Exam #2 Test Prep

- Cytology – Part 2
  - What is resting membrane potential?

    electrical potential energy produced by separation of oppositely charged particles across plasma membrane in all cells

    - What ions are involved?

      potassium and sodium ions

    - What maintains the resting membrane potential?

      sodium-potassium pump

  - What is the difference between membranous and nonmembranous organelles?

    membranous organelles- are enclosed by a phospholipid bilayer and are not a part of the cytoplasm

    nonmembranous organelles- are not enclosed in a membrane and are part of the cytoplasm

    - Membranous organelles
      - Nucleus - contains genetic information used for the synthesis of cellular proteins, has three parts:
        - nuclear envelope
        - nucleolus
        - chromatin
      - Mitochondria - produce ATP by aerobic respiration, contain their own genetic information, resemble bacteria
      - Endoplasmic Reticulum
        - smooth ER: no ribosomes, functions in lipid synthesis and detoxification
        - rough ER: has ribosomes, site for protein synthesis
      - Golgi Apparatus -packages proteins and lipids received from the rough ER (endoplasmic reticulum)
      - Peroxisomes - detoxifying substrates that neutralize toxins and play a role in the breakdown and synthesis of fatty acids
      - Lysosomes - contain digestive enzymes for bacteria, viruses, toxins, degradation of nonfunctional organelles
    - Nonmembranous organelles
      - Ribosomes - site of protein synthesis (can be both free or membrane bound)
      - Cytoskeleton - a network of microtubules/microfilaments that play a roll in movement of cellular compounds
      - Centrioles - involved in cell division and help control cytoskeleton

- What is DNA Replication?

  happens prior to cell division while the cell makes a copy of a DNA, this makes an exact replica

  - When does DNA replication take place?

    interphase

  - What is the difference between mitosis and cytokinesis?

    Mitosis - division of nucleus, duplicated DNA is distributed to new daughter cells

    - prophase
    - metaphase
    - anaphase
    - telophase

    Cytokinesis - division of the cytoplasm and the creation of two new cells

  - Transcription - Nucleus
    - Initation:
    - Elongation:
    - Termination:

  - Translation - Ribosome
    - Initiation:
    - Elongation:
    - Termination:

- What are the three types of RNA? And what are their purposes?
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- Histology
  - What is a tissue?
  - Epithelium
    - What are the 5 special characteristics of epithelium?
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      -
    - How do we classify epithelia?
    - Simple Squamous Epithelium
    - Simple Cuboidal Epithelium
    - Simple Columnar Epithelium
    - Pseudo-stratified Ciliated Columnar Epithelium
    - Stratified Squamous Epithelium

- Stratified Cuboidal Epithelium

- Stratified Columnar Epithelium

- Transitional Epithelium

- Glandular Epithelium
    - Endocrine -
    - Exocrine -
        - Unicellular Exocrine Glands -
        - Multicellular Exocrine Glands -
            - Merocrine -
            - Holocrine -
            - Apocrine -

Connective tissue

- What are the characteristics of connective tissue?

- What are the functions of connective tissue?

- What are the structural components of connective tissue?

- Loose connective tissue
    - Adipose
        - White fat -
            -

        - Brown fat -

        - Areolar
            -
            -
            -
        - Reticular
            -
            -

- Dense connective tissue
    - Dense regular
        -
        -
        -
    - Dense irregular
        -
        -
        -
        -
    - Elastic
        -
        -

- Cartilage
    - **Hyaline cartilage**
        -
        -
        -
    - **Elastic cartilage**
        -
        -
    - **Fibrocartilage**
        -
        -

- **Bone (osseous tissue)**
    -
    -

- **Blood**
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Muscle tissue

- What is the function of muscle?
- What is the structure of muscle?
- Skeletal Muscle
- Cardiac Muscle
- Smooth Muscle

Nervous tissue

- What are the functions of nervous tissue?
- What are the two types of cells in nervous tissue?

- What are the three types of membranes?
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- What are the steps of tissue repair?

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- Integument
  - What is the function of the integumentary system?

  - Epidermis

    What are the 4 types of cells found in the epidermis?

    - Layers of the epidermis
    - **1) Stratum Basale**

    - **2) Stratum Spinosum**

    - **3) Stratum Granulosum**

        - **4) Stratum Lucidium**
        - **5) Stratum Corneum**

    - Dermis

        - **1) Papillary Layer**
        - **2) Reticular Layer**

    - Skin Color
        - **Melanin**
        - **Carotene**
        - **Hemoglobin**

- Skin color is a blend of the 3 pigments as influenced by *genetics* and *environment*

- Hair
  - Consists of dead keratinized cells

Functions:

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Structure of a **hair**:

- Regions:
  - **Shaft**:
  - Three parts of hair *shaft*:
    - **Medulla**:
    - **Cortex**:
    - **Cuticle**:
    - **Root**:

Structure of a **hair follicle:**

- Extends from epidermal surface to dermis
- **Hair bulb:**
- **Hair follicle receptor** (or **root hair** plexus):
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- **Hair matrix:**
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- **Arrector pili muscle:**
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    - Responsible for “goose bumps”
- **Hair papilla**
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- Nails
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- Structure:
  - **Nail matrix:**
  - **Nail folds:**
  - **Eponychium:**
  - **Hyponychium:**
    - *Lunule*: thickened nail matrix, appears white

- Glands
  - **Sebaceous gland -** (oil) *exocrine* glands usually found in association with a hair
  - **Sudoriferous gland** - (sweat) a mixture of water, salts and organic waste
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    - Two main types:
    - **Eccrine (merocrine)**
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      -
    - **Apocrine**
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      - Modified apocrine glands
        - **Ceruminous glands:** lining of external ear canal; secrete cerumen (earwax)
        - **Mammary glands:** secrete milk

- Identify the 3 types of skin cancer
  - **1) Basal Cell Carcinoma**
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- **2) Squamous Cell Carcinoma**
- **3) Melanoma**
- Key to survival is early detection: **ABCD rule**
    - Asymmetry ; the two sides of the pigmented area do not match
    - Border irregularity ; exhibits indentations
    - Color ; contains several colors (black, brown, tan, sometimes red or blue)
    - Diameter ; larger than 6 mm (size of pencil eraser)

- Distinguish between the degrees of burns
    - First Degree
    - Second Degree
    - Third Degree
    - >25% of body has second-degree burns
    - >10% of body has third-degree burns
    - Face, hands, or feet bear third-degree burns