Oral mucous membrane

The surface of oral cavity is a mucous membrane it structure varies in adaptation to function in different regions of the oral cavity.

Basic classification of OMM divided into 3 major Types :-

1- Masticatory mucosa (gingiva and hard palate).

2- Lining mucosa (lip , cheek , vestibular fornix , alveolar mucosa , floor of the mouth and soft palate).

3- Specialized mucosa (dorsum of tongue and taste buds).

The structure of OMM resemble skin composed of :-

1- Epithelium

2- Connective tissue (lamina properia)

The two layers form an interface that is folded into corrugations. Papilla of C.T protrude toward epi. Carrying blood vessels and nerves . the epi. In turn is formed into ridges that protrude toward the lamina propria which called epithelial ridges look like pegs.

There is a junction between epi. And L.p. called basal lamina which is epithelial in origin , seen at electronic microscopical level and it is called basement membrane when it is evident at light microscopical level .

It is a zone of 1 - 4 micron wide, cell free zone stain positive with periodic acid sniff method indicate it contains neutral mucopoly saccharides, also contains Fine orgyrophilic reticulin fiber .As well as special anchoring fibrils

1- Oral epithelium :-

Is stratified squamous epi. Either keratinized ,parakeratinized or non keratinized .

A common feature of all epi. Cell is that they Contain keratin intermediate filaments as a component of their cytoskeleton. so the oral epithelial cells are **called keratinocyte** , cells are tightly packed to each other and are arranged in layers or (strata), epi. Cells have ability for turn over (renewal) which means replacement of desquamate cells from the surface by new migrating epi. Cells that produced by mitotic activity in the deepest layers .

Keratinized oral epi. Consist of 4 layers :-

1- Stratum basale
2- Stratum spinosum
3- Stratum granulosum
4- Stratum corneum

Take their name from their morphological appearance

1- Basal cell layer (bcl) :- is made up of cells that synthesize DNA cells and under go mitosis providing new cells .

New cells are generated in the basal layer.However, some mitotic figures may be seen in the spinous cells just beyond the basal layer.*The* basal cells and the parabasal spinous cells are referred as stratum germinativum . Basal cell layer made up of two populations.

1- Serrated , heavily packed with tonofilamints adapted for attachment. It is a single cuboid layer have specialized attachment with c.t. called hemidesmosome .
2- Non serrated composed of slowly cycling stem cells give rise to a population of cells

amplified for cell division .

The basal cell contain tonofilaments attached to the attachment plques,beside that there are many types of cell junctions such as tight, close , gap junction . Basal cell synthesis protein of basal lamina , and synthesize protein that form intermediate filament of basal cell .

2-straturm spinosum (princkle cell layer}

Cell are irregular, polyhedral about 20 - 25 layer and larger than b.c.l. cells , on light level cells joined by intercellular bridges . Tonofrils seem to course from cell to cell across these bridges.

The intercellular spaces contain glycoprotein , glycosaminoglycans and fibronectin . the intercellular spaces of sp.cells in keratinize epi. are larger or distended make desmosomes more prominent and given the cells a prickly appearance.

3- Stratum granuiosum: flatter and wider cells , these cells are larger than str. Sp. L. it's named for their basophilic keratohyalin granules (blue stain with H &E).

The nucleus show signs of degeneration and pyknosis , this layer still synthesize protein indifferent level and rate , as approaches the str. Cornium , the rate of protein synthesis diminishes , tono-filaments are more dense in quantity associated with kertohyalin granules .

Odland bodies :- the lamellar granule , small organelle known as keratinosome , odland body or membrane coating granule forms in upper spinous and granular cell layers, it has an internal lamellated material which contributes of the permeability barrier. this barrier forms at the junction of granular and Cornified layers . In non keratinized epi. Small organelle similar to odland bodies are present but are granular rather than lamellar, have similar function .

4- Stratum cornium :- is made up of kertinized squamae with larger and flatter cells than str. Granuiosum , nuclei and organelles are disappeared , the layer is larger acidophilic amorphous , cells contain densely packed filaments developed from the tonofilament coated by basic protein filaggrin (named for it's function in filament aggregation).

Parakeratinized oral epi:-

It is similar to the keratinized in it's layers except that the granular layer may be absent or not evident, the other differences in the str. Cornium (cornified layer), the surface layer retain neucli that are pyknotic and condensed , and other partially lysed cell organelles until they desquamate .

Non - keratinized epi.

