LABORATORY #3 EARLY FROG DEVELOPMENT

The stages to be examined are: unsegmented or zygote or uncleaved; early cleavage; late cleavage; blastula; early gastrula; late gastrula; neural groove. These may not all be in your slide box, so take only one slide at a time from the common supply.

UNCLEAVED EGG: we need to see the gradients of pigment and yolk granules in the egg; more pigment in the cortex of the animal hemisphere, larger yolk granules in the vegetal hemisphere; the nucleus is in the animal hemisphere. Notice the fertilization membrane.

EARLY CLEAVAGE: Notice the first cleavage has passed through the animal vegetal axis. Notice the nuclei are still toward the animal pole.

LATE CLEAVAGE: Notice the difference in size of the blastomeres in the animal and vegetal halves of the egg (you should be able to tell the animal pole by the cortical pigment still.) Notice the crevise

which is the start of the blastocoel.

BLASTULA. Notice the blastocoel in the animal half of the egg, notice the gradient in cell size. Be able to draw a fate map of this stage.

EARLY GASTRULA: The first step of gastrulation is the formation of the archenteron which has a chordamesoderm roof and an endoderm floor. This is a two layered stage with the outer layer, or epiblast containing only ectoderm, both presumptive neural plate and epidermis and the inner layer or hypoblast containing two germ layers, the endoderm and the chordamesoderm. The second step is the separation of the mesoderm and endoderm into two separate layers to give a three layered gastrula. The mesoderm grows forward and down between the ectoderm and endoderm. The endoderm grows dorsally and forms the complete lining of the roof of the archenteron, so that now it becomes a gut. Make sure you know the orientation of dorsal-ventral, anterior-posterior, medial-lateral, cephalic-caudal, proximal-distal. Know the changes in the fate maps as gastrulation proceeds, both inside and out. Know where the animal and vegetal poles end up after gastrulation. What is the relationship of the animal pole to the orientation of the bilaterally symmetrical organism.

NEURULA: Notice the relationship of the neural plate and the underlying chordamesoderm. Notice the size of the foregut as compared to the hindgut. Know the fate map of the surface and the inside at this stage.

ANSWER SHEET FOR LABORATORY #3 NAME_____
Hand this in at the end of the lab period.

How can you tell if the egg is fertilized?

How many cleavages occur to get to the 32 cell stage?

How can you tell the animal from the vegetal pole?

How can you tell the antierior end of the embryo at the gastrula stage?

How can you tell which is dorsal in the neurula stage?

What is the difference between the blastocoel and the archenteron?

What is the difference between the archenteron and the gut?

What layer of mesoderm is next to the ectoderm and the coelom?

What is the relative size of ectoderm, mesoderm, and endoderm cells? This can be approximate.