Developmental Biology Lecture 14 (Week 9, Tuesday) 10/21/2014

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So last week was fall break, and then Thursday was the exam. There is one question that could possibly be dropped from the exam (nothing sure yet):

In what way are the homeotic genes of flowering plants similar to those of Drosophila and other animals?
A) All homeotic genes are transcription factors of the homeobox class.
B) The homeotic genes of flowers are derived during evolution from the same ancestral genes used in animals.
C) Mutations in the homeotic genes of flowers cause transformation of one organ into another.
D) The homeotic genes of plants are arranged in a cluster on the chromosome.
E) Homeotic genes in both plants and animals are transcription factors of the bHLH type.

The answer is **C**.

Remember: Cell adhesion molecules WILL be on the next exam! Inlcuding integrins, cadherins, and immunoglobulin domains.

Also, on the morphogenesis slide from the previous lecture: the picture shows flowering bodies from slide mold.

Slide 1: Endoderm with ectoderm: cells do not join to form a sphere. (incomplete)

There are different adhesion molecules do not allow the different types of cell to combine; they don't stick together.

Slide 2: The strongest cells with the high affinity come together on the inside, while the ones with lower affinity are on the outside.

- similar cells adhere to one another (missing)

- cells with stronger binding found on inside (Missing)

Slide 3) Using fibroblasts. Transfect to add DNA to allow cadherin expression.

Diagram: the red on the outside has less adherin. Cells with less adherin are found on the outside; cells with more adherin are on the inside.

- cells with more cadherin adhere more strongly (missing)

Clicker Question!

What would you need in the tissue culture medium for the experiments on the previous slide to work?

A) A protein adhesion cofactor
B) ATP
C) Calcium
D) EDTA
E) Immunoglobin peptides

Answer is C!

Slide 4) Adherins are species specific (as the sponge experiment shows)

Slide 5) radical cleavage: symmetric pattern

Unequal cleavage: Xenopus (remember where P2, ABa, ABp, and EMS would be found.

The plane of cleavage helps to determine shape. Change the cleavage and you change the form.

Slide 6) It is not the spindles that determine cleavage, but the centrosomes.

Plants:
- No centrioles (missing)
- No furrows (in division) (missing)

Slide 7) In this diagram the change between the middle and the last pictures is NOT due to cell division. The cells are changing shape!

Slide 8) (blank) E Cadherin

Slide 9) Outer surface of the mouse embryo: Trophectoderm
Inside: Inner cell mass

Radical cleavage is like anticlinal division in plants.
Tangenital is like periclinal

Slide 10) Pressure gives form. Circular (sphere) and not collapsed. The Sodium/Potassium (Na/K) pumps are needed to help maintain pressure. They keep solute concentrations stable so the osmosis works properly.

- Ion pumps result in fluid movement into the blastocoel (missing)

Slide 11) Restrict migration of membrane proteins (missing)

- This is important for the intestines and uptake of nutrients.

Clicker Question!

Which type of cell-cell junction is most commonly associated with epithelial cells?

A) Desmosome