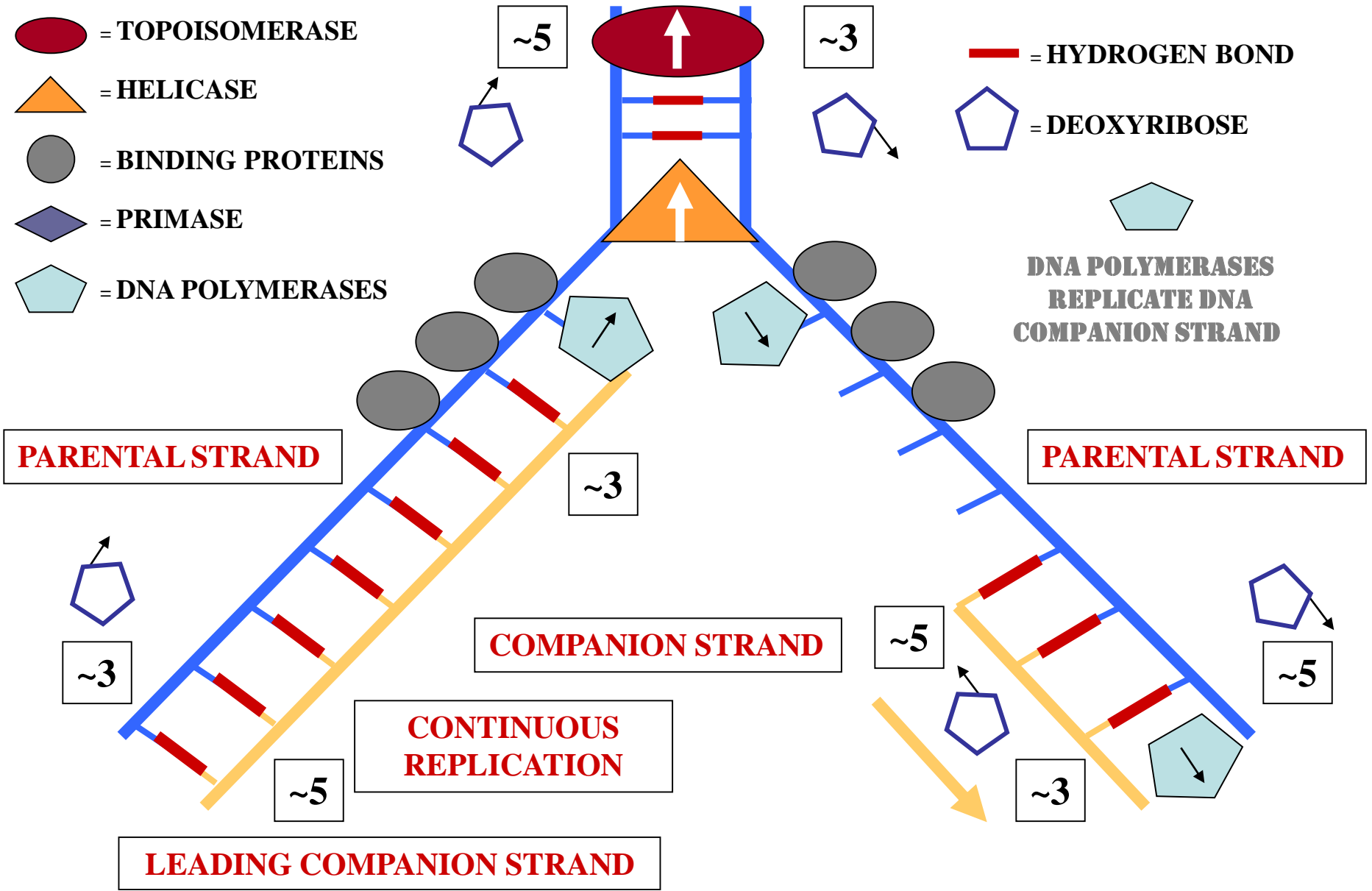
 = PRIMASE

 = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE


DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND



REPLICATION - SPECIFICS

 = TOPOISOMERASE

 = HELICASE


 = BINDING PROTEINS

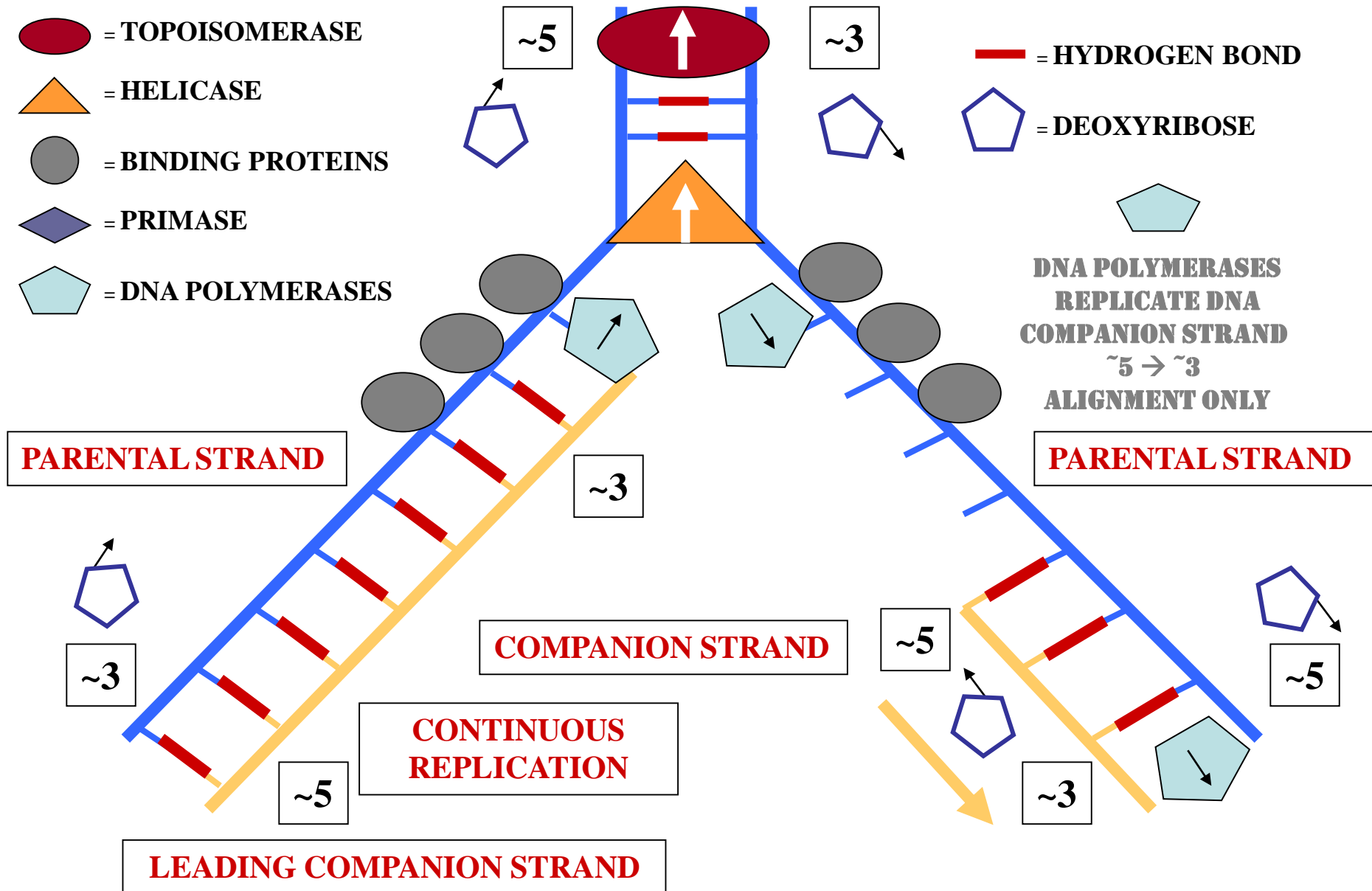
