

Zoology 470 - Quiz #2 – 2009 – Key (answers in bold)

This quiz has **8** questions on **2** pages, and is worth a total of **8** points, and is designed to take **10 minutes**. It is designed to test basic knowledge about signaling networks important in developmental biology.

Use the accompanying answer sheet and a #2 pencil to enter your answers for the following multiple-choice questions. There is **one** right answer for each question. Please make sure you enter your student ID number on the answer sheet.

1. Which of the following pathways relies on elevation of β -catenin to transduce its signals?
 - a. Receptor tyrosine kinase signaling
 - b. Wnt signaling**
 - c. Hedgehog signaling
 - d. Receptor serine/threonine kinase such as TGF- β family receptors
 - e. G protein-linked receptors
2. Which of the following is released into the cytoplasm as a response to elevation of inositol trisphosphate (IP₃)?
 - a. Diacylglycerol (DAG)
 - b. Calcium ions**
 - c. Cubitus interruptus (Ci) protein
 - d. Smads
 - e. None of the above
3. Cells respond to Wnt signaling using which type of receptor?
 - a. Frizzled**
 - b. Smoothed
 - c. FGF receptor
 - d. Steroid hormone receptor
 - e. none of the above
4. Gli3 is a vertebrate protein related to the cubitus interruptus (Ci) protein from flies. It acts as a transcriptional repressor in cells that have not received a certain type of signal. When cells receive the signal, Gli3 becomes a transcriptional activator (i.e., it turns "on" the expression of genes). What signal is involved?
 - a. Wnt
 - b. Testosterone
 - c. Hedgehog**
 - d. Notch
 - e. fibroblast growth factor (FGF)
5. The Planar Cell Polarity (PCP) pathway is activated by what type of signal?
 - a. Hedgehog
 - b. BMP
 - c. Wnt**
 - d. Steroid hormone
 - e. None of the above

6. Which of the following is NOT usually true for growth factors?
- a. They act at short range
 - b. Different cells respond differently to the same growth factor
 - c. They can stimulate differentiation
 - d. They are carried long distances in the bloodstream**
 - e. They are proteins
7. BMPs and other TGF- β family growth factors function by activating which of the following?
- a. Ras
 - b. Smads**
 - c. Tcf/Lef proteins
 - d. β -catenin
 - e. None of the above
8. Which organelle serves as a main storage site for calcium ions?
- a. Lysosomes
 - b. Ribosomes
 - c. Phagosomes
 - d. Apoptosomes
 - e. Endoplasmic reticulum**