

Embryology

Phase	What happens?
Fertilisation	Sperm meets oocyte; zygote
Cleavage	Zygote starts dividing; into morula
Gastrulation	Two different types of cells; blastocyst – trophoblast (extraembryonic structures) and inner cell mass (embryonic stem cells) 5-10 days – implant into uterine wall Then, 3 distinct germ layers (ectoderm, mesoderm, endoderm) from formation of embryonic disc
Formation of a tube-in-a-tube body plan	Development of gut (gut tube from body folding in 4 th week)
organogenesis	Budding off the gut; heart formed by itself

Gastrulation

Epiblast (ectoderm) invaginates through primitive groove; replace hypoblast and form endoderm. Then forms mesoderm and then the left over epiblast forms ectoderm. Happens from caudal to cranial

Left –right asymmetry

- Primitive node and primitive streak; due to cilia being present, directing flow of fluid
- Rotating cilia – cause stream of fluid to one side; still cilia – at the edge that don't move but detect fluid and start to express different genes

Ectoderm

Structure	How?
Notochord (mesoderm)	<ul style="list-style-type: none"> - Primitive streak eventually disappears and forms notochord - Enters from primitive node. - Cells keep migrating in into node - Migrate, in along the midline from caudal to cranial - Attaches to endoderm, then detaches, forming cartilage rod - Teratomas – primitive streak not disappearing; can be corrected
Neural plate	Before neural tube Notochord in mesoderm, send signals to ectoderm to thicken and become neural plate Cranial to primitive node Forms above notochord
Neural tube	Formation= neurulation, through invagination of neural plate Also, neural crest cells in mesoderm (but it itself is made from ectoderm, thickened into neural plate), which are present on top of neural tube. Segmentation: turns into brain and spine; cranial end starts to swell and form vesicles, remainder to spinal cord. Determined by Hox gene family (transcription factors)
Neural crest cells	Dorsal root ganglia, enteric ganglia, schwann cells, melanocytes, SNS PSNS ganglia, muscles, cartilage and bone of skull, face and jaw, pharynx.
Skin	After neurulation; Become two layered structure: periderm and basal layer. Basal layer divide to become periderm and basal layer