

Oklahoma School of Science and Mathematics
Lecture Outline
Genetics
Second Exam

Structure of DNA

- Nucleosome
- Histone Proteins
- Nucleosome DNA
- Linker DNA
- Super Coil

Topology

- Arm Length
- Banding Patterns
- Polytene Chromosome
- Heterochromatin
- Euchromatin
- Centromere Location

Linkage

Gene Family

DNA replication

- Helicase
- Gyrase
- Polymerase
- Ligase
- Replication fork
- Semi-conservative
- Meselson and Stahl

Transcription

- RNA from DNA
- Bubble
- TATA Box
- Cap/tail
- Exons
- Introns
- RNA Polymerase
- Ligase
- Code

Translation

- MRNA to protein
- Ribosome
- Large/small subunit
- A/P/E/ sites
- Peptidyl Transferase
- Stop codons
- Anti-codons
- Amino acids
- Wobble effect

Linkage/recombination 2

- Map units
- Using the % recombination to map out the distances
- Chi-Square analysis
- $(o-e)^2/e \quad \Sigma$ to get value
- Degree of Freedom
- Table of critical values
- Tri hybrid crosses
- Mapping using knockouts
- Other molecular techniques

Gene Regulation

- Prokaryote
 - E. coli* lac operon
- Eukaryote
 - X inactivation
 - Imprinting
 - Heterochromatin