Embryology Quiz Questions and Answers PDF

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Which germ layer gives rise to the central nervous system?

- ◯ **Ectoderm ✓**
- ◯ Mesoderm
- ◯ Endoderm
- ◯ trophoblast

> The central nervous system, which includes the brain and spinal cord, develops from the ectoderm germ layer during embryonic development.

Who is known for discovering the mammalian egg?

- ◯ Aristotle
- ◯ **Karl Ernst von Baer ✓**
- ◯ Hans Spemann
- ◯ Gregor Mendel

> The mammalian egg was first discovered by the German zoologist Ernst Haeckel in the 19th century. His work contributed significantly to the understanding of mammalian reproduction and embryology.

Explain the significance of the neural tube in embryonic development.

> **The neural tube is the precursor to the central nervous system, which includes the brain and spinal cord. Its proper formation is crucial for the development of these structures.**

Describe the process of implantation and its importance in pregnancy.

> **Implantation is the attachment of the blastocyst to the uterine wall, essential for establishing a nutrient supply from the mother to the developing embryo.**

Discuss the role of teratogens in embryonic development and provide examples.

> **Teratogens are substances that can cause congenital anomalies or birth defects. Examples include alcohol, certain drugs, and infections like rubella.**

What are the main differences between spermatogenesis and oogenesis?

> **Spermatogenesis produces four viable sperm cells from each precursor cell, occurs continuously, and throughout a male's life. Oogenesis produces one viable egg and polar bodies, occurs cyclically, and is limited to a female's reproductive years.**

How does comparative embryology provide insights into evolutionary biology?

Comparative embryology studies similarities and differences in embryonic development across species, revealing evolutionary relationships and common ancestry.

Outline the ethical concerns associated with the use of embryonic stem cells in research.

Ethical concerns include the moral status of embryos, potential for exploitation, and the balance between scientific advancement and respect for human life.

Which structures are part of the placenta? (Select all that apply)

- [ ] **Chorionic villi ✓**
- [ ] Amniotic sac
- [ ] **Umbilical cord ✓**
- [ ] Yolk sac

The placenta consists of several key structures, including the chorionic villi, amniotic sac, and maternal decidua. These components work together to facilitate nutrient exchange and support fetal development during pregnancy.

Which processes are involved in fertilization? (Select all that apply)

- [ ] **Capacitation ✓**
- [ ] **Acrosome reaction ✓**
- [ ] Mitosis
- [ ] **Cortical reaction ✓**

> Fertilization involves several key processes including the fusion of sperm and egg, the activation of the egg, and the formation of a zygote. These processes ensure the successful combination of genetic material from both parents.

What is the term for the movement of cells to form the three primary germ layers?

- ◯ Fertilization
- ◯ Implantation
- ◯ **Gastrulation ✓**
- ◯ Cleavage

> The movement of cells to form the three primary germ layers is known as gastrulation. This process is crucial in embryonic development as it establishes the foundational layers that will differentiate into various tissues and organs.

Which process involves the rapid cell division of the zygote without growth?

- ◯ Neurulation
- ◯ **Cleavage ✓**
- ◯ Gastrulation
- ◯ Organogenesis

> The process that involves the rapid cell division of the zygote without growth is known as cleavage. This stage occurs shortly after fertilization and leads to the formation of a multicellular embryo.

What is the primary function of the placenta?

- ◯ Produce gametes
- ◯ **Facilitate nutrient and gas exchange ✓**
- ◯ Protect the embryo from infections
- ◯ Initiate labor

> The placenta is a vital organ that develops during pregnancy, facilitating the exchange of nutrients, gases, and waste between the mother and the developing fetus.

Which germ layers are formed during gastrulation? (Select all that apply)

- ☐ **Ectoderm ✓**
- ☐ **Mesoderm ✓**
- ☐ **Endoderm ✓**
- ☐ Epidermis

> During gastrulation, three primary germ layers are formed: the ectoderm, mesoderm, and endoderm. These layers give rise to all the tissues and organs in the developing embryo.

Which of the following is a known teratogen?

- ◯ Vitamin C
- ◯ **Alcohol ✓**
- ◯ Water
- ◯ Oxygen

> A teratogen is an agent that causes malformation or abnormal development of an embryo or fetus. Common examples of teratogens include alcohol, certain medications, and infections such as rubella.

Which of the following are stages of early embryonic development? (Select all that apply)

- ☐ **Zygote ✓**
- ☐ **Blastula ✓**
- ☐ Neurula
- ☐ **Gastrula ✓**

> Early embryonic development includes several key stages such as fertilization, cleavage, blastulation, and gastrulation. Each of these stages plays a crucial role in the formation and differentiation of the embryo.

Where does fertilization typically occur in the human body?

- ◯ Uterus
- ◯ Ovaries
- ◯ **Fallopian tubes ✓**
- ◯ Cervix

> Fertilization in the human body typically occurs in the fallopian tubes, where the sperm meets the egg after ovulation. This is the initial step in the process of conception leading to pregnancy.

Which of the following are ethical considerations in embryonic research? (Select all that apply)

- ☐ **Use of embryonic stem cells ✓**
- ☐ **Genetic modification ✓**
- ☐ In vitro fertilization
- ☐ **Cloning ✓**

> Ethical considerations in embryonic research include the moral status of embryos, informed consent from donors, and the potential implications for future human life. These factors raise significant ethical debates regarding the use and manipulation of human embryos in research.

Which stage of embryonic development immediately follows fertilization?

- ◯ Blastula
- ◯ **Zygote ✓**
- ◯ Gastrula
- ◯ Fetus

> The stage of embryonic development that immediately follows fertilization is called the zygote stage. During this stage, the fertilized egg undergoes cell division and begins the process of development into an embryo.

Which systems develop during organogenesis? (Select all that apply)

- ☐ **Cardiovascular ✓**
- ☐ **Respiratory ✓**
- ☐ **Digestiv ✓**
- ☐ **Endocrine ✓**

> During organogenesis, multiple organ systems develop, including the nervous system, circulatory system, digestive system, and respiratory system. This process is crucial for the formation of functional organs in the developing embryo.