

DEVELOPMENT SYSTEM

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Stages Of Development

- Fertilization (Sperm & Egg meet.)
 - Acrosomal & Cortical Reactions
- Activation of the Egg (Creates Nucleus of Zygote)
- Cleavage (Pinching of Membrane)
- Gastrulation (Forms 3-layered Embryo)
- Organogenesis (Development of organ rudiments.)
- Introduction of Amniotic Fluid (Self-Explanatory)

Morphogenesis

The beginning of an organism, the first step of life, and the fetus begins to take shape. In this process the organism takes place as well as assigns the specific differentiated cells to their appropriate locations.

Differentiation

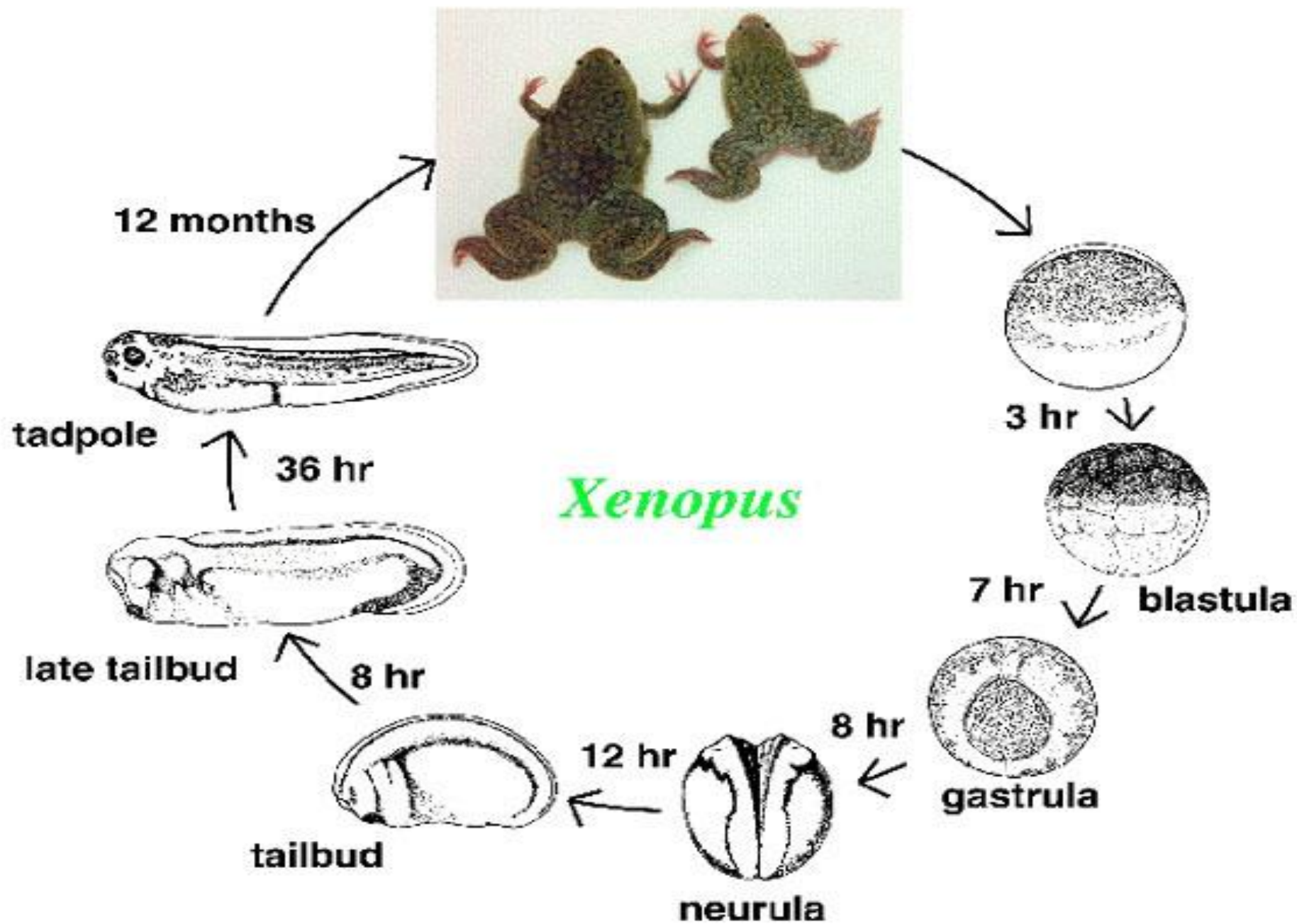
This is the process of the changing of cells into cells that accommodate more complex tissues. This specializes the cell structure and function. As well as, combining genetics with the structure of a single cell. You can't have a heart cell in your leg can you?

