

## Voorbeeldvragen Ontwikkelingsbiologie en genetica

1. In the four-cell *C. elegans* embryo, signal-transduction is critical in cell fate determination. Specifically:

A At the four-cell stage only the endoderm-mesoderm decision is determined by cell-cell signaling (between P2 and EMS)

B P2 signals to ABp via the APX-1 ligand/GLP-1 Notch Receptor and to EMS via a MOM-2 Wnt pathway

C ABp signals to P2 via the APX-1 ligand/GLP-1 Notch Receptor, and P2 to EMS via a MOM-2 Wnt

D P2 signals to ABp via a MOM-2 Wnt pathway and to EMS via the APX-1 ligand/GLP-1 Notch Receptor

E None of the answers above are correct

Correct answer: B

2. Asymmetric divisions are important in generating undifferentiated progenitor cells and differentiating daughter cells. Several evolutionarily conserved molecules are involved in asymmetric division of the *C. elegans* zygote and *Drosophila* neuroblast. Specifically,

A Both systems are examples of intrinsic asymmetric cell divisions, in which polarity depends on planar cell polarity protein localization and a G-alpha/ Pins/ Mud-related pathway determines the cell cleavage plane.

B Both systems use E-cadherin-based polarity, and a G-alpha/Inscuteable/Pins related pathway for cleavage-plane determination.

C Both systems are examples of niche-dependent asymmetric cell divisions, in which polarity depends on Par protein localization and a G-alpha/Pins/ Mud-related pathway for cleavage-plane determination.

D Both systems are examples of intrinsic asymmetric cell divisions, in which polarity depends on Par protein localization and a G-alpha/Pins/Mud-related pathway for cleavage-plane determination.

Correct answer: D