Questions part 4: Vertebratenentwicklung (Vorlesung vom 19.12. und 20.12.11)
Due: 11:59am on Wednesday, December 21, 2011
Note: You will receive no credit for late submissions. To learn more, read your instructor's Grading Policy

Chapter 32 Pre-Test Question 5
Description: (a) Gastrulation is the process that directly forms the _____.

Part A
Gastrulation is the process that directly forms the _____.

Hint A.1
Gastrulation establishes the basic body plan of an animal.

ANSWER: 
- blastula
- primary germ layers
- central nervous system
- organs
- muscles

Gastrulation gives rise to either two or three germ layers.

Chapter 32 Question 22
Description: [[Bloom's Taxonomy: Knowledge/Comprehension]] (a) The blastopore is a structure that first becomes evident during...

Part A
The blastopore is a structure that first becomes evident during

ANSWER: 
- cleavage.
- gastrulation.
- fertilization.
- the eight-cell stage of the embryo.
- metamorphosis.
### Chapter 47 Pre-Test Question 7

**Description:** (a) During the early development of a human embryo, the _____ eventually forms the _____.

**Part A**

During the early development of a human embryo, the _____ eventually forms the _____.

**Hint A.1**

Think about how the basic body plane is established in the embryo.

**ANSWER:**

- trophoblast ... embryo proper
- hypoblast ... amniotic cavity
- epiblast ... placenta
- epiblast ... ectodermal, mesodermal, and endodermal tissues
- blastocoel ... archenteron

The migration and differentiation of epiblast cells produce the embryo proper and its three basic tissues.

### Chapter 47 Question 2

**Description:** [[Bloom's Taxonomy: Knowledge/Comprehension]] (a) As an embryo develops, new cells are produced as the result of...

**Part A**

As an embryo develops, new cells are produced as the result of

**ANSWER:**

- morphogenesis.
- differentiation.
- preformation.
- epigenesis.
- cell division.

### Chapter 47 Question 9

**Description:** [[Bloom's Taxonomy: Knowledge/Comprehension]] (a) A reproductive difference between sea urchins and humans is...

**Part A**
A reproductive difference between sea urchins and humans is

**ANSWER:**
- sea urchins, but not humans, have a need to block polyspermy because only in sea urchins can there be more than one source of sperm to fertilize the eggs.
- sea urchin zygotes get their mitochondria from the sperm but human zygotes get their mitochondria from the egg.
- sea urchin eggs are produced by meiosis, but human eggs are produced by mitosis.
- sea urchin eggs and sperm are of equal size, but human eggs are much bigger than human sperm.
- the sea urchin egg completes meiosis prior to fertilization, but meiosis in humans is completed after fertilization.

**Chapter 47 Question 22**

**Description:** [[Bloom's Taxonomy: Knowledge/Comprehension]] (a) A human blastomere is...

**Part A**

A human blastomere is

**ANSWER:**
- an embryonic structure that includes a fluid-filled cavity.
- that part of the acrosome that opens the egg's membrane.
- an embryonic cell that is much smaller than the ovum.
- a component of the zona pellucida.
- a cell that contains a (degenerating) second polar body.

**Chapter 47 Question 29**

**Description:** [[Bloom's Taxonomy: Knowledge/Comprehension]] (a) The vegetal pole of the zygote differs from the animal pole in that...

**Part A**

The vegetal pole of the zygote differs from the animal pole in that

**ANSWER:**
- the vegetal pole has a higher concentration of yolk.
- the posterior end of the embryo forms at the vegetal pole.
- the polar bodies bud from this region.
- the vegetal pole cells undergo mitosis but not cytokinesis.
the blastomeres originate only in the vegetal pole.

Chapter 47 Question 33

Description: [[Bloom's Taxonomy: Knowledge/Comprehension ]] (a) Which of the following correctly displays the sequence of developmental milestones?

Part A
Which of the following correctly displays the sequence of developmental milestones?

ANSWER:
- cleavage → gastrula → blastula
- gastrula → blastula → cleavage
- cleavage → blastula → gastrula
- blastula → cleavage → gastrula
- blastula → gastrula → cleavage

Chapter 47 Question 36

Description: [[Bloom's Taxonomy: Application/Analysis ]] (a) If gastrulation was blocked by an environmental toxin, then...

Part A
If gastrulation was blocked by an environmental toxin, then

ANSWER:
- fertilization would be blocked.
- the blastopore would form above the gray crescent in the animal pole.
- the blastula would not be formed.
- cleavage would not occur in the zygote.
- embryonic germ layers would not form.

