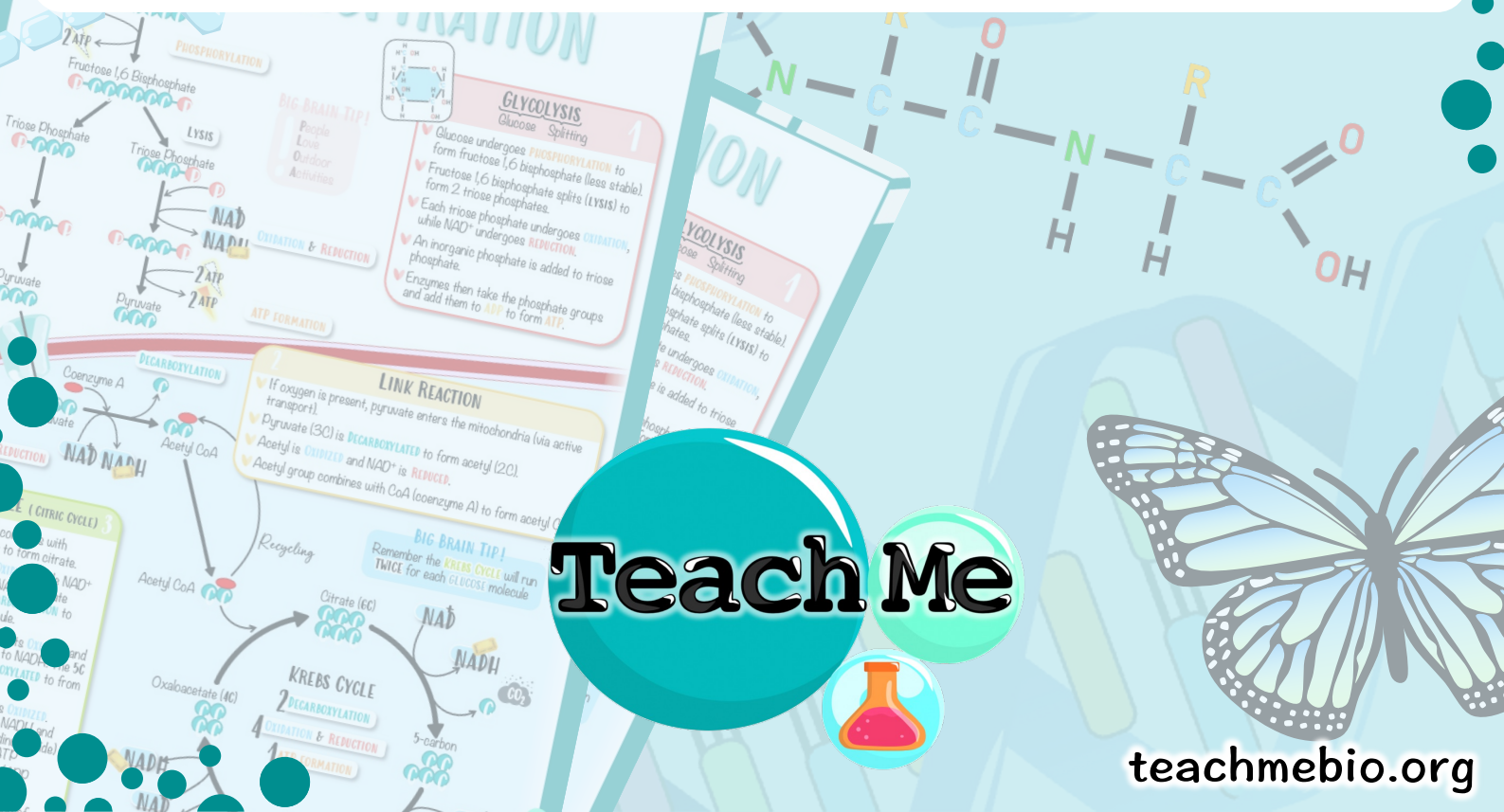


TeachMe

STUDY NOTES

CHAPTER 6 – NUCLEIC ACIDS & PROTEIN SYNTHESIS MUTATIONS



MUTATIONS

MUTATIONS – When one or more nucleotides (A, C, T, or G) of a DNA code are modified by mistake; may involve entire segments and even full chromosomes.