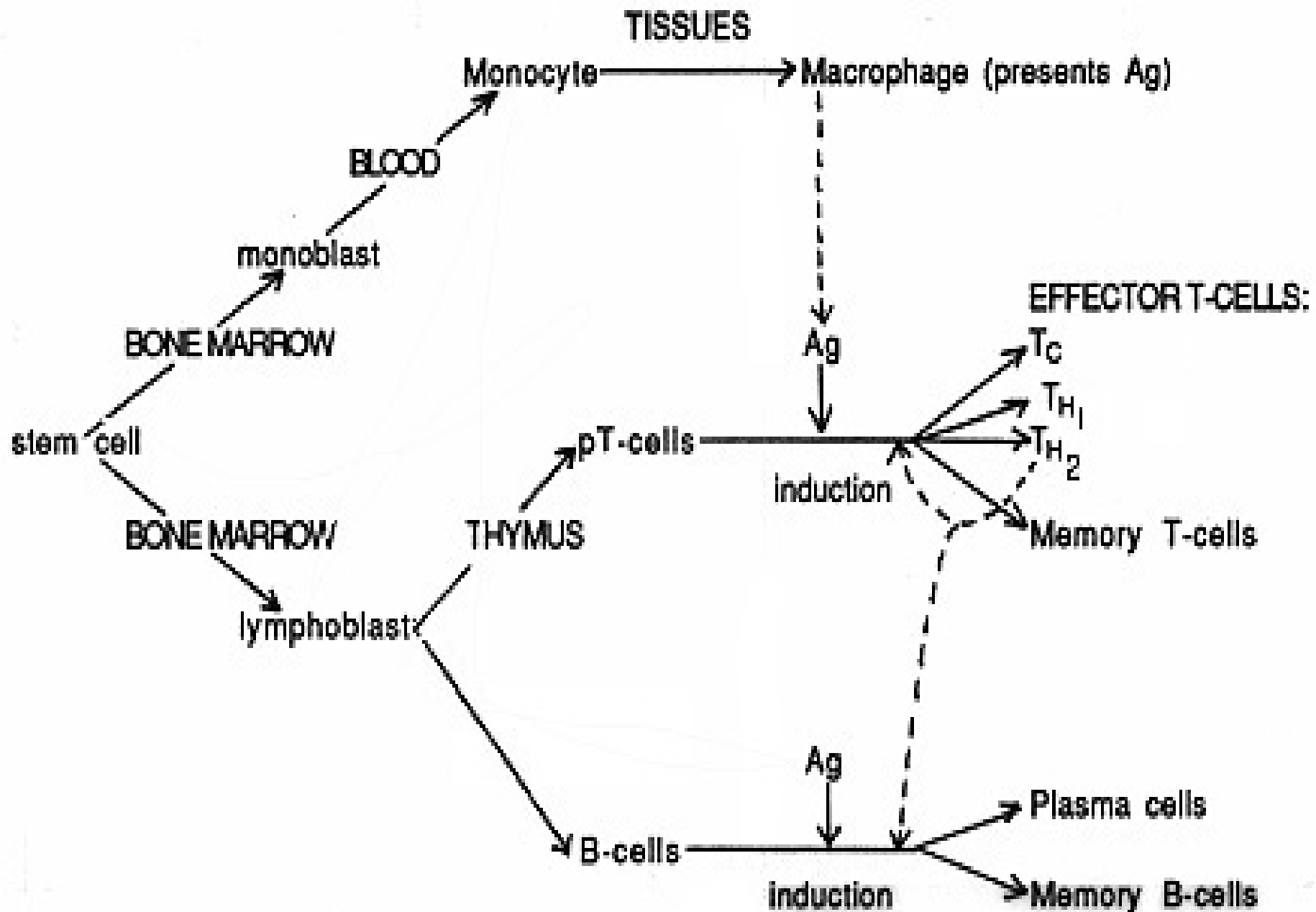
Fun Fact...

Did you know? That our bodies are made of cells, many cells? We hope you did. We are in fact made up of a vast collection of over 37 Trillion (37,000,000,000,000 FREAKING CELLS PEOPLE!!!) cells from head to toe.

HOX Genes

HOX Genes (also known as homeotic genes) are a group of related genes that control the body plan of an embryo along the anterior-posterior (head-tail) axis.