 = PRIMASE

 = DNA POLYMERASES

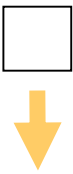
 = HYDROGEN BOND






 = DEOXYRIBOSE


DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY



REPLICATION - SPECIFICS

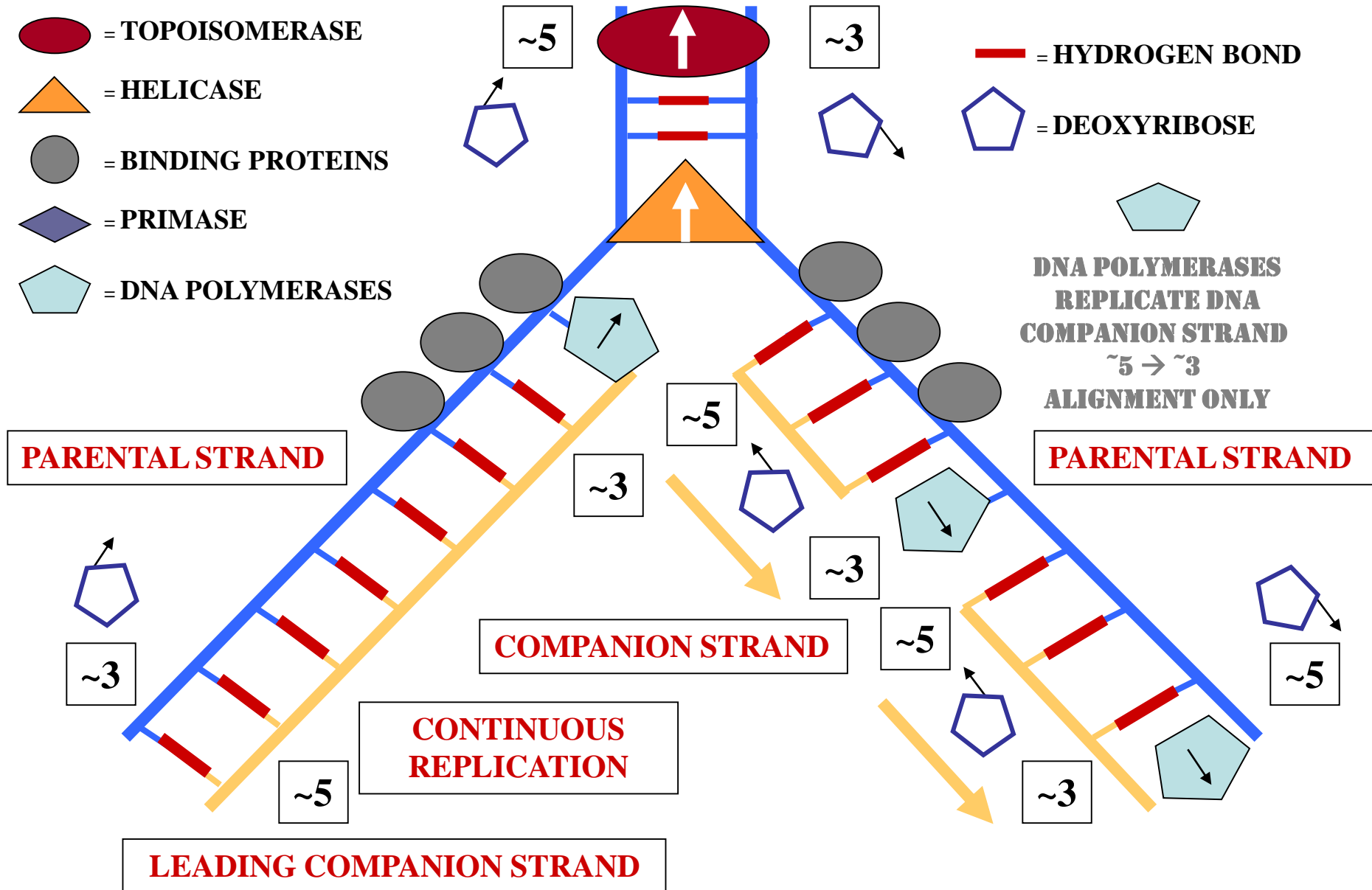


-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**



