Developmental Biology, Week 15 Tuesday 12/02/2014

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(Happy December!)

After today, we have three more lectures and then the final!
There are two slides from the previous lecture that were covered and then lecture 23.

Slide 15) This slide shows the structure of a neuron. There is an input (integration) end which is the top end in this picture. This receives the electrical signal. The bottom (output) end continues the transmission of the signal. The young processes off of the neuron are called neuritis.

Slide 16)
(missing) Synapse of formation
(missing) Refinement of connections

Slide 1)
(incomplete) All of the cells of the NS are derived from the neural plate or_ ectodermal placodes.

Slide 2) elongated columnar epithelium basically means the region thickens.

(missing) Form neurons in the head region.

Know the nasal placode and the otic placode as examples (don't confuse otic with optic- otic refers to the ear!). The lens of the eye and the teeth are other examples of structures coming from placodes.

Slide 3) NB refers to neuroblasts. These are early cells of the nervous system that give rise to neural tissues. This slide is showing conservation between Drosophila and mice. The layout is the same. Dpp and Sog are other examples of conservation.

(missing) Mechanism of regional specification is conserved.

Slide 4) M is for motor neurons. These are neurons that connect to muscle and help us move. C is for commissural neurons. These are sometimes called interneurons, they connect from neuron to neuron. Commissural basically means they cross between two regions.

Homeobox genes code for homeodomain proteins (these are transcription factors). Hox genes are an example of homeobox genes.

Clicker Question!

Neurons come from:

A) Neural plate
B) Ectodermal placodes
C) Neural crest cells
D) Neural tube
E) All of the above

Answer is **E**!

Slide 5) The sensory neurons are what we know as DRG's.

Slide 6)
(incomplete) Shh is the signal from the notochord.

Slide 7) Shows that Shh is critical for proper development.

Clicker Question!

At high concentrations Sonic hedgehog induces

A) Floorplate
B) Placodes

C) Dermomyotome
D) All of the above
E) A and C

The answer is **A**! If C said sclerotome instead, A and C would be correct.

Slide 8) Know this for the final! Remember what spina bifida and ancephaly are and their link to folic acid during pregnancy. This slide shows about 4 weeks of development. The prosencephalon is the forebrain, the mesencephalon is the midbrain, and the rhombencephalon is the hindbrain.

Slide 9) This is about five weeks of development. The labels are as follow: Diencephalon, mesencephalon, metencephalon, myelencephalon, spinal cord, fourth ventricle, future cerebral aquaduct, optic vesicle, lateral ventrical, third ventricle, and telencephalon.

The telencephalon gives rise to the cerebral hemispheres in the forebrain. Lots of expansion occurs.

The mesencephalon gives rise to neural tracts.

The metencephalon and the myelencephalon are the hindbrain. The metencephalon gives rise to the cerebellum, which helps coordinate movement, and the myelencephalon gives rise to the medulla, which controls basic, necessary body function (heart rate, blood pressure, ect)

Slide 10) Missing labels are Gyrus and Sulcus. Gyrus is a raise or bump, and the sulcus is the resulting groove on the surface of the brain. Natural folds in tissue. This picture shows development at about 6 months.

Can you tell the difference between a male and female just by looking at the brain? No- they are too similar in appearance. There may be small differences but they are not enough to tell apart.

Slide 12) There is distinct migration to form layers. Without them, the brain will not function properly.