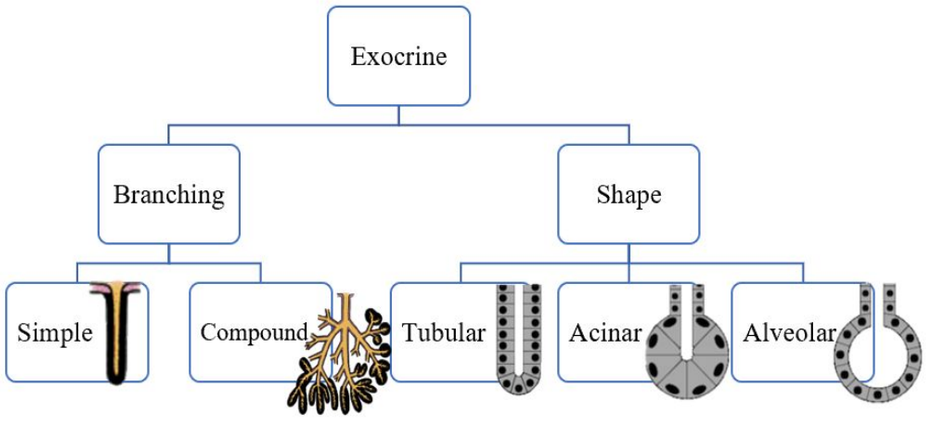
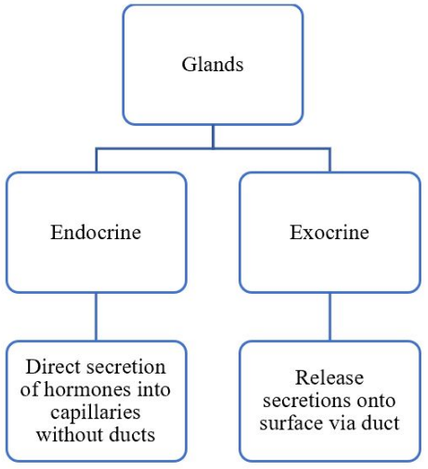
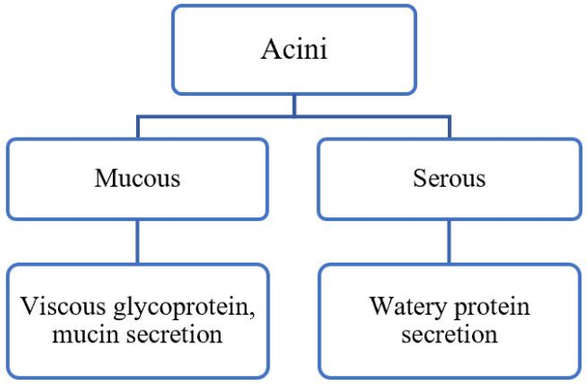
Epithelium: Epithelium covers and lines outer surface of organs as well as inner surface of cavities. Composition of epithelium differs depending on role in the body. BDS 1 students should be familiar with the relationship between structure and functions of oral mucosa and salivary glands. Knowledge of layers of epithelium in relationship to needlestick protocol is also of importance.







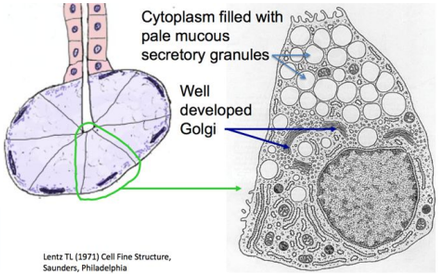
1. Secretion into the immediate environment
- Exocrine vs. endocrine

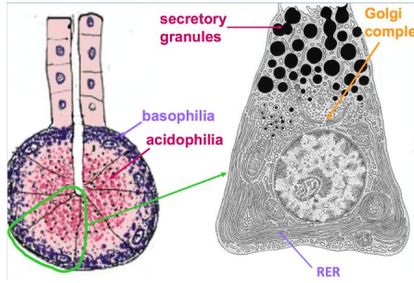
2. Single cells or **acinic** clusters

3. Located deep in surface epithelium within CT or discrete glandular organs

Epithelial cells that produce and release a secretion that differs composition from tissue fluid or blood
e.g. mucus, gastric secretion, sebum milk

