
Cell growth, repair, and replacement of lost or damaged cells.
Asexual Reproduction VS. Sexual Reproduction

Asexual Reproduction: bacteria undergoing binary fission (genetically identical)

Sexual Reproduction: eukaryotic organism with offspring (not genetically identical)

Binary Fission

Components of the Chromosome

The Eukaryotic Cell Cycle and Mitosis
The Eukaryotic Cell Cycle

The Eukaryotic Mitotic Phase

Growth factors signal and cell cycle control system
Meiosis and Crossing Over

Diploid Cell
(Germ Cell)

Haploid Cell
(Sperm or Egg Cell)

Meiosis I

Interphase

Prophase I

Metaphase I

Anaphase I

Meiosis II

Prophase II

Metaphase II

Anaphase II

Telophase II and Cytokinesis

* Telophase I and Cytokinesis

* Telophase II and Cytokinesis

* still considered Meiosis I
CROSSING OVER

Tetrad

Chiasma

Centromere

CROSSING OVER (CONT.)

Coat-color genes

Eye-color genes

Tetrad (homologous pair of chromosomes in synapsis)

Breakage of homologous chromatids

Joining of homologous chromatids

Chiasma

CROSSING OVER (CONT.)

Chiasma

Separation of homologous chromosomes at anaphase I

Separation of chromatids at anaphase II and completion of meiosis

Parental type of chromosome

Recombinant chromosome

Recombinant chromosome

Parental type of chromosome

Genomes of four genetic types
Karyotype

Sex chromosomes

Nondisjunction

Abnormal Numbers of Sex Chromosomes

<table>
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<tr>
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<tbody>
<tr>
<td>Sex Chromosomes</td>
<td>Syndrome</td>
</tr>
<tr>
<td>XXY</td>
<td>Klinefelter syndrome (male)</td>
</tr>
<tr>
<td>XXY</td>
<td>None (normal male)</td>
</tr>
<tr>
<td>XXX</td>
<td>None (normal female)</td>
</tr>
<tr>
<td>XO</td>
<td>Turner syndrome (female)</td>
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</tbody>
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