Importance

- **Growth and development have important implications for domestic animal production because they significantly influence the value of the animal being produced. A substantial proportion of agricultural research focuses on how to make animal growth and development processes more efficient. This research involves several disciplines because animal growth and development are controlled by genes and hormones. Because growth and development are continuous and dynamic processes.**

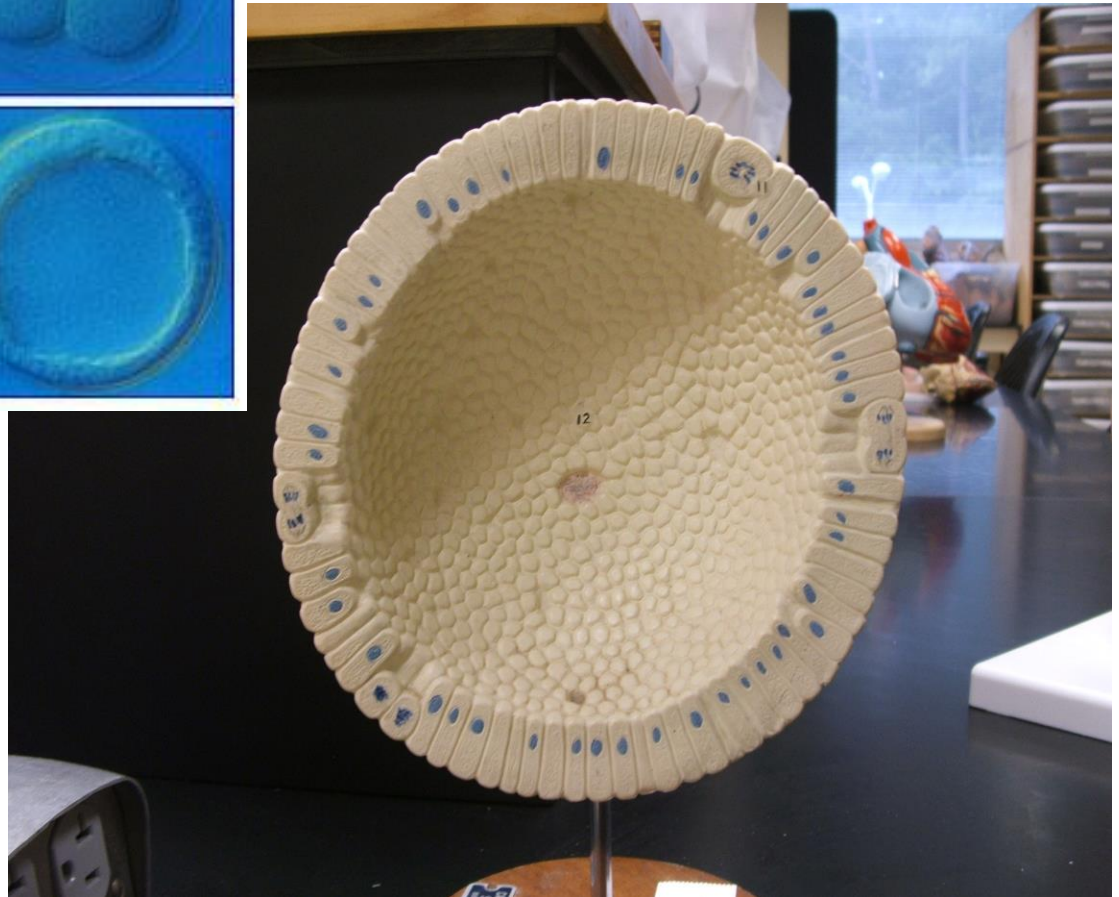
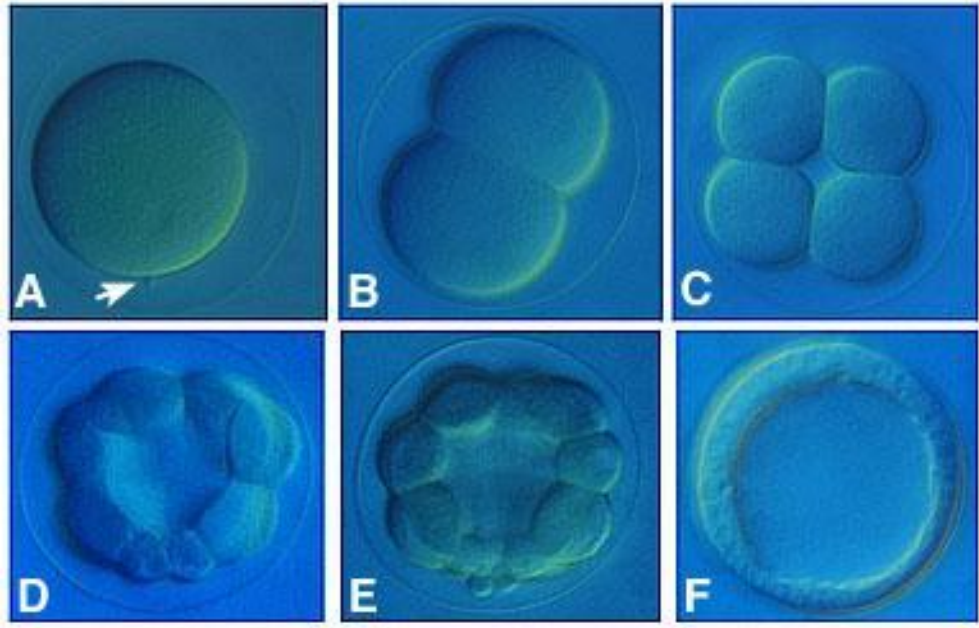
Diseases