Glandular

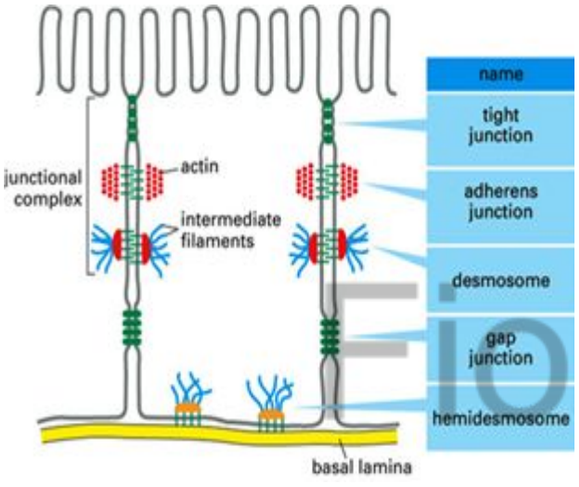


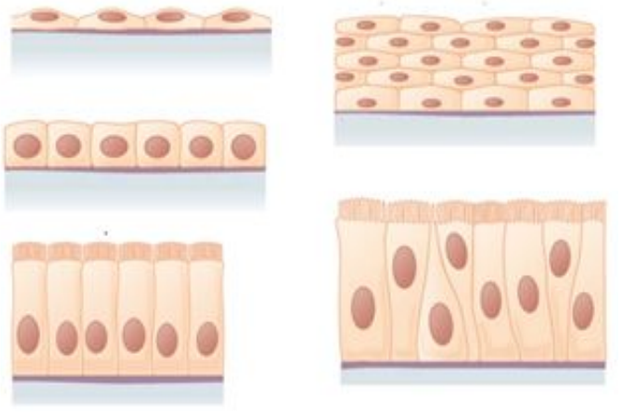


Surface Specialisation	Structure	Function
Microvilli	• Finger-like projections	• Increase SA
Cilia	• Microtubule core	• Processes beat in unison
Stereocilia	• Similar to microvilli but branched	• Mechanosensing in inner ear
Tight Junction	• Transmembrane proteins pair up from each cell • Junctional adhesion molecule – JAM	• Seals intercellular space and barrier between two environments • Prevent gut lining damage by digestive secretions in lumen
Zonula Occludens (junction complex)	• Modified tight junction	• Attach cells to all neighbours • Prevent flow between cells
Desmosome	• Plaque proteins attach to intermediate filaments in cytoplasm • Localised site of attachment	• Strong attachment that holds adjacent cells together against stress • Intercellular space not sealed
Zonula Adherens (junction complex)	• Modified desmosome • Linked to actin cytoskeleton	• Hold adjacent cells in cell proximity • Not completely blocked
Gap/Communicating Junction	• Adjacent transmembrane channels (connexons) in cells pair up	• Passage of small water-soluble ions and molecules between cell cytoplasm • Allows for: o Sheet of epithelial cells to function in unison o Cell to cell communication o Ionic coupling
Hemidesmosome	• Similar to half-desmosome • Protein plaque links to both intermediate filaments and transmembrane protein integrins	• Cell-matrix adhesion at basal surface • Provides immobility to gingival epithelium – enable strong attachment to underlying CT

Surface

1. Covers and lines all natural surfaces of body
2. Protective barrier layer
3. Interface b/w 2 different environments
4. Control passage of substances





Simple	Transport between environments
Cuboidal/columnar	Facilitate and support absorptive and secretory functions (room for organelles)
Squamous	Minimal distance to facilitate diffusion
Stratified	Protective barrier function Associated with squamous cells as ↑ layers for overall epithelial thickness
Microvilli	High SA for absorption
Cilia	Movement