



General Embryology

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1. Which of the following is a major characteristic of meiosis I?

- (A) Splitting of the centromere
- (B) Pairing of homologous chromosomes
- (C) Reducing the amount of DNA to 1N
- (D) Achieving the diploid number of chromosomes
- (E) Producing primordial germ cells

2. A normal somatic cell contains a total of 46 chromosomes. What is the normal complement of chromosomes found in a sperm?

- (A) 22 autosomes plus a sex chromosome
- (B) 23 autosomes plus a sex chromosome
- (C) 22 autosomes
- (D) 23 autosomes
- (E) 23 paired autosomes

3. Which of the following describes the number of chromosomes and amount of DNA in a gamete?

- (A) 46 chromosomes, 1N
- (B) 46 chromosomes, 2N
- (C) 23 chromosomes, 1N
- (D) 23 chromosomes, 2N
- (E) 23 chromosomes, 4N

4. Which of the following chromosome compositions in a sperm normally results in the production of a genetic female if fertilization occurs?

- (A) 23 homologous pairs of chromosomes
- (B) 22 homologous pairs of chromosomes
- (C) 23 autosomes plus an X chromosome
- (D) 22 autosomes plus a Y chromosome
- (E) 22 autosomes plus an X chromosome

5. In the process of meiosis, DNA replication of each chromosome occurs, forming a structure consisting of two sister chromatids attached to a single centromere. What is this structure?

- (A) A duplicated chromosome
- (B) Two chromosomes
- (C) A synapsed chromosome
- (D) A crossover chromosome
- (E) A homologous pair

6. During meiosis, pairing of homologous chromosomes occurs, which permits large segments of DNA to be exchanged. What is this process called?

- (A) Synapsis
- (B) Nondisjunction
- (C) Alignment
- (D) Crossing over
- (E) Disjunction

Answers and Explanations

1. **B.** Pairing of homologous chromosomes (synapsis) is a unique event that occurs only during meiosis I in the production of gametes. Synapsis is necessary so that crossing over can occur.

2. **A.** A normal gamete (sperm in this case) contains 23 single chromosomes. These 23 chromosomes consist of 22 autosomes plus 1 sex chromosome.

3. **C.** Gametes contain 23 chromosomes and 1N amount of DNA, so that when two gametes fuse at fertilization, a zygote containing 46 chromosomes and 2N amount of DNA is formed.

4. **E.** A sperm contains 22 autosomes and 1 sex chromosome. The sex chromosome in sperm may be either the X chromosome or the Y chromosome. The sex chromosome in a secondary oocyte is only the X chromosome. If an X-bearing sperm fertilizes a secondary oocyte, a genetic female (XX) is produced. Therefore, sperm is the arbiter of sex determination.

5. **A.** The structure formed is a duplicated chromosome. DNA replication occurs, so that the amount of DNA is doubled ($2 \times 2N = 4N$). However, the chromatids remain attached to the centromere, forming a duplicated chromosome.

6. **D.** Synapsis (pairing of homologous chromosomes) is a unique event that occurs only during meiosis I in the production of gametes. Synapsis is necessary so that crossing over, whereby large segments of DNA are exchanged, can occur.

1-The two chromosomes that make up each pair in somatic are called

1-sister chromosome

2-homologous chromosomes

3-replecated chromosomes

4-genes

A:2

2-HOMOLOGOUS CHROMOSOMES generally they look very similar except

1-when the DNA replicate

2-when the DNA start packing itself

3- sex chromosomes in male

A:3

3-HOW MANY HOMOLOGOUS CHROMOSOMES is in the somatic cell of male human?

1-22

2-23

3-46

4-92

A:1

4- The monad form consists of

1- 2 identical chromatids

(sister chromatids) attached together at the centromere

2- a single chromatid, a single piece of DNA containing a

centromere and telomeres at the ends

3- CHIASMATA: X- shaped structure

A:2

5-Sex chromosomes in males are NOT homologous:

- A. True
- B. False

Answer: A

6-An example of Cells that are said to in the G₀ phase are:

- A. Glandular cells
- B. Muscle cells
- C. Bone cells
- D. Nerve cells

Answer: D

7-During the period of interphase, enzymes and proteins and centrosomes replicated in the:

- A. G₁ phase
- B. S phase
- C. G₂ phase
- D. Metaphase

Answer: C

8-During the period of interphase, centrosome replication is completed in the:

- A. G₁ phase
- B. S phase
- C. G₂ phase
- D. Metaphase

Answer: C

9-Somatic cells that are not dividing, have chromosomes that are:

- A. $2n$, double structured
- B. $1n$, single structured
- C. $2n$, single structured
- D. $1n$, double structured

Answer: C

10-The process of synapsis between chromosomes happens in:

- A. Leptoten
- B. Pachytene
- C. Zygotene
- D. Diplotene

Answer: C

Good wishes