REPLICATION - SPECIFICS



= TOPOISOMERASE

= HELICASE

= BINDING PROTEINS

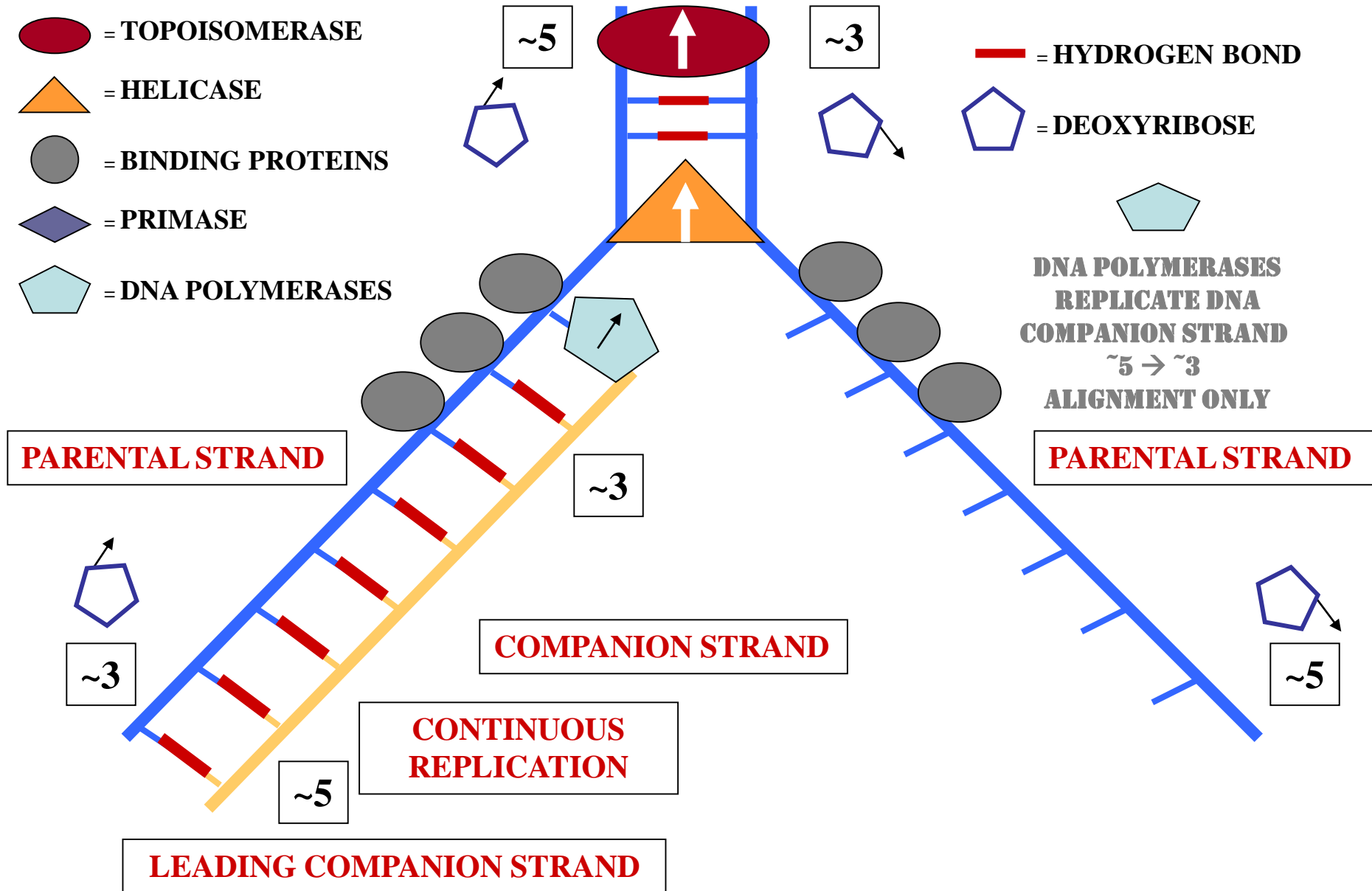
= PRIMASE

= DNA POLYMERASES

= HYDROGEN BOND

= DEOXYRIBOSE

DNA POLYMERASES
 REPLICATE DNA
 COMPANION STRAND
 $\sim 5 \rightarrow \sim 3$
 ALIGNMENT ONLY



