

Intercellular Junctions

- All cells except blood are anchored to each other or to the matrix surrounding them by intercellular junctions

1

Tight Junctions

- Tight junctions completely encircle the cell joining it to surrounding cells
 - zipperlike pattern of complementary grooves & ridges
 - prevents substances and bacteria from passing between... cells
 - found in GI and urinary tracts

Tight Junction enlarged

2

Desmosomes

- Patch between 2 cells holding them together against mechanical stress
 - gap between cells is spanned by mesh of filaments terminating on a thick protein plaque
 - cytoplasmic intermediate filaments also attach to plaque
- Does not encircle the cell
- Common in uterus, heart and epidermis

enlarged

3

Gap Junctions

- Known as communicating junctions
- Ring of 6 transmembrane proteins form a water-filled channel
- Small solutes pass directly from cell to cell for electrical signals
- Found in embryos, cardiac & smooth muscle

Gap Junction

4

Endocrine & Exocrine Glands

Exocrine Gland: Secretes Substance onto a Surface, Usually Through a Duct

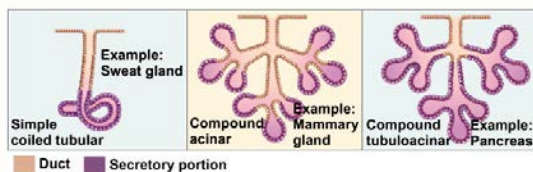
Endocrine Gland: Secretes Substance Into the Bloodstream.

5

Exocrine Gland Structure

6

Types of Exocrine Glands



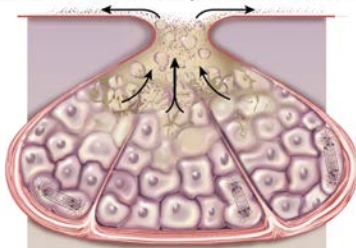
7

Types & Methods of Secretion

- Serous glands
 - produce thin, watery secretions
 - sweat, milk, tears & digestive juices
- Mucous glands
 - produce a glycoprotein, mucin that absorbs water to form a sticky secretion called mucus
- Mixed glands contain both serous & mucous cells
- Cytogenic glands release whole cells
 - sperm and egg cells
- Variations in methods of cellular secretion

8

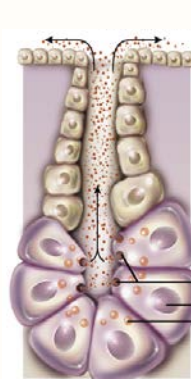
Holocrine Gland



- Secretory cells disintegrate in order to deliver their accumulated product & some cell fragments
- Oil-producing glands of the scalp are an example

9

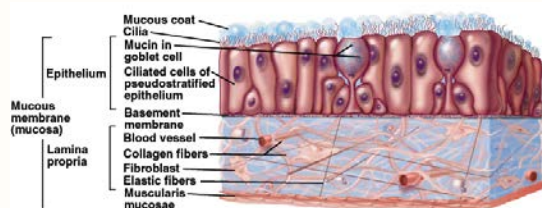
Merocrine & Apocrine Secretion



- Merocrine glands release their product by exocytosis
 - tears, gastric glands, pancreas, etc.
- Apocrine glands are really merocrine glands but confusing appearance (apical cytoplasm not lost as used to be believed)
 - mammary & armpit sweat glands

10

Mucous Membranes



- Consists of epithelium, lamina propria & muscularis mucosae
- Lines passageways that open to the exterior: digestive, respiratory, urinary and reproductive
- Mucous coating & movement of cilia trap & remove foreign particles & bacteria from internal surfaces of body

11

Cutaneous, Synovial & Serous Membranes

- Cutaneous membrane (skin) – external body surface
 - stratified squamous epithelium resting on layer of connective tissue
 - relatively dry layer serves protective function
- Synovial membrane lines joints (only connective tissue comprises this layer)
 - secretes synovial fluid rich in hyaluronic acid into the joint
- Serous membrane (serosa) – internal membrane
 - simple squamous epithelium and areolar tissue covers organs and walls of body cavities, produces serous fluid
 - endothelium lines blood vessels and heart
 - mesothelium lines pleural, pericardial and peritoneal cavities