I. SUBSTITUTIONS

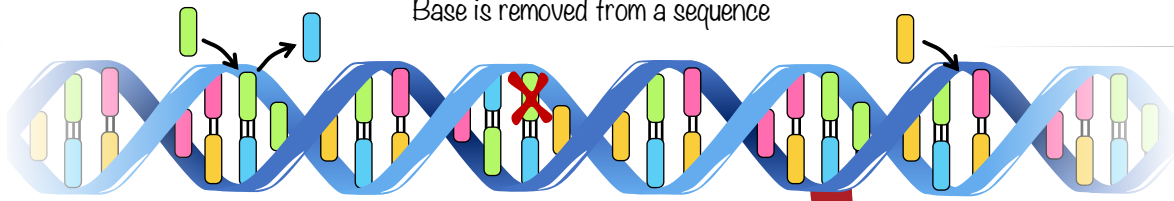
One base is changed for another

II. DELETIONS

Base is removed from a sequence

III. INSERTIONS

Base is added to a sequence

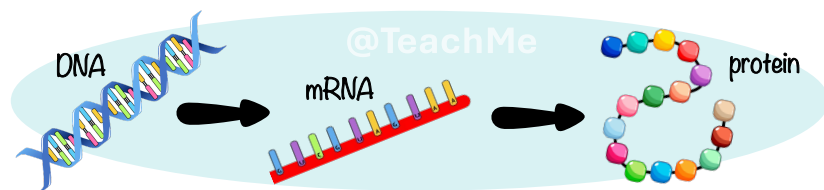


ANALOGY FOR TYPES OF MUTATIONS

THE DOG ATE THE CAT	[Normal]
THE H OG ATE THE R AT	[Substitution]
THE DOG ATE THE BA D CAT	[Insertion]
A TH EDO GAT ETH ECA T _ _	[Insertion] Frameshift (see page 4)
H ED OGA TET HEG AT _	[Deletion]

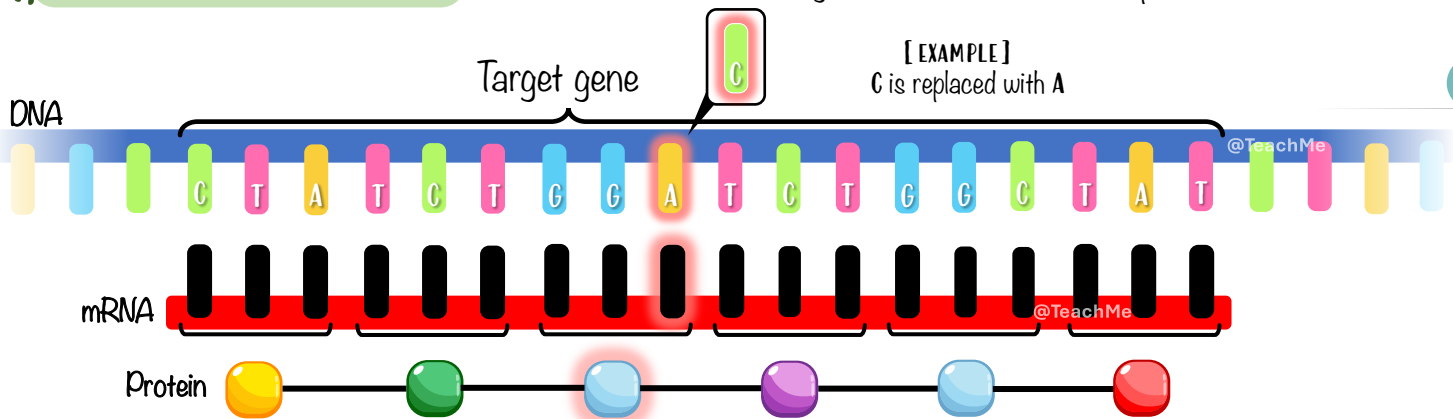
GOOD ← NEUTRAL → BAD

A mutation can further affect downstream processes leading to mutated mRNA and mutated (abnormal) proteins. These may further have effect on the body which may be **GOOD**, **NEUTRAL** or **BAD**.