REPLICATION - SPECIFICS

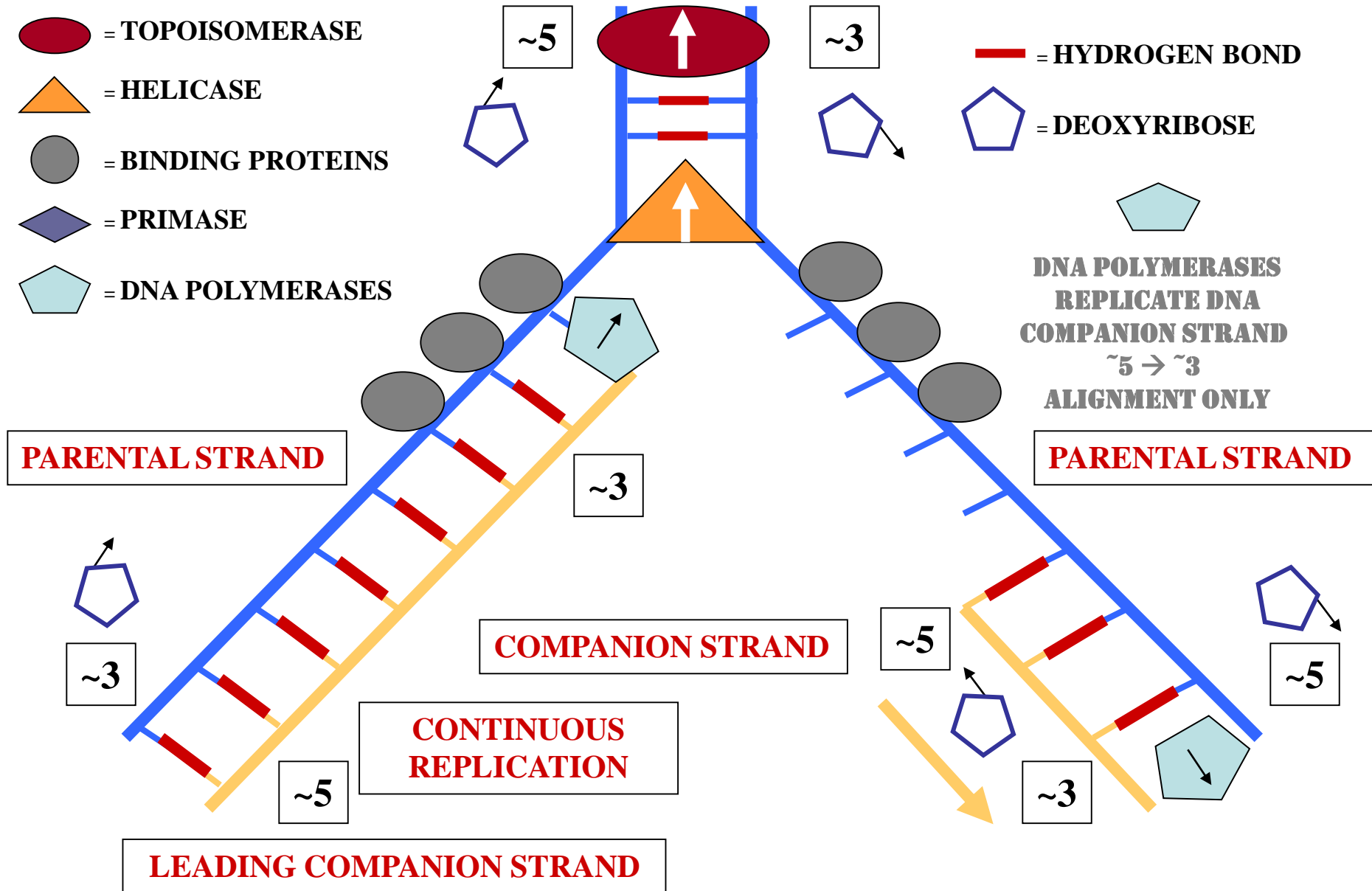


- = TOPOISOMERASE
- = HELICASE
- = BINDING PROTEINS
- = PRIMASE
- = DNA POLYMERASES

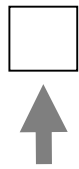
= HYDROGEN BOND





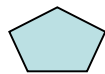
= DEOXYRIBOSE



**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**



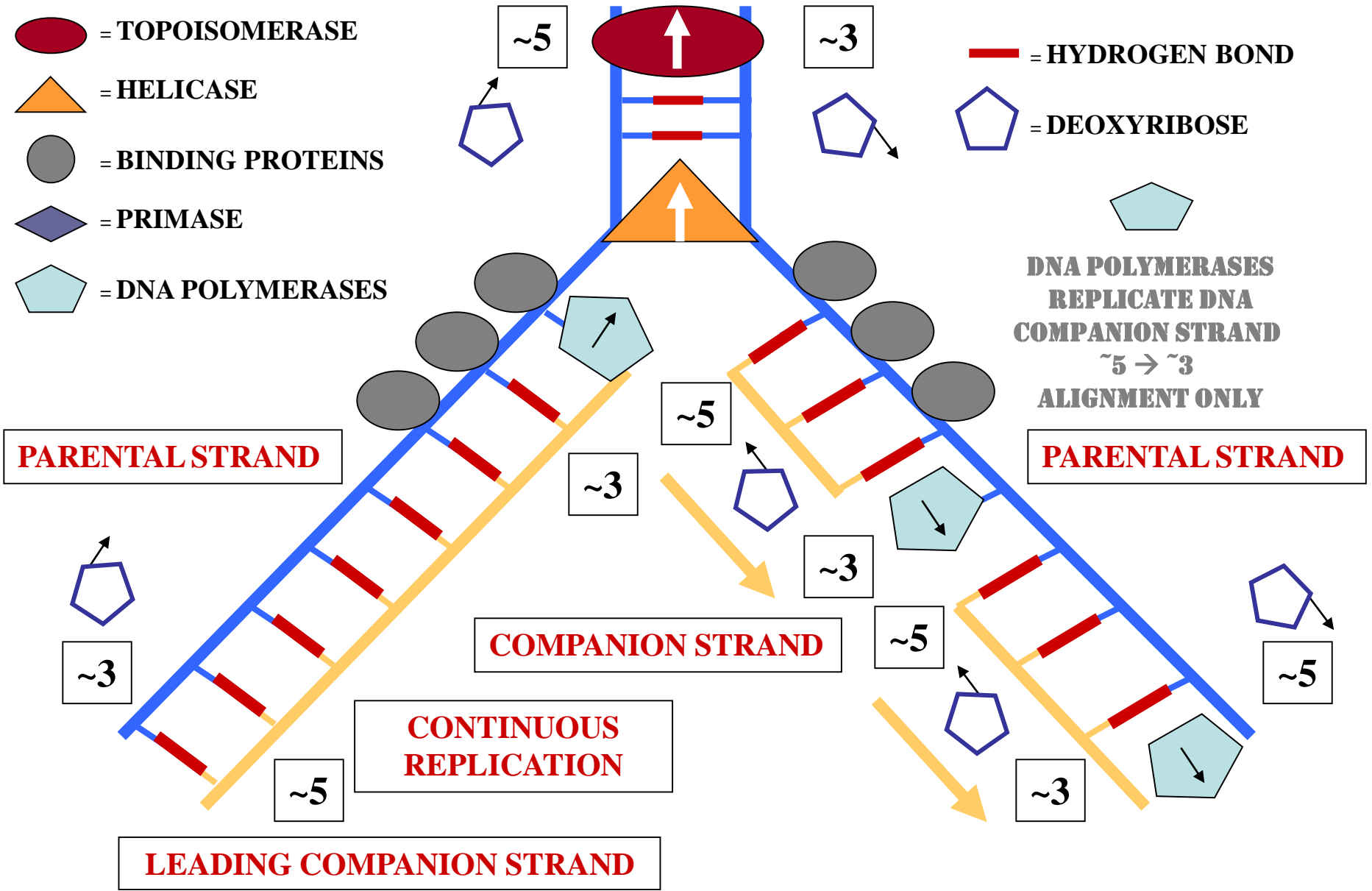
REPLICATION - SPECIFICS



-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

-  = HYDROGEN BOND