- Any form of genetic-related cancer
- Heart Disease
- Mental Disorders (Down's, Huntington's, Mental Retardation)
- Polysyndactly (Too many of something)

Interdependence

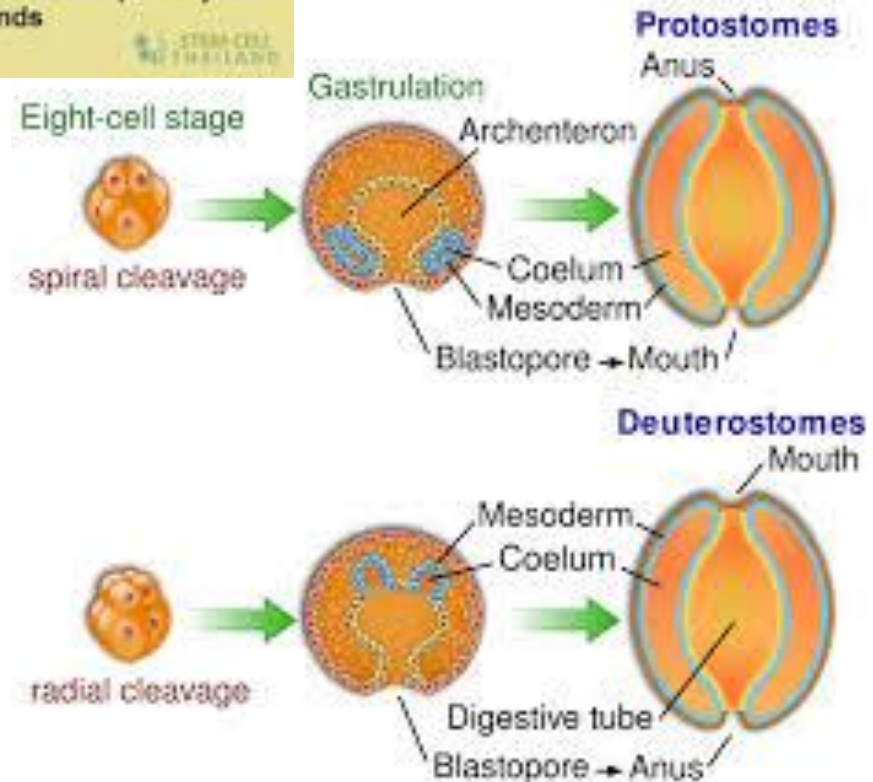
The development system is directly related to the reproductive and immune systems. The system uses the messages related to fertilization and defending itself against the spread of disease.

CLEAVEAGE



GASTRULATION

ECTODERM	MESODERM	ENDODERM
<ul style="list-style-type: none"> • Epidermis of skin and its derivatives (including sweat glands, hair follicles) • Epithelial lining of mouth and anus • Cornea and lens of eye • Nervous system • Sensory receptors in epidermis • Adrenal medulla • Tooth enamel • Epithelium of pineal and pituitary glands 	<ul style="list-style-type: none"> • Notochord • Skeletal system • Muscular system • Muscular layer of stomach and intestine • Excretory system • Circulatory and lymphatic systems • Reproductive system (except germ cells) • Dermis of skin • Lining of body cavity • Adrenal cortex 	<ul style="list-style-type: none"> • Epithelial lining of digestive tract • Epithelial lining of respiratory system • Lining of urethra, urinary bladder, and reproductive system • Liver • Pancreas • Thymus • Thyroid and parathyroid glands



FATE MAPPING

- How do cells know where they are in the Embryo and what they will become?
- Cues from two main sources
- Uneven distribution of protein molecules.
- Signaling from near by cells.
- Fate Mapping is done by staining cells in early stage embryos.

CITATIONS

<https://www.youtube.com/watch?v=N0p-o5FJndQ>

<http://biology.stackexchange.com/questions/1145/fetal-development-gastrulation-and-embryonic-disc>

<http://www.bio.davidson.edu/courses/GENOMICS/method/UrchDev.html>