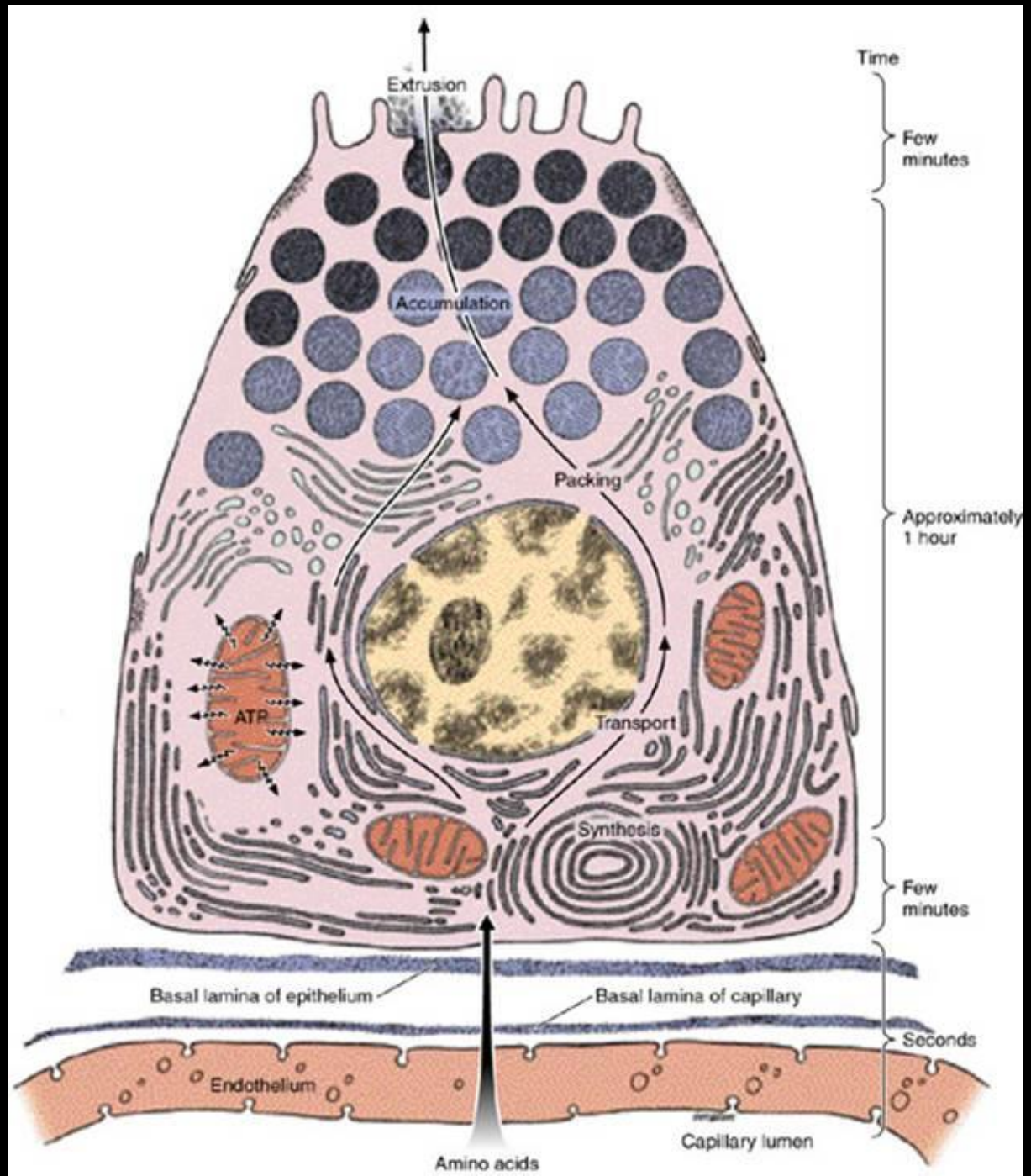