-  = DEOXYRIBOSE

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**



REPLICATION - SPECIFICS



= TOPOISOMERASE

= HELICASE

= BINDING PROTEINS

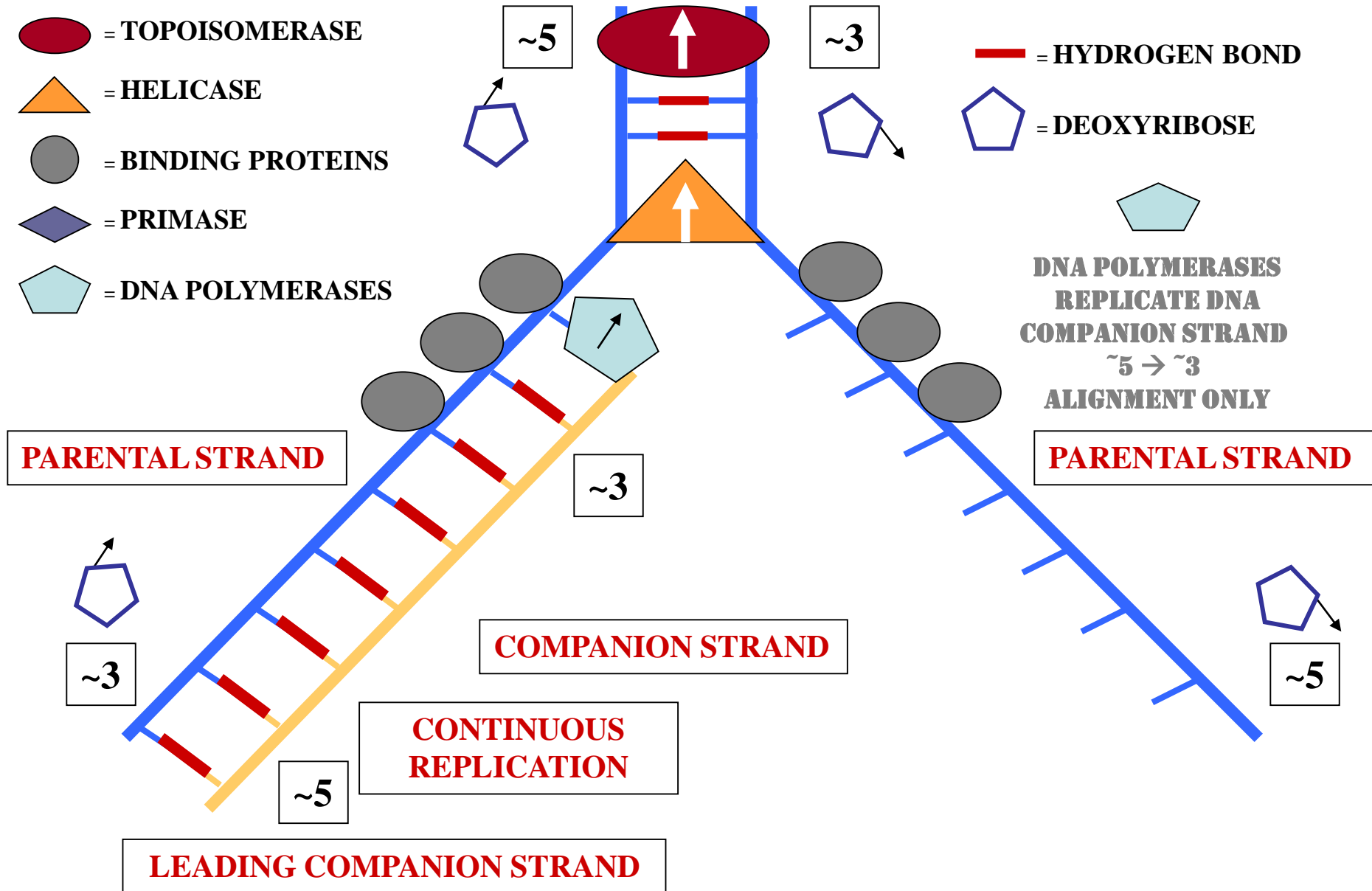
= PRIMASE

= DNA POLYMERASES

= HYDROGEN BOND






= DEOXYRIBOSE

DNA POLYMERASES
 REPLICATE DNA
 COMPANION STRAND
 ~5 → ~3
 ALIGNMENT ONLY



REPLICATION - SPECIFICS

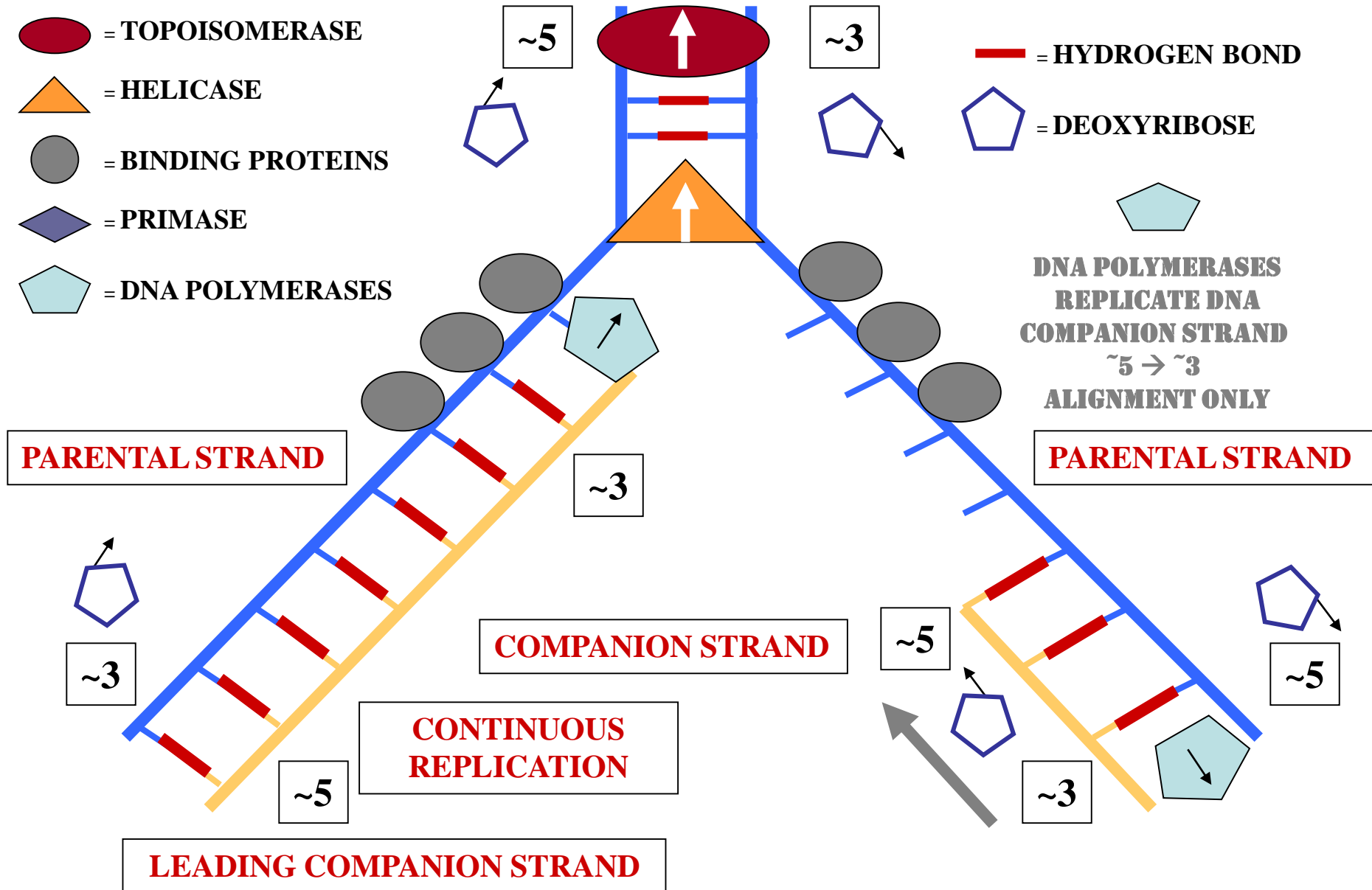


-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES






 = HYDROGEN BOND

 = DEOXYRIBOSE

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**



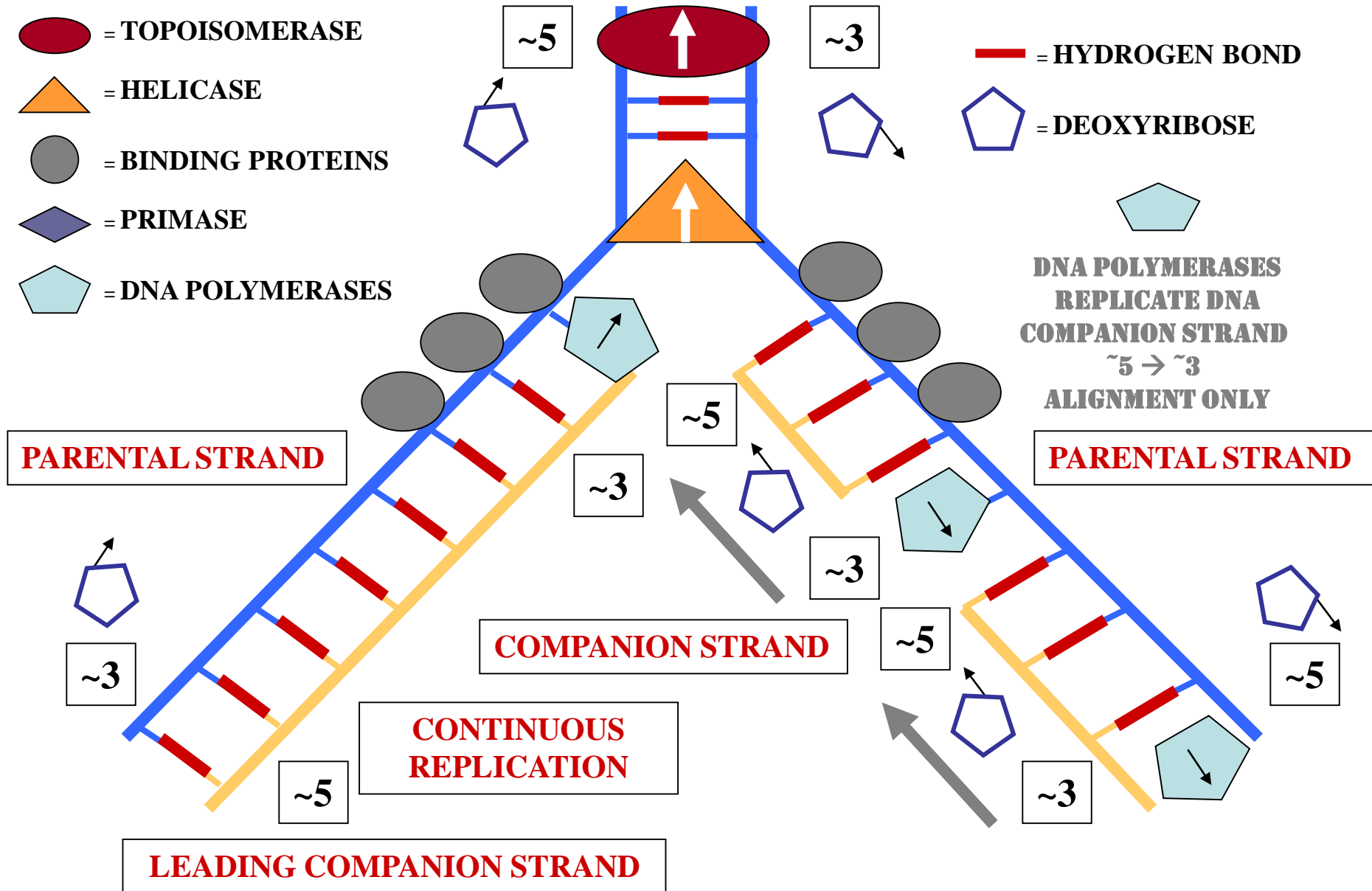
REPLICATION - SPECIFICS

-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES






 = HYDROGEN BOND

 = DEOXYRIBOSE

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**



REPLICATION - SPECIFICS

-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

 = HYDROGEN BOND

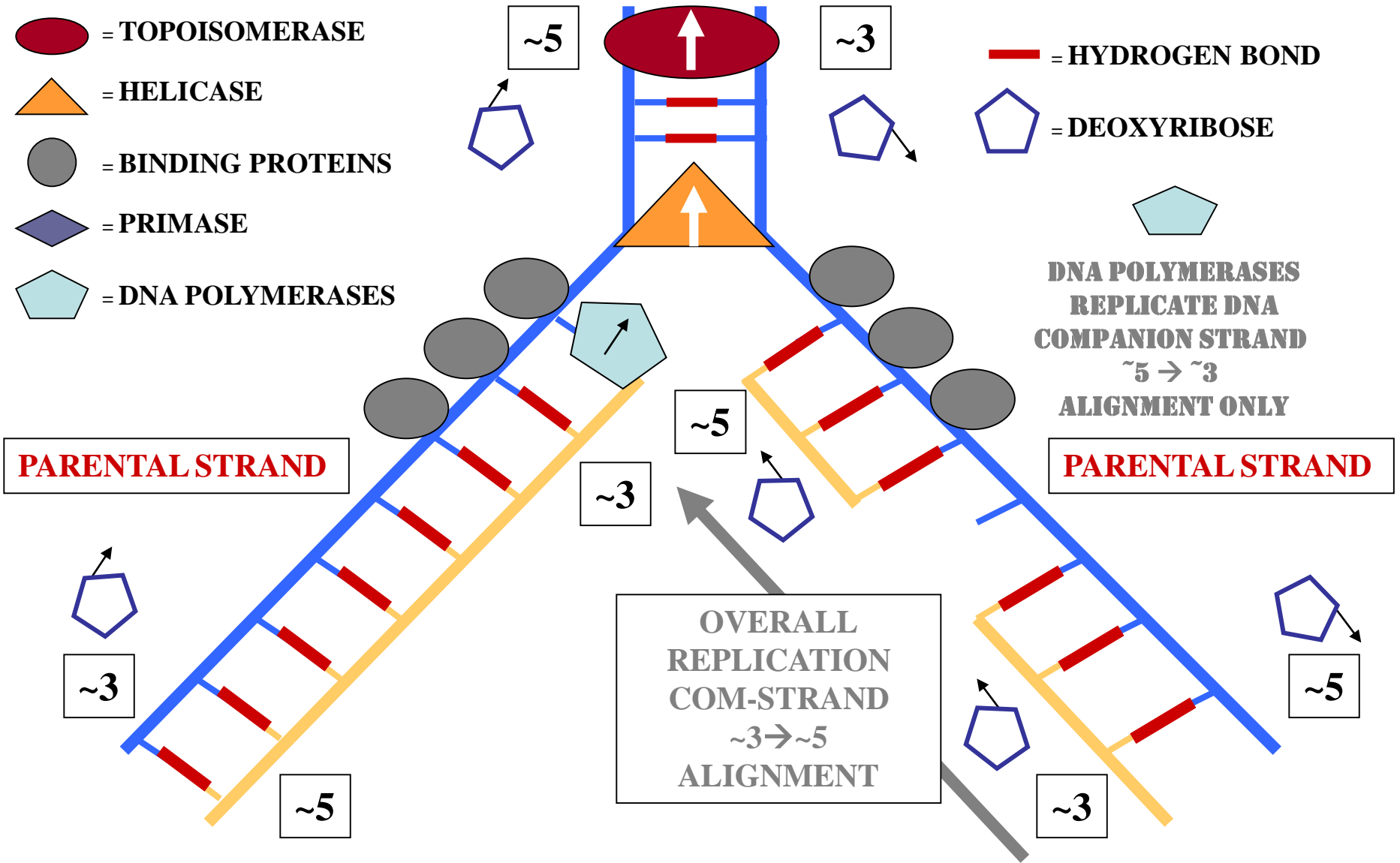
