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(Most Important Questions on Developmental Biology)

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Sahi Prep Hai Toh Life Set Hai

Q1. Which of the following set of combinations is correct concerning the process of metamorphosis?
A. In frog simple less complex larva develops into a complex adult
B. It is the hormonal Inactivation of development that gives animals a new form
C. It changes the organism morphologically, physiologically, and behaviourally
D. It changes the habitat, food, behaviour ecologically
E. It is a developmental and ecological transition
A. C,B,D,E B. A,C,D
C. A,C,B D. A,C,D,E

Q2.Which of the following statement is/are correct concerning Primary Larva and Secondary Larva?
1.primary larva and Adult have a similar body plan
2. Examples of the primary larva is frog and tadpole
3.Primary Larva and Adult have a different body plan
4.Examples of secondary larva frog and tadpole
A. 1,4 B. 3,4
C. 2,1 D. 2,3

Q3.Find the correct match in the process of Amphibian metamorphosis?

TYPE OF CHANGES	TARGET TISSUE
1.GROWTH	A.TAIL OF FROG
2.DEATH	B.HINDLIMB
3.REMODELLING	C.LIVER ENZYMES OF FROG
4.RESPECIFICATION	D.INTESTINE OF FROG

A. 1-B,2-A, 3-D, 4-C
B. 1-A,2-D,3-B,4-C
C. 1-C, 2-D,3-C,4-A
D. 1-D,2-C,3-B,4-A

Q 4. In chicks, the development of wing feathers, thigh feathers, and claws depends on epithelial specificity conferred by induction from different sources of the dermis. This may be attributed to?
A. Inactivation of genetic interaction
B. Autocrine Interaction
C. Regional specificity of Induction
D. Receptor activation by hormones

Q.5. Following statements related to the organizer were made in the case of amphibians 1. It cannot organize the host and donor tissues into a secondary embryo
2. It induces the host ventral tissues to change their fate from a neural tube and dorsal mesodermal tissues
3.It cannot self-differentiate into dorsal mesoderm
4.It can initiate the movement of gastrulation
Choose the correct option:
A.1&2 B. 2&4
C.2&3 D.4&3

Q6. In case of morphallictic regeneration:-
A. There is repatterning of existing tissues with new growth
B. There is repatterning of existing tissue after the stem cell division
C. .there is cell division of differentiated cells
D. There is the differentiation of cells at the cut surface which become undifferentiated

Q.7. Choose the correct order of segmentation genes in Drosophila:
A. bicoid- >kruppel-> hairy-> wingless
B. hunchback-> runt->Gint-> Patched
C. Nanos-> Tailless->Caudal->armadillo
D. Labial-> wingless->nanos-> hunchback

Q.8. In Drosophila Engrailed expression defines:
A. anterior margine of segment
B. posterior margin of the segment
C. posterior compartment of each segment
D. anterior compartment of each segment

Q9. If non-functional ovastacin containing ova is allowed to fuse with sperm in humans The following possibilities may be of significance:
1.The sperm will bind and penetrate the zonapelusida but will not be able to fuse with ovum membrane.
2.Slow block polyspermy will not occur
3.Fast block polyspermy will not occur
4.Polyspermy will occur frequently
5.ZP2 will not be clipped by cortical granule protease
A.1,4 B. 2,3
C.3,5 D.4,5

Q10.Following are certain facts about the specification of developing embryo:
A. it is the reversible and the final stage of commitment
B. .It is irreversible and the Initial stage of commitment
C. It is non-labile and early stage of commitment
D. It is labile and early stage of commitment

ANSWERS

1. D	2. B	3. A	7. A	8. D	9. D
4. C	5. B	6. A	10. D		

SOLUTION

1. In case of morphallictic regeneration:-
● There is repatterning of existing tissues with new growth
● There is repatterning of existing tissue after the stem cell division
● There is cell division of differentiated cells
● There is the differentiation of cells at the cut surface which become undifferentiated

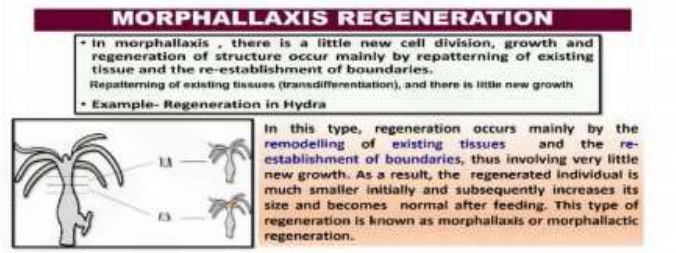
2. Secondary Larva:-Larva and adult possesses similar basic body plan; eg; Butterfly and caterpillar; Frog and tadpole
Primary Larva:- Body plans of adult and larva are drastically distinct; eg; Sea-urchin Larva- Bilaterally Symmetrical, eats plankton; Adult Sea-Urchin- pentameral(fivefold symmetry), feeds on algae

3. THE THYROID HORMONE CAUSES FOUR TYPES OF CHANGES:
● Growth- eg Hind limb of Frog
● Death – eg. Tail of Frog
● Remodelling – eg. Intestine of Frog
● Respecification of Frog eg. Liver Enzyme of Frog

4. When different dermis (mesenchyme) are recombined with the epidermis (epithelium) in the chick, the types of cutaneous structure made by epidermal epithelium are determined by the sources of mesenchyme.

5. PROPERTIES OF ORGANISER
● To self differentiate dorsal mesoderm,
● Can dorsalize the surrounding mesoderm into paraxial(somite-forming) mesoderm when it would otherwise form ventral mesoderm
● Can dorsalize the ectoderm and induce the formation of neural tube
● It can initiate the movements of gastrulation

6.



7. ORDER OF EXPRESSION:-
Solution: MATERNAL->GAP-> PAIR RULE-> SEGMENT POLARITY->HOMIOTIC GENE
● MATERNAL- Bicoid, hunchback, nanos , caudal
● GAP- Kruppel , gint, tailless
● Pair rule- hairy, runt
● Segment polarity - wingless,armadillo,patched
● Homeotic - labile

8. Engrailed transcription mark the anterior boundary of each parasegment (and the posterior border of each segment)

9. Ovastacin cleaves ZP2 at N terminus preventing more sperm from binding and penetrating the oocyte, thus hardening the zona pellucid.
Ovastacin is secreted by cortical granules

10. Specification properties: It is the early stage of commitment, Reversible/labile.