12

Changes in Tissue Types

- Tissues are capable of changing from one type to another
- Differentiation
 - unspecialized tissues of embryo to specialized mature types (mesenchyme to muscle)
- Metaplasia
 - changing from one type of mature tissue to another
 - simple cuboidal tissue before puberty changes to stratified squamous after puberty

13

Tissue Growth

- Hyperplasia is tissue growth through cell multiplication
- Hypertrophy is enlargement of preexisting cells
 - muscle grow through exercise
- Neoplasia is growth of a tumor (benign or malignant) through growth of abnormal tissue

14

Tissue Shrinkage and Death

- Atrophy is shrinkage from loss of cell size/number
 - senile atrophy is due to aging
 - disuse atrophy from lack of use (leg in a cast)
- Necrosis is pathological death of tissue
 - gangrene is due to insufficient blood supply
 - gas gangrene is due to anaerobic bacterial infection
 - infarction is sudden death of tissue from lack of blood
 - decubitus ulcer is bed sore or pressure sore
- Apoptosis is programmed cell death
 - cells shrink & are phagocytized (no inflammation)
 - webbing between fingers, uterus after delivery, earlobes

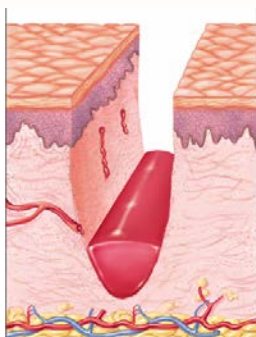
15

Tissue Repair

- Damaged tissues are repaired in 2 ways:
- Regeneration
 - replacement of dead or damaged cells with original cells
 - restores normal function
 - skin injuries & liver regenerate
- Fibrosis
 - replacement of damaged cells with scar tissue (collagen)
 - helps hold organ together -- function is not restored
 - healing muscle injuries, scarring of lung tissue in TB or healing of severe cuts & burns of the skin
 - keloid is healing with excessive fibrosis (raised shiny scars)

16

Wound Healing of a Laceration

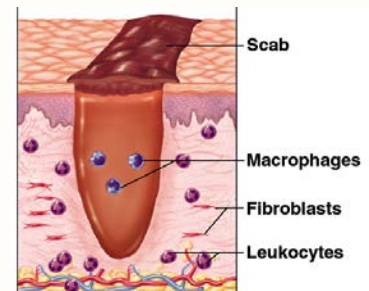


- Damaged vessels leak blood
- Damaged cells & mast cells leak histamine
 - dilates blood vessels
 - increases blood flow
 - increases capillary permeability
- Plasma seeps into wound carrying antibodies, clotting factors & WBCs

17

Wound Healing of a Laceration

- Clot forms
- Scab forms on surface
- Macrophages start to clean up debris

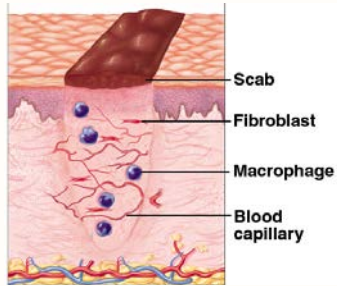


Scab formation & macrophage activity.

18

Wound Healing of a Laceration

- New capillaries grow into wound
- Fibroblasts deposit new collagen to replace old material
- Fibroblastic phase begins in 3-4 days & lasts up to 2 weeks

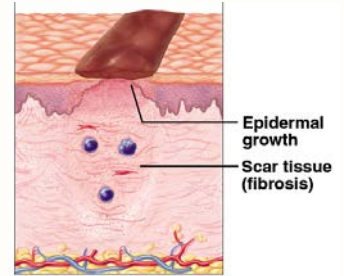


Formation of granulation tissue.

19

Wound Healing of a Laceration

- Surface epithelial cells multiply & spread beneath scab
- Scab falls off
- Epithelium grows thicker (regenerates)
- Connective tissue forms only scar tissue (fibrosis)
- Remodeling phase may last 2 years



Epithelial regeneration & connective tissue fibrosis.

20