Key Takeaways of the course 3, chapter III

Three-Point Test

- **Purpose**: Determine the relative positions of three genes on the same chromosome (gene mapping) and calculate the recombination frequencies.
- **Key Points**:
  - Identify parental, single crossover, and double crossover gametes based on their frequencies.
  - The **gene in the middle** is determined by comparing parental and double crossover gametes.
  - Calculate distances between genes in centiMorgans (cM) using recombination frequencies.
  - **Interference**: The occurrence of one crossover event can reduce the likelihood of another nearby.
- **Significance**: Provides a detailed understanding of gene positions and interactions on a chromosome.

Epistasis

- **Definition**: Interaction between genes where one gene's expression masks or modifies the expression of another gene.
- **Key Types**:
  - **Recessive Epistasis**: A recessive allele at one locus masks the effect of alleles at another locus (9:3:4 ratio).
  - **Dominant Epistasis**: A dominant allele at one locus masks alleles at another locus (12:3:1 ratio).
- **Significance**: Explains deviations from Mendel's ratios and demonstrates the complexity of genetic interactions.

Sex-Linked Inheritance

- **X-Linked Recessive Traits**:
  - Common in males due to their single X chromosome (e.g., color blindness, hemophilia).
  - Females are carriers unless they inherit the trait from both parents.
- **X-Linked Dominant Traits**:
  - Affects both sexes but is more severe in males (e.g., Rett syndrome).
- **Significance**: Highlights unique inheritance patterns linked to sex chromosomes and their implications in breeding and health.