

Chapter 15

Class notes
(Concepts 15.1, 15.3, 15.4)

I. Work of Geneticists and Cytologists in the late 1800's and early 1900's

- **Rediscovered Mendel's Principles**
- **Proposed that Mendel's inheritable factors (genes) are located on chromosomes.**

II. Thomas Hunt Morgan

- **Major contributions include:**
 - A.
 - B.
 - C.

II. Thomas Hunt Morgan

A. *Drosophila melanogaster* (fruit flies)

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II. Thomas Hunt Morgan

B. Morgan's symbols

Wild type (+) =

Mutant =

(2 slides)

II. Thomas Hunt Morgan

B. **NOTE THAT Morgan's symbols in the case of a dominant allele.**

C. Wild type (+) =

Mutant =

Question 15.1

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II. Thomas Hunt Morgan

C. Inheritance of sex-linked genes in fruit flies.

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The undergraduate Calvin Bridges discovered a male fruit fly with *white* eyes in Morgan's lab.

II. Thomas Hunt Morgan

P generation =
red-eyed female X white-eyed male

F1 generation = All offspring had red eyes

– *Conclusion:*

II. Thomas Hunt Morgan

F1 generation =
red-eyed female X red-eyed male

F2 generation =
– All females had red eyes
– ½ males red; ½ white

– **Conclusion:**

III. Inheritance of Sex-Linked Genes

- Mammals use the X-Y system
- Y Chromosome in Humans
 - A.
 - B.
 - C.

IV. Sex-Linked Disorders in Humans

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Question 15.2

- A.
B.

Alleles

X = wild type

X^{cb} = R-G colorblindness

V. Alteration in chromosome number or structure.

- A. Nondisjunction-changes in chromosome number
- B. Breakage- changes in chromosome structure.

V. Alteration in chromosome number or structure.

A. Nondisjunction in *Meiosis*

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V. Alteration in chromosome number or structure.

- **Aneuploidy** = Fertilization of an abnormal gamete with a normal gamete.

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V. Alteration in chromosome number or structure.

- **Some non-lethal alternations in chrom #.**

➤ **Turner's syndrome (XO) –**

➤ **Klinefelter's syndrome (XXY)-**

➤ **Down syndrome;**

V. Alteration in chromosome number or structure.

B. Alterations due to breakage include...

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- **Example:**

Question 15.3

- Use the sentence, THECATATETHERAT to answer this question.

VI. Another interesting observation:
X inactivation in females.

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VII. Sex inheritance in other species.

- Mammals = X-Y system
- Grasshoppers and Cockroaches = X-O system
- Birds and Fish = Z-Y system
- Bees = Haplo-diploid system

Question 5.4

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