Chapter 47 Question 38

Description: [[Bloom's Taxonomy: Knowledge/Comprehension ]] (a) The vertebrate ectoderm is the origin of the...
The vertebrate ectoderm is the origin of the nervous system.

Chapter 47 Question 40

Description: [Bloom's Taxonomy: Knowledge/Comprehension] (a) In a frog embryo, gastrulation...

Part A
In a frog embryo, gastrulation

ANSWER: Proceeds by involution as cells roll over the lip of the blastopore. Produces a blastocoel displaced into the animal hemisphere. Occurs along the primitive streak in the animal hemisphere. Is impossible because of the large amount of yolk in the ovum. Occurs within the inner cell mass that is embedded in the large amount of yolk.

Chapter 47 Question 45

Description: [Bloom's Taxonomy: Knowledge/Comprehension] (a) In all vertebrate animals, development requires...

Part A
In all vertebrate animals, development requires


Chapter 47 Question 47
### Chapter 47 Question 53

**Description:** [[Bloom's Taxonomy: Knowledge/Comprehension]]] (a) Extraembryonic membranes develop in...

**Part A**
Extraembryonic membranes develop in

**ANSWER:**
- mammals and birds, but not lizards.
- lizards, but not mammals or birds.
- mammals, but not birds or lizards.
- birds, but not mammals or lizards.
- mammals, birds, and lizards.

### Chapter 47 Question 54

**Description:** [[Bloom's Taxonomy: Knowledge/Comprehension]]] (a) The migratory neural crest cells...

**Part A**
The migratory neural crest cells

**ANSWER:**
- form neural and non-neural structures in the periphery.
- form the spinal cord in the frog.
- form most of the central nervous system.
- form the lining of the lungs and of the digestive tract.
- serve as precursor cells for the notochord.

### Chapter 47 Question 54

**Description:** [[Bloom's Taxonomy: Knowledge/Comprehension]]] (a) From earliest to latest, the overall sequence of early development proceeds in which of the following sequences?

**Part A**
From earliest to latest, the overall sequence of early development proceeds in which of the following sequences?

**ANSWER:**
- preformation → morphogenesis → neurulation
- gastrulation → organogenesis → cleavage
Chapter 47 Question 55

Description: [[Bloom's Taxonomy: Application/Analysis ]] (a) Changes in both cell shape and cell position occur extensively during...

Part A
Changes in both cell shape and cell position occur extensively during

ANSWER:
- gastrulation, but not organogenesis or cleavage.
- organogenesis, but not gastrulation or cleavage.
- cleavage, but not gastrulation or organogenesis.
- gastrulation, organogenesis, and cleavage.
- gastrulation and organogenesis, but not cleavage.

Chapter 47 Question 58

Description: [[Bloom's Taxonomy: Application/Analysis ]] (a) To meet a zygote's metabolic and developmental requirements,...

Part A
To meet a zygote's metabolic and developmental requirements,

ANSWER:
- maternal RNA and maternal proteins must be present.
- paternal RNA and maternal proteins must be present.
- the haploid DNA in the nucleus must be transcribed.
- the zygote must continuously undergo endocytosis of proteins to take them from its environment.
- the nucleus must have hundreds of copies of every gene, allowing a high rate of gene expression.
Description: [[Bloom's Taxonomy: Application/Analysis ]] (a) The embryonic precursor to the human spinal cord is the...

Part A
The embryonic precursor to the human spinal cord is the

ANSWER:
- mesoderm.
- archenteron.
- set of bilateral somites.
- notochord.
- neural tube.

Chapter 47 Question 64

Description: [[Bloom's Taxonomy: Knowledge/Comprehension ]] (a) The term applied to a morphogenetic process whereby cells extend themselves, making the mass of the cells narrower and longer, is...

Part A
The term applied to a morphogenetic process whereby cells extend themselves, making the mass of the cells narrower and longer, is

ANSWER:
- convergent extension.
- bi-axial elongation.
- induction.
- elongational streaming.
- blastomere formation.

Chapter 47 Pre-Test Question 9

Description: (a) Reversal of left-right asymmetries in humans can arise in response to a genetic condition that ______.

Part A
Reversal of left-right asymmetries in humans can arise in response to a genetic condition that ______.

