Connective Tissue & Muscle Histology — Student Worksheet

Submit completed worksheet in Brightspace

NAME: _____

Instructions: Work through each section of the interactive lab. Use label reveals, quick checks, and reference links to guide your observations. Record answers here and submit in Brightspace.

Part 1: Skeletal Muscle (H&E)

Stain: H&E — nuclei = dark purple/blue, cytoplasm & collagen = pink

Reference: bettybroadbent.com → Human Histology → Muscular Tissue → Skeletal Muscle

Longitudinal Section

1. Describe the arrangement of the muscle fibers. Are they parallel, branching, or random?

---

2. Where are the nuclei located in skeletal muscle fibers? What term describes this position, and why are they there?

---

3. Striations appear as alternating dark and light bands. Name the two bands and explain which protein(s) create each.

Cross Section

4. What shape do the muscle fiber profiles appear in cross section? Where are the nuclei relative to the cell edge?

5. Name the three connective tissue wrappings from innermost to outermost. Which one fuses to form the tendon?

6. What is a fascicle? Which CT wrapping surrounds it?

Part 2: Cardiac Muscle & Dense Irregular CT (Masson's Trichrome)

Stain colors you observe — fill in: Muscle = _____ Collagen = _____ Nuclei = _____

Reference: bettybroadbent.com → Human Histology → Heart Histology

Cardiac Muscle

7. How many nuclei does a typical cardiomyocyte have, and where are they located within the cell?

---

8. What is an intercalated disc? Describe its appearance and give its two functions (one mechanical, one electrical).

Dense Irregular CT — Fibrous Skeleton

9. In what directions do the collagen bundles run in the fibrous skeleton? Compare this to a tendon.

Part 3: Smooth Muscle & Elastic CT (Verhoeff Stain)

Stain: Verhoeff — elastin fibers appear _____ (color).

Reference: bettybroadbent.com → Blood Vessel Histology → Elastic Arteries AND Connective Tissues → Elastic CT

Smooth Muscle

10. Describe the shape and position of the smooth muscle nucleus. How does it differ from skeletal muscle nuclei (number per cell and position)?

Elastic CT — Arterial Wall

11. Name the three tunics from innermost to outermost. Which layer contains the smooth muscle?

---

12. What do the elastin fibers look like on Verhoeff stain? Why does their squiggly shape matter functionally?

Part 4: Dense Regular CT — Tendon (HistologyGuide)

Stain: H&E — navigate to HistologyGuide.com and open the tendon slide specified by your instructor.

Reference: bettybroadbent.com → Connective Tissues → Dense Regular CT

13. Describe the arrangement of collagen fibers in the tendon. How does this compare to the fibrous skeleton from Part 2?

---

14. What cells are visible between the collagen bundles? Are they fibroblasts or fibrocytes? How do you know?

Part 5: Mystery Tissues — Tissue Detective

Examine each mystery tissue image carefully. Use the clues if you need them, but try the identification first. Record your answers below.

Mystery Tissue A

I think this tissue is:

Three features that support my identification:

- Feature 1: _____
- Feature 2: _____
- Feature 3: _____

What stain appears to be used? What features tell you this?

Name one location in the body where this tissue is normally found.

Mystery Tissue B

I think this tissue is:

Three features that support my identification:

- Feature 1: _____
- Feature 2: _____
- Feature 3: _____

What stain appears to be used? What features tell you this?

Name one location in the body where this tissue is normally found.

Mystery Tissue C

I think this tissue is:

Three features that support my identification:

- Feature 1: _____
- Feature 2: _____
- Feature 3: _____

What stain appears to be used? What features tell you this?

Name one location in the body where this tissue is normally found.
