What is Fertilization and Embryonic Development?

Worksheet

Fertilization occurs when a sperm fuses with an egg in the fallopian tube to form a diploid zygote, which then divides through cleavage, forms a blastocyst, implants in the uterus, and develops three germ layers during gastrulation.

Questions

1. Where does fertilization normally occur?

A) Uterus
B) Ovary
C) Fallopian tube
D) Cervix

2. What structure prevents polyspermy?

A) Acrosome reaction
B) Cortical reaction
C) Cleavage
D) Implantation

3. What does the trophoblast become?

A) The embryo
B) The placenta
C) The zygote
D) Amniotic fluid

4. Which germ layer gives rise to the nervous system?

A) Endoderm
B) Mesoderm
C) Ectoderm
D) Trophoblast

5. Trace the stages a fertilized egg passes through before implantation.

6. Explain the fate of the three germ layers formed during gastrulation.

7. Explain why a pregnancy test can detect pregnancy soon after implantation.

8. Define: What is fertilization?

9. Define: What is cleavage?

10. Define: What is a blastocyst?

Answer Key

1. C) Fallopian tube - Sperm and egg typically fuse in the ampulla of the fallopian tube.

2. B) Cortical reaction - The cortical reaction alters the egg's surface to block additional sperm from entering.

3. B) The placenta - The trophoblast layer of the blastocyst develops into the placenta.

4. C) Ectoderm - Ectoderm forms the skin and the entire nervous system.

5. Sperm and egg fuse in the fallopian tube to form a zygote The zygote undergoes cleavage, dividing into a morula The morula develops into a blastocyst with an inner cell mass and trophoblast Around day 6-10, the blastocyst implants into the endometrium

6. Ectoderm develops into skin and the nervous system Mesoderm develops into muscle, bone, and the circulatory system Endoderm develops into the linings of the digestive and respiratory tracts All organs of the body originate from one of these three layers

7. After implantation, the trophoblast begins secreting hCG hCG keeps the corpus luteum active, maintaining progesterone levels Progesterone keeps the endometrium intact instead of shedding hCG is excreted in urine, which is what pregnancy tests detect

8. The fusion of sperm and egg to form a diploid zygote.

9. Rapid mitotic divisions of the zygote without an increase in overall size.

10. A fluid-filled ball of cells with an inner cell mass and trophoblast, formed by day 5-6.