Hint A.1
This one is a surprise, and the connection is unexpected.
Chapter 47 Question 67

Description: [[Bloom's Taxonomy: Knowledge/Comprehension ]] (a) Hans Spemann and colleagues developed the concept of the primary organizer in amphibian embryos while studying the...

Part A

Hans Spemann and colleagues developed the concept of the primary organizer in amphibian embryos while studying the

ANSWER:

- dorsal lip of the blastopore.
- anterior terminus of the notochord.
- medial cells between the optic cups.
- lateral margins of the neural tube.
- posterior edge of the dorsal ectoderm.

Chapter 47 Question 68

Description: [[Bloom's Taxonomy: Application/Analysis ]] (a) Which of the following is an adult organism that has fewer than 1,000 cells?

Part A

Which of the following is an adult organism that has fewer than 1,000 cells?

ANSWER:

- fruit flies, *Drosophila melanogaster*
- African clawed frogs, *Xenopus laevis*
- chickens, *Gallus domesticus*
- humans, *Homo sapiens*
- nematodes, *Caenorhabditis elegans*
Chapter 47 Question 72

Description: [Bloom's Taxonomy: Knowledge/Comprehension] (a) If the apical ectodermal ridge is surgically removed from an embryo, it will lose...

Part A
If the apical ectodermal ridge is surgically removed from an embryo, it will lose

ANSWER:
- the developmental substrate for the kidneys.
- unequal cytokinesis of blastomeres.
- guidance signals needed for correct gastrulation.
- the developmental substrate for the gonads.
- positional information for limb-bud pattern formation.

Chapter 47 Misconception Question 1

Part A
Select the correct statement about embryonic development in a frog.

ANSWER:
- Development from zygote to blastula involves mitotic division, cell movement, and cell growth.
- The reorganization of cell layers during gastrulation allows the layers to interact with each other in new ways.
- The blastocoel of a developing frog embryo develops into the digestive tract.

This choice is correct. Read about the events of gastrulation and their significance in Concept 47.2.

Chapter 47 Misconception Question 3

Part A
Identify the correct statement(s) about Spemann's organizer.
Select all that apply.

ANSWER:
- Spemann's organizer is made up of totipotent cells.
- Spemann's organizer is the dorsal lip of the blastopore in frog gastrulation.
Spemann’s organizer initiates a chain of inductive interactions in frog development.

Spemann’s organizer is the dorsal lip of the blastopore in the early gastrula. This region organizes the embryo’s body plan, inducing changes in surrounding tissues to cause formation of the notochord, neural tube, and other organs. Read about Spemann’s organizer in Concept 47.3.

Chapter 47 Misconception Question 4

Part A

In an embryonic vertebrate, the zone of polarizing activity (ZPA) is a block of tissue located on the posterior side of a limb bud. The ZPA provides information about the anterior-posterior axis of the limb. Cells nearest the ZPA form the most posterior of digits (like our little finger); cells farthest from the ZPA form the most anterior digits (like our thumb).

How would a vertebrate forelimb bud develop if it had two zones of polarizing activities, one on the posterior side and one on the anterior side of the bud?

ANSWER:

- The forelimb bud would develop with extra digits, in a mirror image arrangement to the normal digits.
- The forelimb bud would develop into a hind limb.
- The embryo wouldn’t develop a forelimb.

Look at Inquiry Figure 47.25, which describes what happened when the ZPA was transplanted from a donor chick embryo to the anterior margin of a limb bud in a host chick. The result was mirror image duplication of digits, suggesting that ZPA cells secrete a signal that diffuses from its source and conveys positional information indicating “posterior.”

Chapter 47 Pre-Test Question 5

Description: (a) The mesoderm gives rise to _______.

Part A
The mesoderm gives rise to ______.

Hint A.1
Consider the location of mesoderm. Hint: "meso-" refers to middle.

**ANSWER:**
- the gastrointestinal tract and pancreas
- jaws and teeth
- skeletal and muscular systems
- the central nervous system
- the lining of the lungs

The muscles and skeleton are of mesodermal origin.

Chapter 47 Question 34

**Description:** [[Bloom's Taxonomy: Knowledge/Comprehension]] (a) Cells move to new positions as an embryo establishes its three germ tissue layers during...

**Part A**
Cells move to new positions as an embryo establishes its three germ tissue layers during

**ANSWER:**
- gastrulation.
- fertilization.
- cleavage.
- induction.
- determination.

**Score Summary:**
Your score on this assignment is 0%.
You received 0 out of a possible total of 28 points.