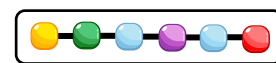
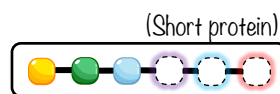
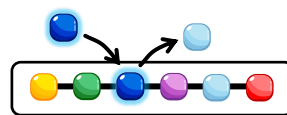
I. BASE SUBSTITUTION MUTATIONS

A mutation that results in a single base alteration: a base is replaced with another one.



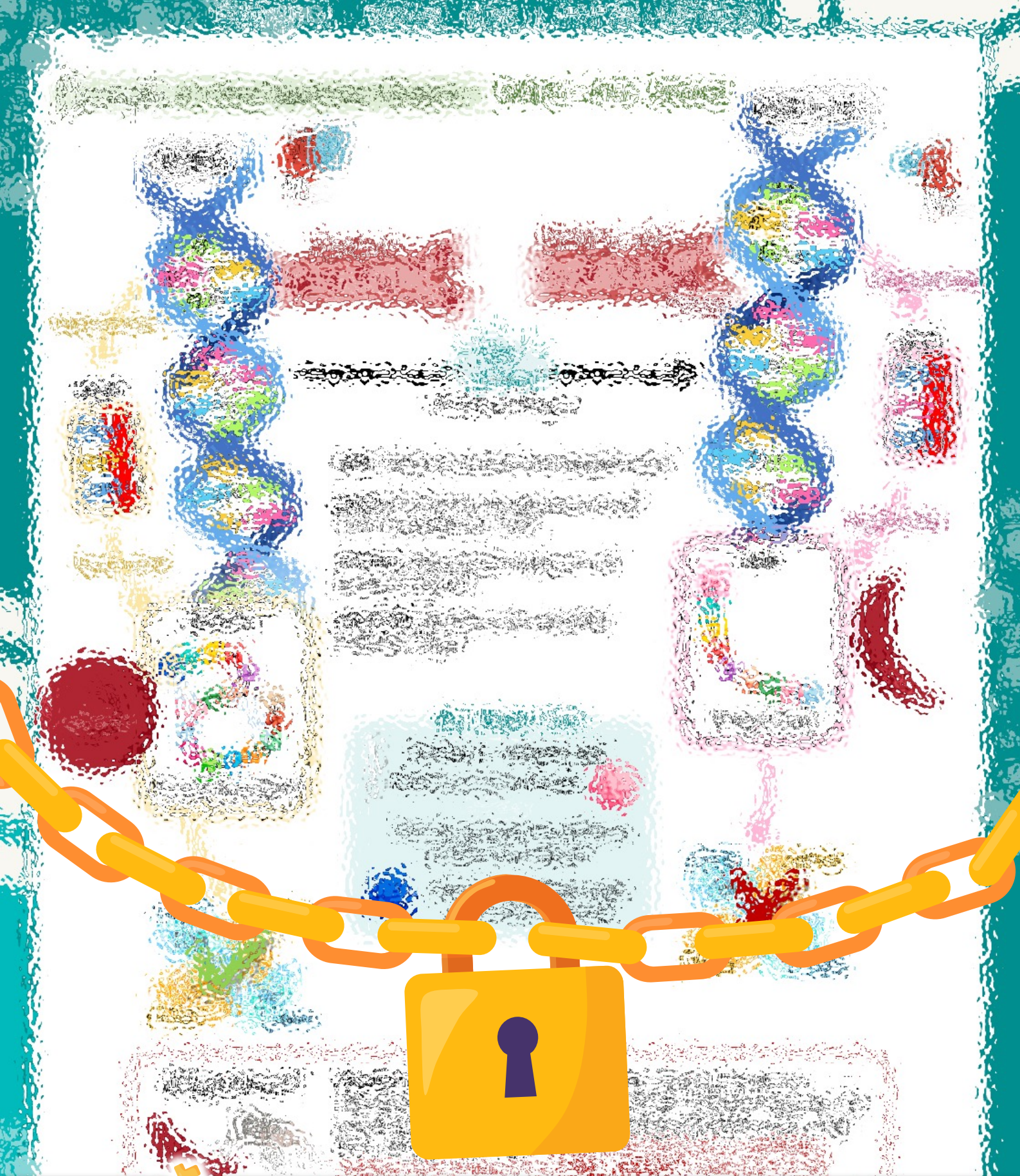
Possible outcomes: (in coding regions)

- AMINO ACID CHANGE**
 - Missense mutation**
When a **DIFFERENT AA** is coded* for.
 - Nonsense mutation**
When a **STOP CODON** is coded for. Cut of gene translation. Resulting in non-functional protein being made.
- NO AMINO ACID CHANGE**
 - Same sense (Silent/Neutral) mutation**
Sometimes a change in the sequence leads to **NO ALTERATION** in amino acid sequence because of the **DEGENERATE** nature of the DNA code.

