

## Anatomy and Physiology Laboratory Assignments

### #1 Tissues, Integument & Bone –total 20 points

**Tissues lab:** Follow the directions in the Tissues handout. There will be drawings of each tissue subtype assigned (**This will be approximately 14 drawings**). **No structures need to be identified on these slides. Labels may be added later, so the better the drawings, the easier it will be later to just add labels.** Many of these drawings will later be labeled for specific structures so the more effort you put into these drawings now will be beneficial later. **Be sure to include total magnification, tissue subtype and the general function of that tissue subtype on each drawing.**

#### **Skin:**

1. Draw (40X) thin (a.k.a. pigmented/nonpigmented) skin : **epidermis, dermis and hypodermis**. (see Histology book pp187 or 197 and 189) Also label **collagen fibers, fibrocytes, keratinocytes, melanocytes\* and dermal papilla**. Know two other types of cells and two other types of fibers you can find in the dermis. Know the functions all structures labeled.
2. Re-draw or label the drawings from your tissues lab: a section of thick (“Plantar”) skin at 100X or 400X (p 195 in histology book). Label the **5 epidermal strata** in the epidermis and the **papillary and reticular layers** of the dermis. Understand how the keratinocytes are changing in each strata.
3. Draw the scalp section at 40X or 100X. **Label hair follicles, sebaceous glands, sweat glands, arrector pili muscles, and dermal papillae**. Know the functions of these structures and their secretions. See p193 in histology book.

**Bone/Cartilag Histology:** Re-draw or label the tissues assignment drawing of the slide of dry compact bone and label your drawing for: **lacunae, osteons, haversian (central) canals, lamellae and caniculi** . Next to each label indicate the function of each structure. Draw at either 100X or 400X . See pp87-89 in histology book.

Draw several views of developing long bones at 400X in order to see each zone in the growing region. **Label the drawings as to where each zone begins and ends and cite what is occurring in each of these zones.** See pp 75-79 in histology.

Re-examine and label the drawings you made in the histology assignment for the hyaline and elastic cartilages for their **lacunae, chondrocytes and primary fiber types found in their matrices**. See exercise 6 in lab manual.

*\*you may need to look at the other section on this slide to see melanocytes. They will be located at the epidermal/dermal border and contain brown specks.*

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## #2 Muscle –10pts

**A. Muscle Histology:** Label the cross section (cs) skeletal muscle slide for the following structures: **muscle fascicle, perimysium and endomysium. See p 115 in histology.**

Draw cardiac and smooth muscle at 100X and label **nuclei, striations (if present). Be able to distinguish the three subtypes of muscle. See pp109 &117 in histology.**

Motor end plate slide: draw a single motor end plate (40X or 100X) and label **the nerve, one neuromuscular junction and muscle fibers. See p 113 in histo.**

**B. Muscle Handout: complete the handout in the lab practical study guide** you will not be judged on what you write, but it must be complete.

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## #3 Nervous System –15 pts Know the functions of the labeled structures/cells

**Peripheral nerve sections (Draw both the cross and longitudinal sections on this slide)** See pp143&145 in Histology book for the cross section and label **fascicles of axons, perineurium, extensions of epineurium and Schwann cell nuclei.**

**Medullated nerve:** See p 143 and 147 in histology book and label **myelin sheath, node of Ranvier and axons** at 400X

**Astrocyte:** Draw one cell at 400X. Histology book figure on p139 is similar, but not exactly what these cells look like. It is labeled “fibrous astrocyte”

**Microglia:** Draw one cell at 400X. (also on p 139, but processes are longer on our slides) shows an example of this.

**Spinal cord (giant motor neuron):** Remember that motor neurons are going to be found in the ventral grey matter. Use plate in your lab manual (p487) or pp125-129 and p131 in histology book to search this slide for a similar looking neuron. Draw at 400X

**Cerebrum:** Look in the grey matter and draw the large pyrimidal cells in the cortex (400x). See figures on pp133&135 in histology and label **pyramidal cell, nerve fibers and neuroglia nuclei, dendrites, and axon** at 400X.

**Cerebellum:** Look at border of grey matter for large bulbous **Purkinje neurons** (major output neuron of cerebellum) See p137 in histology.

**Slide for Exercise 22: muscle spindle** at 100X. Use the lab manual’s plate on p 489 and be able to identify the muscle spindle. *You will have to search the slide for it . There are many motor end plates on this slide as well. Motor spindles are not round and are thin muscle fibers*

**Sensory: Slides for Exercise 24:** Draw the **retina** at 400x. Use the lab manuals plate on p243&489 and label: **fibers of the optic nerve, ganglion cell layer, nuclei of bipolar cells, nuclei of rods and cones, outer segments of rods and cones, choroid and sclera.**

**Brain Handout labeling: Complete handout adding functions where indicated by the blank line and be able to apply those labels to both human and sheep brains.**

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#### **#4 Endocrine and Reproductive systems –10 pts**

NOTE:

-nice summary of pituitary on p328 in histology book

-know the hormones made, what stimulates their secretion and what their target tissues do when they respond to them.

#### **Endocrine: Slides for Exercise 27:**

**Thyroid gland:** Use pp341-3 Histology book and label “**parafollicular cells, follicles with colloid and follicular cells** at 400X. Know the hormones made by these tissues and what they do.

**Pancreas:** Use pp 285-7 in the Histology book and label **the islets of Langerhans**. At 100X. Know the hormones made by these islets.

**Adrenal gland:** See pp347-49 and label structures: **capsule, the 3 zonas and the medulla** at 100X & know which hormone is made by each zona and the medulla

**Parathyroid gland:** The small cells on this slide are chief cells that make PTH. See p 345 in histology text.

**Pituitary Gland (also called hypophysis)** see p331 and label the anterior versus posterior regions and know what tissues form them and what hormones they secrete.

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#### **Reproductive Systems: Slides for Exercise 43 & 44:**

NOTE: Know the hormones made by each structure and a general effect these hormones have on their target tissues.

**Testes:** See pp355-361 in histology and label structures **seminiferous tubules, spermatid, primary spermatocytes, interstitial and sustentacular cells** at 400X.  
Note: you may have to make a drawing by synthesizing several views as we rarely see as nice a section as the histology book shows. Know the functions of these structures.

**Vagina:** See figure on p 403 in histology book and label stratified squamous epithelium.

**Uterus:** See p395 in histology and label the **endometrium layers (functionalis and basale) and myometrium layers** at 100X. Reminder: this uterus is mid-cycle, the lining changes dramatically with the hormonal changes in the reproductive cycle.

**Ovary:** use figures on pp 377-383 in histology text and label : “**germinal epithelia, tunica albuginea, primordial follicles, follicular cells vs. oocyte , secondary follicle and corpus luteum**. Also label the parts of the large mature follicle (16-20) (**granulosa cells, oocyte, antrum and corona radiata**) at 100X. Know the stages of development of a follicle, the hormones that are synthesized by the different structures and when in the life cycle of the individual each of these is made.