Worksheet for Morgan/Carter Laboratory #22
“Vertebrate Anatomy I – Tissues, Skin and Digestive System”

BE SURE TO CAREFULLY READ THE INTRODUCTION PRIOR TO ANSWERING THE QUESTIONS!!!

You will need to refer to your text book to answer some of the questions on this worksheet.

EXERCISE 22.1: Histology of the Skin

Procedure
1. Examine a prepared slide of the skin. Draw a picture in the box below and label the following parts: epidermis and stratified squamous epithelium; dermis; dense connective tissue; hair follicles; sebaceous glands; stratum corneum (surface layer of epidermis); stratum basale (lowest layer of epidermis just above the dermis); melanocytes (observable on “pigmented” skin slide); and sweat glands.

Results
In the table below, describe the function of each of the different parts of the skin below.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Function</th>
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<tbody>
<tr>
<td>Epidermis</td>
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<td>Dermis</td>
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<tr>
<td>Hair and hair follicles</td>
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<tr>
<td>Sebaceous glands</td>
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<tr>
<td>Sweat glands</td>
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<tr>
<td>Melanocytes</td>
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</table>
Discussion

1. How does the skin prevent dehydration? What structure is involved in this process?

2. How does the skin protect the body from bacterial invasion?

3. Discuss how each of the following helps to regulate body temperature:
   - Blood vessels –
   - Sweat glands –
   - Adipose (fat) tissue (below the dermis) –
   - Hair and hair follicles –

EXERCISE 22.2: Introduction to the Fetal Pig

Procedure
1. Examine the fetal pig and identify the following structures: head, neck, trunk, tail, thorax, abdomen, thoracic cavity, abdominal (peritoneal) cavity, external nostrils, auricle (ear), nictitating membrane (eye), epithrichium, umbilical cord, umbilical arteries, umbilical vein.

6.a. Which vessel – umbilical artery or umbilical vein – would carry blood high in oxygen? (Note: from where is the umbilical artery/vein coming from???)
6.b. Which vessel would carry blood that is **low** in oxygen? (Note: from where is the umbilical artery/vein coming from???)

6.c. Which of those vessels would carry blood that is **high** in nutrients? (Note: from where is the umbilical artery/vein coming from???)

6.d. Which of those vessels would carry blood that is **high** in metabolic wastes e.g. carbon dioxide and nitrogenous waste compounds? (Note: from where is the umbilical artery/vein coming from???)

7. Look just caudal (toward the anus) of the umbilical cord to determine the gender of your pig. If it is male you will see a **urogenital opening** in this position – the **scrotal sacs** will be present. If the pig is female, you will note the **labia** that surrounds this opening and the **genital papilla**.

Results

1. List the structures observed in the fetal pig that are **no longer present** after birth.

Discussion

What is meant by the term **cephalization** and how is this represented in the pig?

**EXERCISE 22.3: The Digestive System of the Fetal Pig**

Follow the instruction for dissection of the fetal pig. Be sure to **identify and know** all of the structures listed on the Exercise #22 Study Guide that can be downloaded from the Biology 7 website.
Procedure

7. On the picture below, label the parts of the cross-section through the intestine.

- lumen of the intestine
- villi
- simple columnar epithelial cells
- loose fibrous connective tissue
- lymph nodules
- longitudinal muscle layer
- circular muscle layer

Results

1. In lab topics #18 and #19, you learned that the digestive tract of many invertebrates is described as a “tube within a tube” – a tubular digestive tract within a “tubular” body. You also concluded that the pig digestive tract has a tubular design. Which structures and organs of the pig digestive system develop as tubes or chambers within its tubular digestive tract?

2. Which organs in the digestive system lie outside the “digestive tube” but are still important in the digestive process?
Discussion

1. Conservation of water is a critical problem faced by terrestrial organisms. Given the water requirements for digestion, how is the digestive tract anatomy adapted to life on land?

2. Speculate about the outcome if food passes too slowly or too rapidly through the colon (large intestine).

REVIEWING YOUR KNOWLEDGE

Refer to your text book Chapter 41 to answer the questions in this table.

<table>
<thead>
<tr>
<th>Organ</th>
<th>Function</th>
<th>Molecule Digested and the Enzyme Involved</th>
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