Genomics Notes

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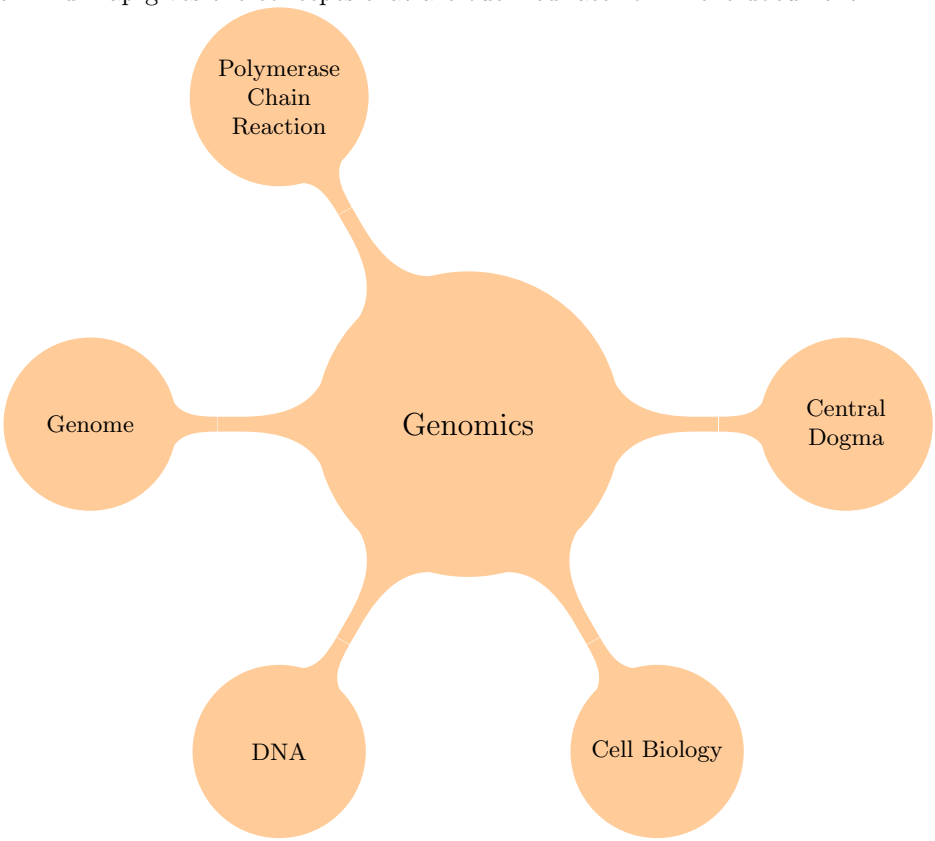
1 Overview

The mind map gives the concepts that are outlined later on in the document



2 Central Dogma

- DNA gets transcripted to RNA
- RNA gets translated to protiens

3 Cell Biology

- Eukaryotes : cells with nucleus. DNA is in the nucleus
- Prokaryotes : cells without nucleus
- Diploid: two copies of every chromosome, and then X,Y chromosomes
- Mitosis: process of cell dividing into 2 cells

- Meiosis: crossing over of chromosomes from the father and mother to create child's chromosome

4 DNA

- Chromosomes are DNA molecues glued by something called histone
- DNA has the genetic material passed on from generations
- Adenine and Guanine are prunies with two ring structure
- Thymine and Cytosine are pyrimidines, with single ring
- In double helix structure, A binds to T and G binds to C
- A,G,T,C are called nucleotides
- RNA is single strand and Thymine is replaced by Uracil
- Three RNA nucleotides get translated to one protien amino acid

5 Genome

- All the nucleotide sequences including Exons and Introns
- Exons are DNA sequenes that get transcripted to RNA
- Introns are skipped during RNA making
- Introns can have tandem repeats
- Genotype is collection of sequence of genes
- Phenotype is observed trait

6 Ploymerase Chain Reaction

- A way to make many copies of DNA
- Suppose there is a strand of DNA we want to replicate
- The beginning and end of that sequence, we take a primer molecule which is a few bases long
- Then there are lot of nucleotides put in the mixture
- And then there is DNA polymerase molecule

- The mixture is first heated and then DNA strands gets seperated Then mixture is allowed to cool and then primers attach themsleves to these strands Primers are the complement of the starnd beginning and end we want to replicate Then the DNA polymerase looks at the DNA that has incomplete double strand - which will be in between the places where the primers got attached The DNA polymerase will take the floating nucleotides and bind it to single strand and complete the DNA seqeunce The cycle is repeated, each cycle the aount doubles