Have no cornified layer, therefore :-

1- Basal cell layer similar to those of keratinized epi

2- Stratum intermedium

3- Stratum superficial

Str. Intermedium :- cells are larger than spinosum , intercellular spaces not obvious , no prickle appearance attached by desmosomes cell surfaces are more closely applied than str. Spinous layer, no str. Granulosum

Str. Superficial:- they are nucleated flat cells exist at the surface ultimately desquamate and don't form keratin

In general non - keratinized oral mucosa have higher rates of mitosis than do the keratinized oral mucosa. Ortho, and parakeratosis are physiological terms while keratosis term refers **to pathological stages**

The non - keratiocyte cells

In oral epi. There are additional cells called non -keratocyte cells , they are melanocytes cells langerhans cells , merkel cell and lymphocyte and polymorphonuclear leukocyte cells

1.Melanocyte cells :- dendrities cells present in the basal cell layer store melanine in form of melanosomes which elaborate melanine pigment responsible for pigmentation of o. m. m. embryonic origin from n. c. c.

2.Langerhanes cell:- dendritic cell present in upper layer of si and mucosal epi. In the zone of ortho keratinzation in str. Granulosum derived from haemopoitic tissues (i. e. from bone marrow) involved in immune response

3.Merkels cell :- non - dendritic cell found in the basal eel! layer, it's origin from n. c. c. have nerve tissue presum to be specialized neural pressure sensetive receptor cell means

4.Lymphocytes and polymorphonuclear leukocyte cells lymphocyte originate from hemopoietic stem cell present in every type of epi. And in any layer of epi. It is associated with inflammatory response

2- Lamina properia

l.p. is a c.t. of variable thickness that supports the epi. It divided into

1- papillary part

2- reticular part

papillary have considerable variations in length width and depth a portion of papillary region near basement membrane it distinguished by it's more silver stain strongly have

argyrophilia which are immature collagen fibers have lattices like arrangement termed reticulin the configuration between blood vessels in c.t. means allow nutrition to un vascularized epi. And also to strengthen the attachment to the c.t. and serve for accurate sensory discrimination .L.p. may attach to periostem of alveolar bone or it may overlay submucosa

reticular part is also a c.t. contain net like collagen fibers and the basal layer (of the c.t.) contains large blood vessels lymph vessels and nerves the papillary part may be absent but the reticular part always present ex. In alveolar mucosa

submucosa

consist of c.t. of varying thickness and density it attaches mucosa membrane to the underlying structures weather attachment loose or firm depends on variety of submucosa .Glands, blood vessels , nerves and adipose tissue are present in submucosa

Functions of OMM

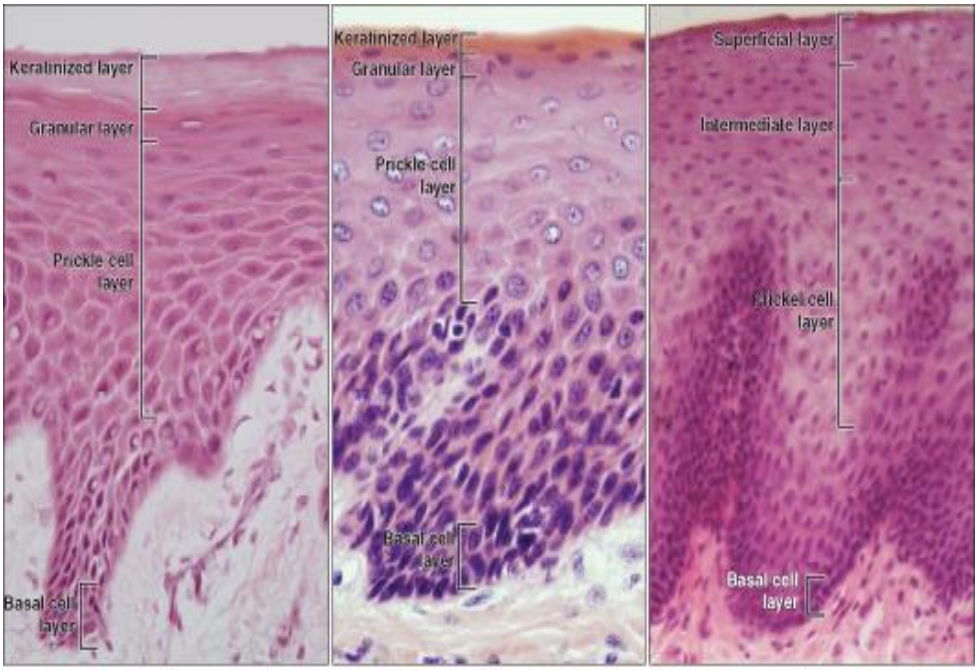
1- protection
2- sensation
3- secretion
4- thermal regulation