 = DEOXYRIBOSE

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**

PARENTAL STRAND

PARENTAL STRAND

**OVERALL
REPLICATION
COM-STRAND
~3 → ~5
ALIGNMENT**



REPLICATION - SPECIFICS

F



= TOPOISOMERASE

= HELICASE

= BINDING PROTEINS

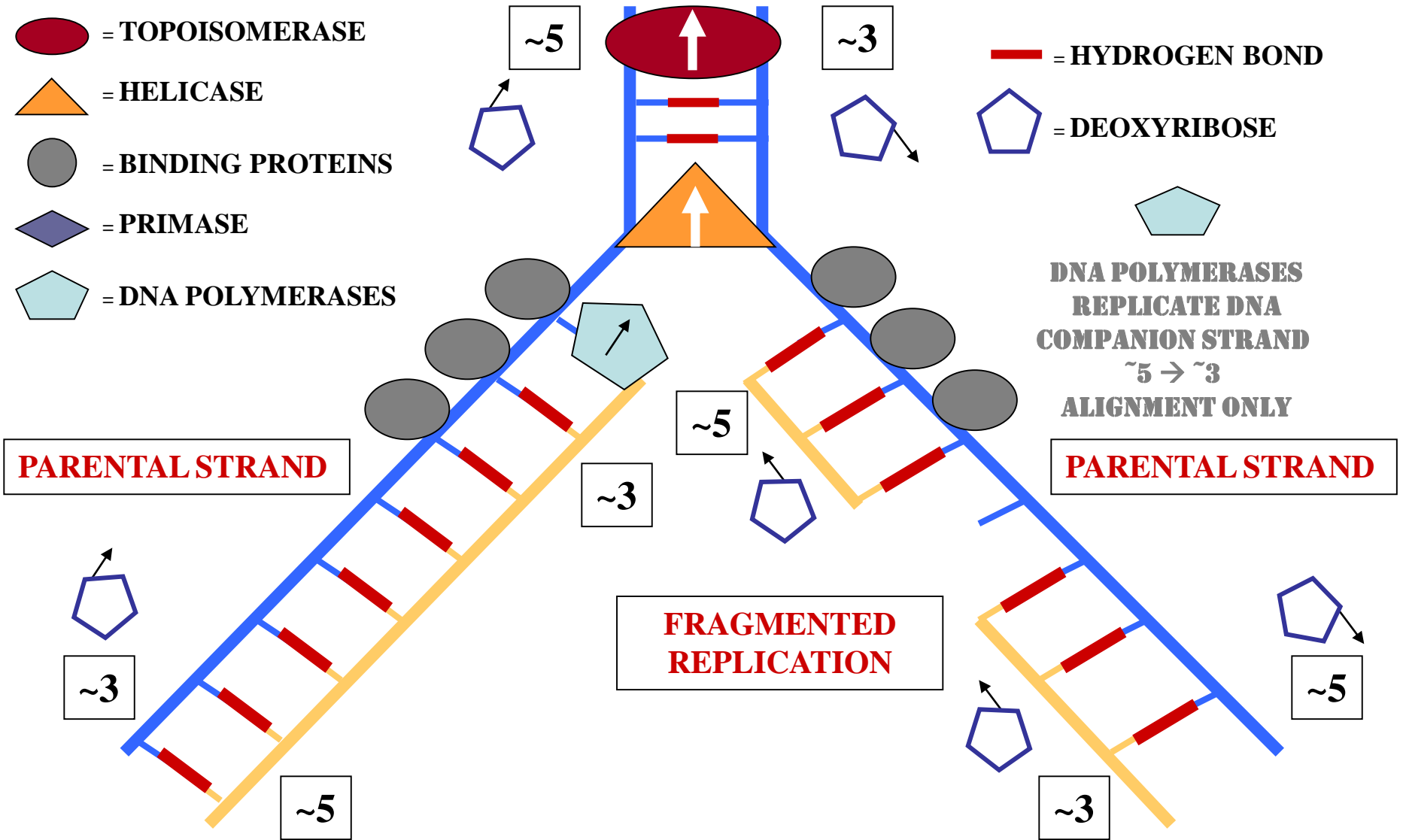
= PRIMASE

= DNA POLYMERASES

= HYDROGEN BOND

= DEOXYRIBOSE

**DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY**



PARENTAL STRAND

PARENTAL STRAND

**FRAGMENTED
REPLICATION**