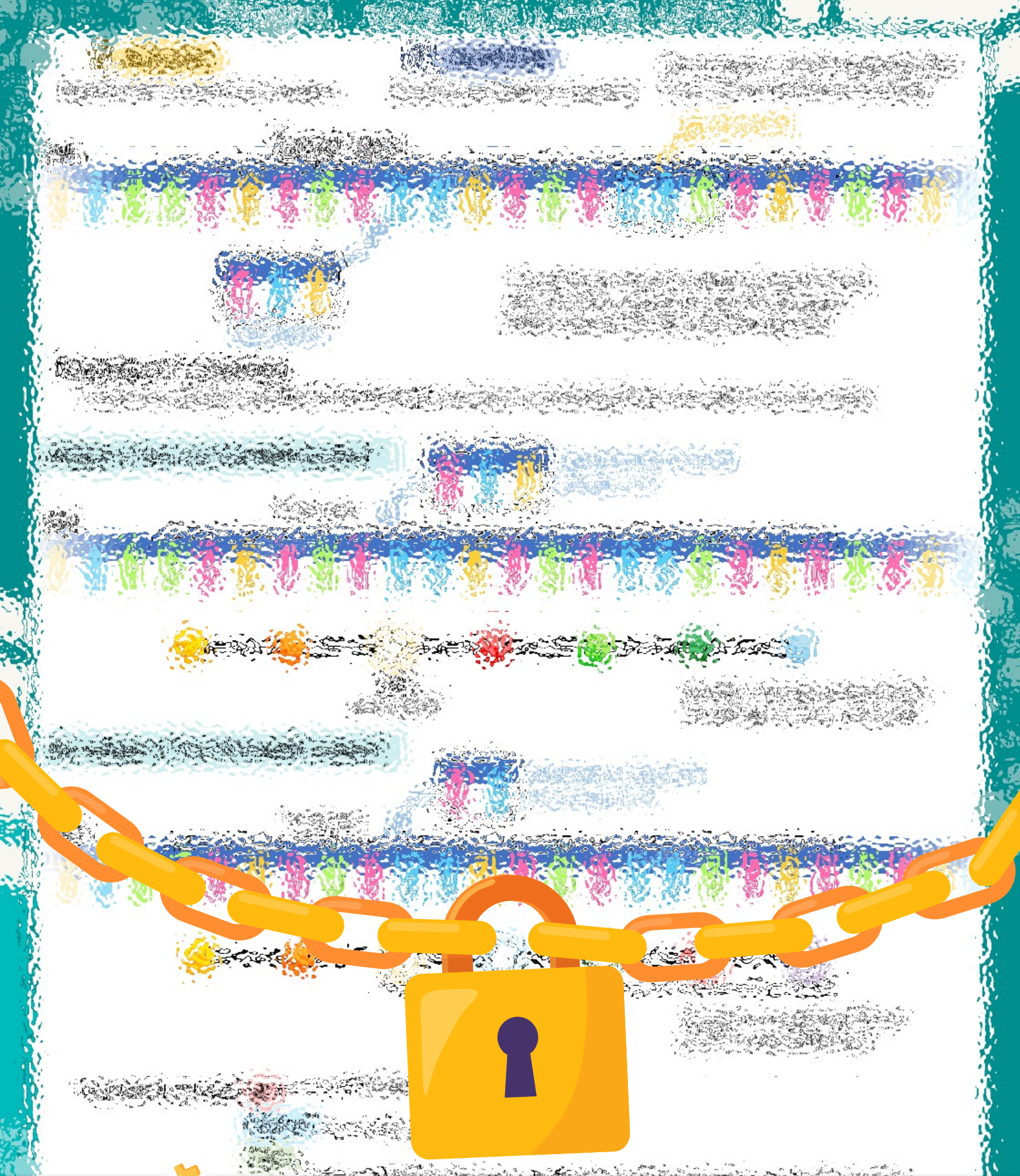


A variation in a single base pair in the DNA sequence:

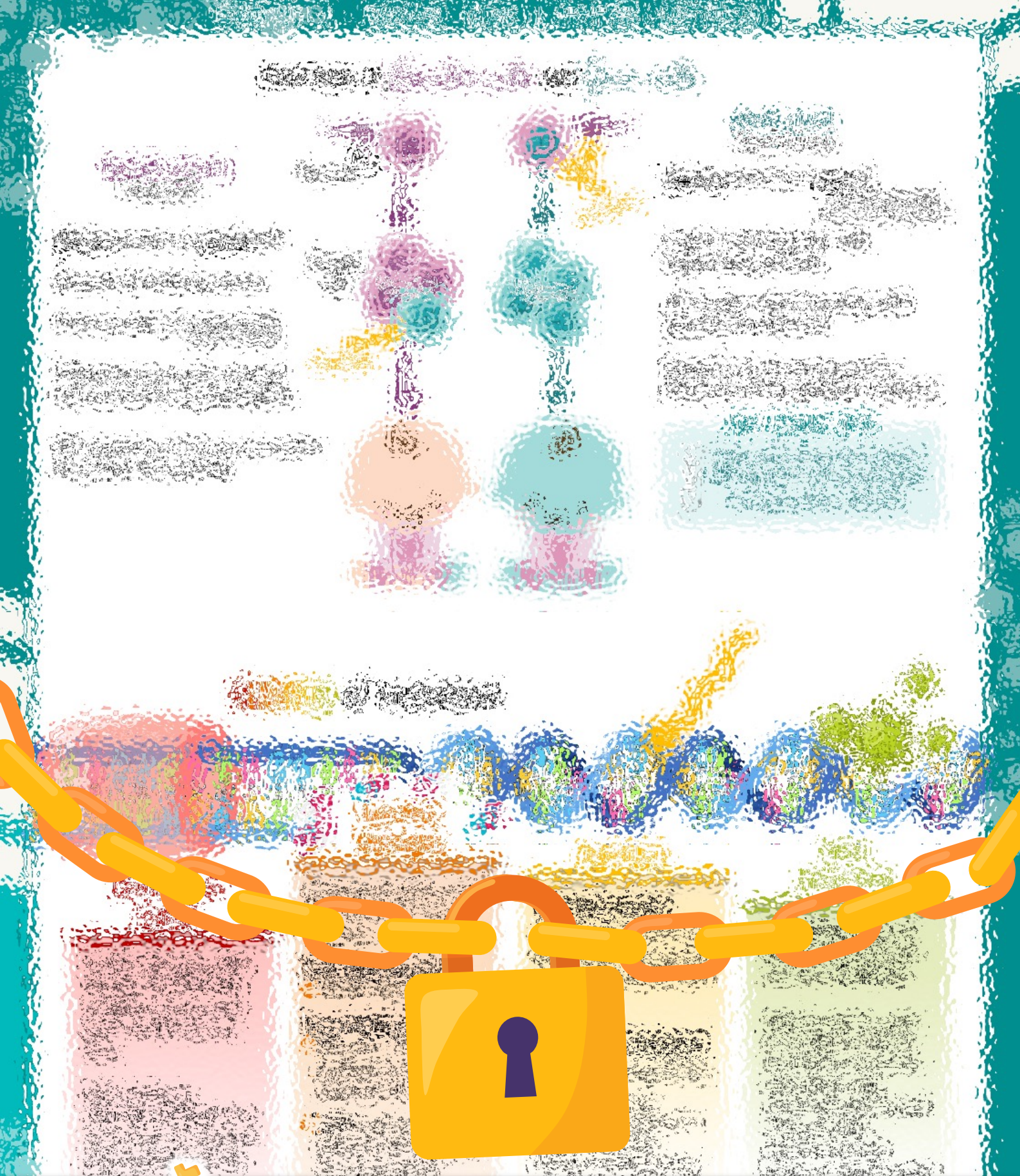
SINGLE NUCLEOTIDE POLYMORPHISM (SNPs)



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