Types of Oral Epithelium

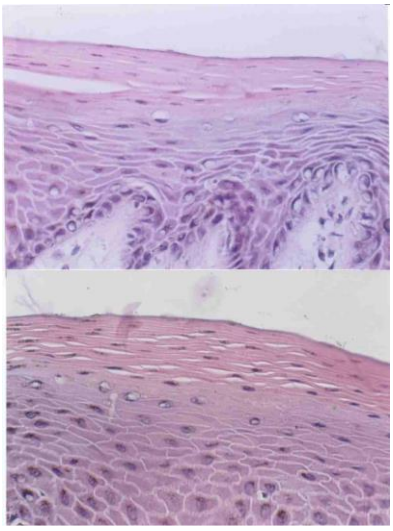
Orthokeratinized stratified squamous epithelium

Parakeratinized stratified squamous epithelium

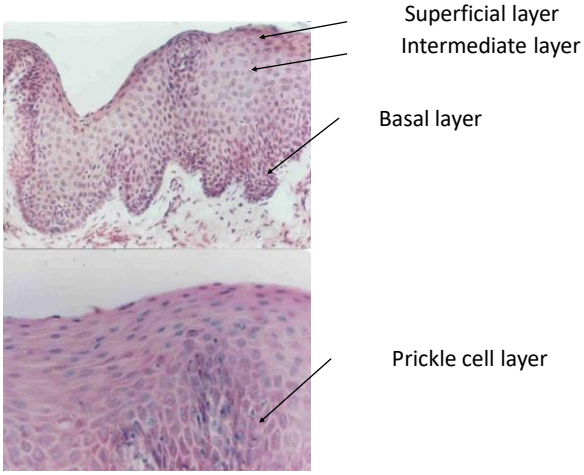
Nonkeratinized stratified squamous epithelium

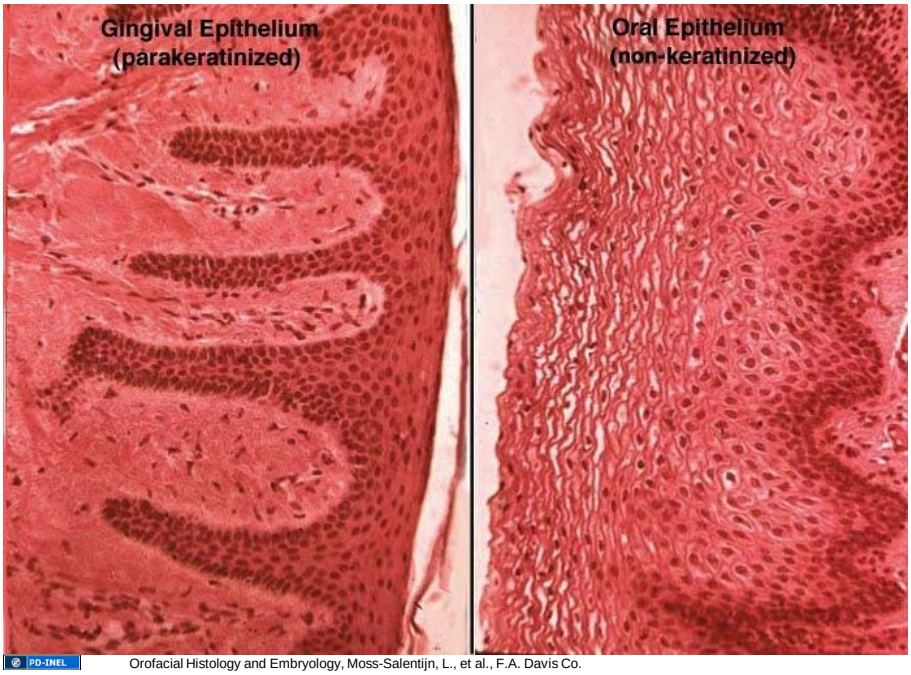


Parakeratinization of oral epithelium..



Non-Keratinization in oral epithelium in human gingiva..





Orofacial Histology and Embryology, Moss-Salentijn, L., et al., F.A. Davis Co.