~3

~5

~3

~5





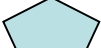
~5

~3

~5


~3

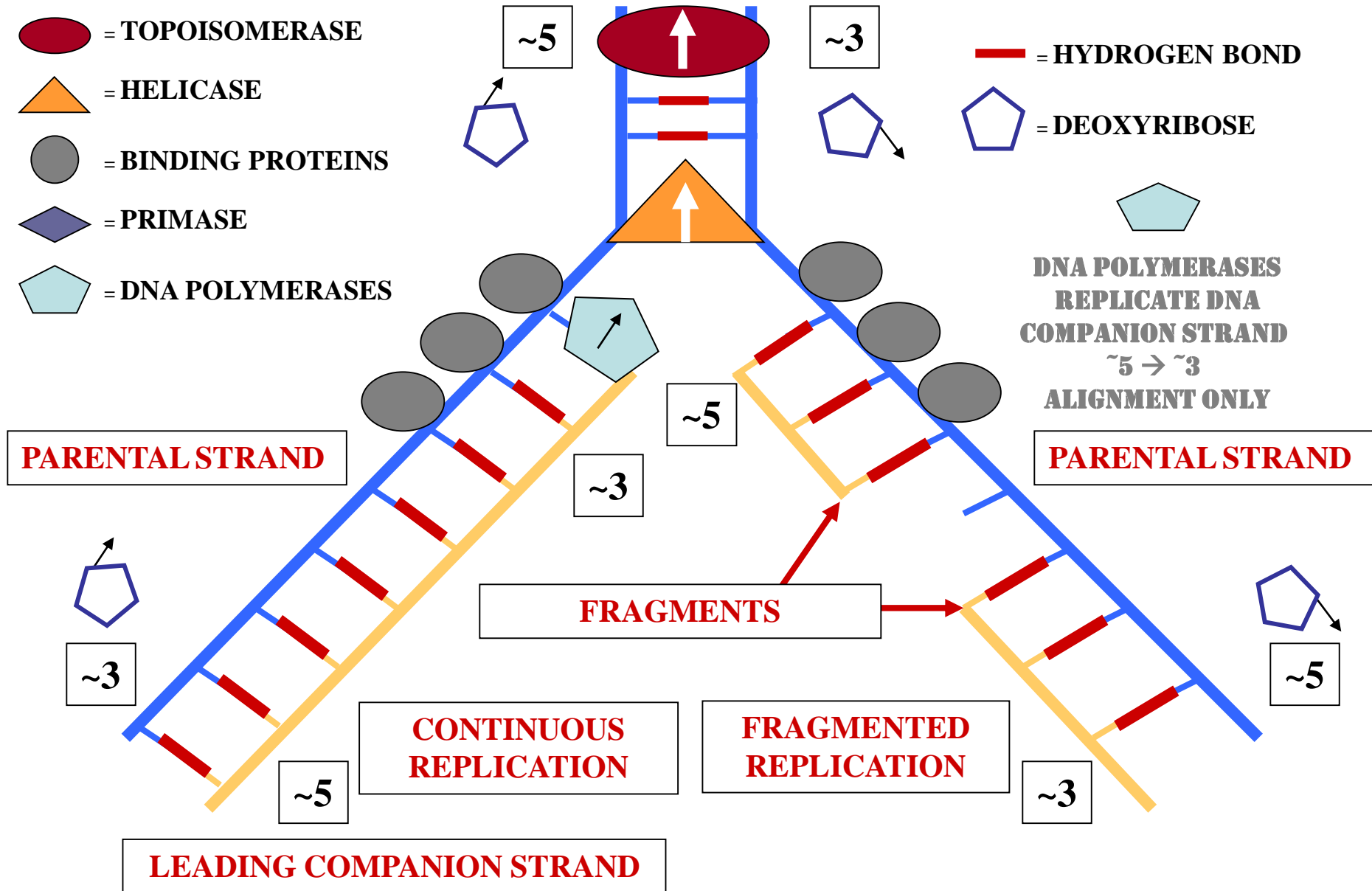
REPLICATION - SPECIFICS

-  = TOPOISOMERASE
-  = HELICASE
-  = BINDING PROTEINS
-  = PRIMASE
-  = DNA POLYMERASES

 = HYDROGEN BOND

 = DEOXYRIBOSE


DNA POLYMERASES
REPLICATE DNA
COMPANION STRAND
~5 → ~3
ALIGNMENT ONLY



PARENTAL STRAND

PARENTAL STRAND

FRAGMENTS

**CONTINUOUS
REPLICATION**

**FRAGMENTED
REPLICATION**

LEADING COMPANION STRAND