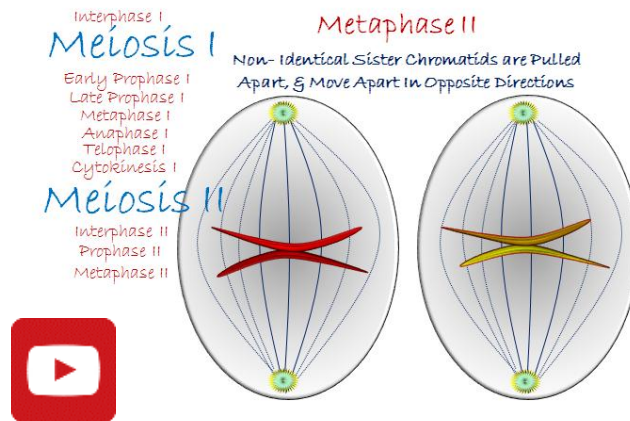


Meiosis

(Continuing Medical Education)



For more details, see the linked video.

In preparation for cell division, cell enters a preparatory phase, which is the Interphase I.

Interphase I:

- 1- The centromere duplicates.
- 2- The chromatids duplicate. The two sister chromatids form together one duplicated chromosome.

Then, the cell enters the phases of meiosis I, according to the following sequence:

Meiosis I:

1) The Early Prophase I:

- The mitotic spindle starts to form.
- The chromatids start to condense. In this stage, the chromosomes become easily seen in microscope. Every chromosome contains two identical sister chromatids. For this reason, the chromosome is called duplicated chromosome.
- The nucleolus disappears.

2) The Late Prophase I:

- The nuclear envelope dissolves away, thus liberating the chromosomes.
- The mitotic apparatus reaches full maturity.
- The chromosomes condense into X-shaped structures and become more and more easily seen in microscope.

- The homologous chromosomes pair up. The term "homologous chromosomes" designates two different chromosomes, of which one is from the father and the second is from the mother.

- The paired homologous chromosomes exchange some of their DNA. Therefore, it is from this phase on, the two sister chromatids of each chromosome become no longer identical.

3) The Metaphase I:

- The metaphase plate is built up at the equator of cell;

- The paired homologous chromosomes line up at the metaphase plate.

4) The Anaphase I:

- The homologous chromosomes are pulled apart, and move apart to the opposite poles of cell. Each chromosome still has two non- identical sister chromatids, and is still called duplicated chromosome.

5) The Telophase I:

- The mitotic apparatus disappears completely.

- The nucleoli reappear.

- The chromatids start to decondense (optional according to the organism).

- The nuclear envelopes reappear (optional according to the organism).

6) The Cytokinesis I:

- The cell pinches in the middle, and an acting constricting ring is built up.

- It starts earlier in the telophase.

- At the end of Cytokinesis I, two non- identical daughter cells are obtained.

**Then, the Two daughter cells enter the process of meiosis II,
according to the same sequence as meiosis I:**

Meiosis II:

1) The Interphase II:

- The centromere duplicates (sometimes, the centrosome does not duplicate. However, its two centrioles separate and play the role of two centrosomes).

- N.B. The chromatids Do Not duplicate.

2) Prophase II:

- The chromatids condense.

- The nucleoli disappear.

- The nuclear envelopes dissolve away, thus liberating the chromosomes.

- The mitotic spindles reach full maturity.

- The chromosomes condense into X- shaped structures and become easily seen

in microscope. The chromosome still contains two chromatids; and are therefore still called duplicated chromosome.

3) The Metaphase II:

- *The metaphase plate is built up at the equator of each cell;*
- *The non- identical sister chromatids line up at the metaphase plate.*

4) The Anaphase II:

- *The non- identical sister chromatids are pulled apart, and move apart to the opposite poles of cell. Hence, each chromosome will only have one chromatid; it is therefore called single (haploid) chromosome.*

5) The Telophase II:

- *The mitotic spindles disappear completely.*
- *The nucleoli reappear.*
- *The chromatids start to decondense.*
- *The nuclear envelopes reappear.*

6) The Cytokinesis II:

- *The two cells pinche in the middle, and an acting constricting ring is built up in the equator of every cell.*
- *It might start earlier, i.e. in the telophase II, or it may come after it.*
- *At the end of the Cytokinesis II, four non- identical daughter cells are obtained. Each daughter cell has the half quantity of mother cell's DNA.*

In another context, one can read:

- *Neural Conduction, Personal View vs. International View (Innovated)*

- *Upper Motor Neuron Lesions, Pathophysiology of Symptomatology*



Neural Conduction, Action Pressure Waves (Innovated)



Neural Conduction, Action Potentials (Innovated)



Neural Conduction, Action Electrical Currents (Innovated)



The Function of Action Potentials (Innovated)



The Three Phases of Neural Conduction



Neural Conduction in the Synapse (Innovated)



Sensory Receptors

- *Nodes of Ranvier, the Equalizers (Innovated)*



Nodes of Ranvier, the Functions (Innovated)



Nodes of Ranvier, Function N1 (Innovated)



Nodes of Ranvier, Function N2 (Innovated)



Nodes of Ranvier, Function N3 (Innovated)

- *The Philosophy of Pain, Pain Comes First! (Innovated)*
- *The Philosophy of Form (Innovated)*
- *Spinal Injury, Pathophysiology of Spinal Shock, Pathophysiology of Hyperreflexia*



Spinal Shock (Innovated)



The Clonus (Innovated)



Hyperactivity Hyperreflexia (Innovated)



Hyperreflexia, Extended Sector of Reflex



Hyperreflexia, Bilateral Responses



Hyperreflexia, Multiple Responses

- *Nerve Conduction Study, Wrong Hypothesis is the Origin of Misinterpretation (Innovated)*



Wallerian Degeneration (Innovated)



Neural Regeneration (Innovated)

- *Wallerian Degeneration Attacks Motor Axons, While Avoids Sensory Axons*



Barr Body, the Whole Story (Innovated)



Boy or Girl, Mother Decides!



Adam's Rib and Adam's Apple, Two Faces of one Sin



The Black Hole is a (the) Falling Star?



Adam's Rib, could be the Original Sin?

-  [*Pronator Teres Syndrome, Struthers Like Ligament \(Innovated\)*](#)
-  [*Function of Standard Action Potentials & Currents*](#)
-  [*Posterior Interosseous Nerve Syndrome*](#)
-  [*Spinal Reflex, New Hypothesis of Physiology*](#)
-  [*Hyperreflexia, Innovated Pathophysiology*](#)
-  [*Clonus, 1st Hypothesis of Pathophysiology*](#)
-  [*Clonus, 2nd Hypothesis of Pathophysiology*](#)
-  [*Clonus, Two Hypotheses of Pathophysiology*](#)
-  [*Hyperreflexia \(1\), Pathophysiology of Hyperactivity*](#)
-  [*Hyperreflexia \(2\), Pathophysiology of bilateral Responses*](#)
-  [*Hyperreflexia \(3\), Pathophysiology of Extended Hyperreflex*](#)
-  [*Hyperreflexia \(4\), Pathophysiology of Multi-Response Hyperreflex*](#)
-  [*Barr Body, the Second Look*](#)

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