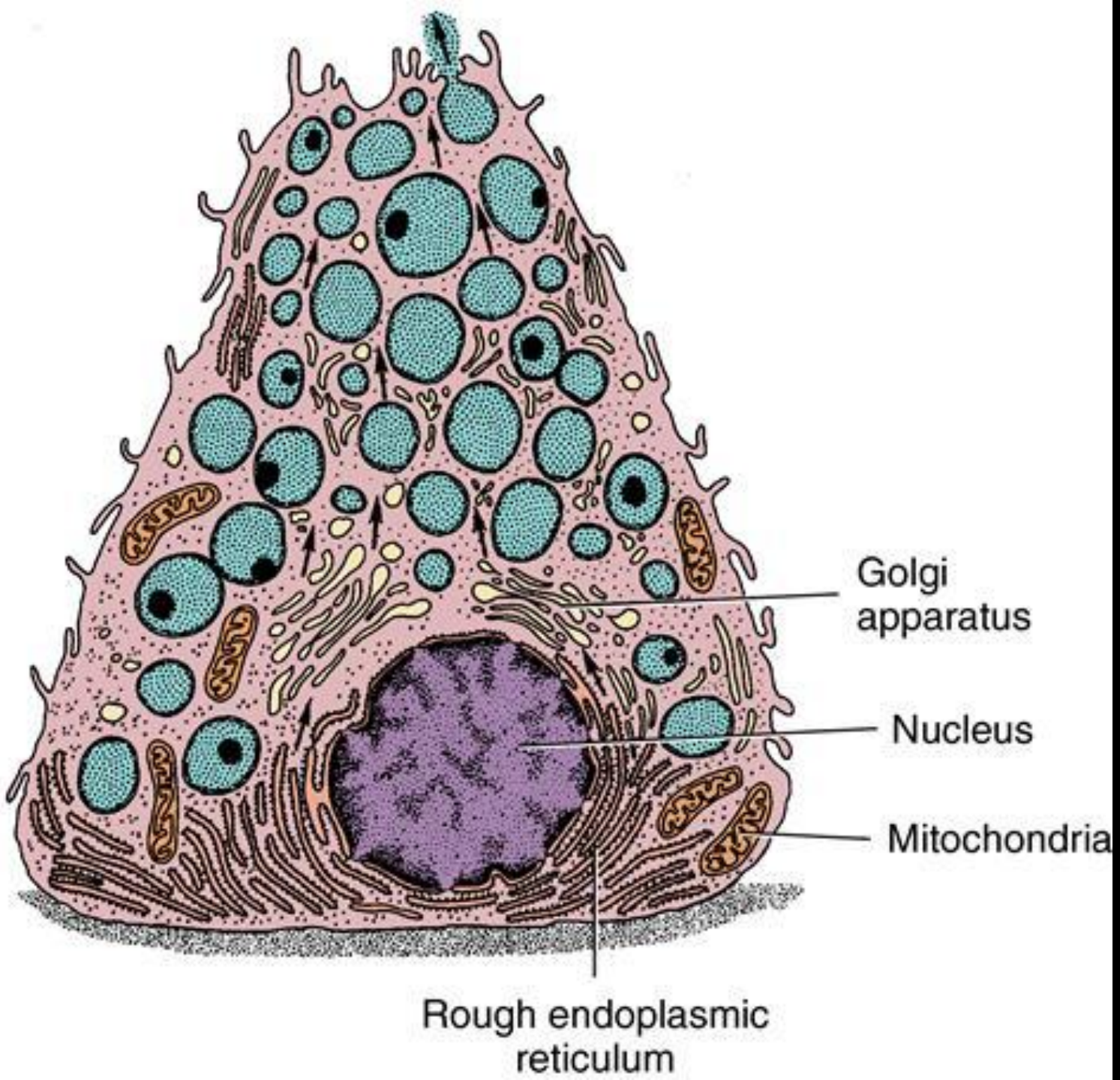
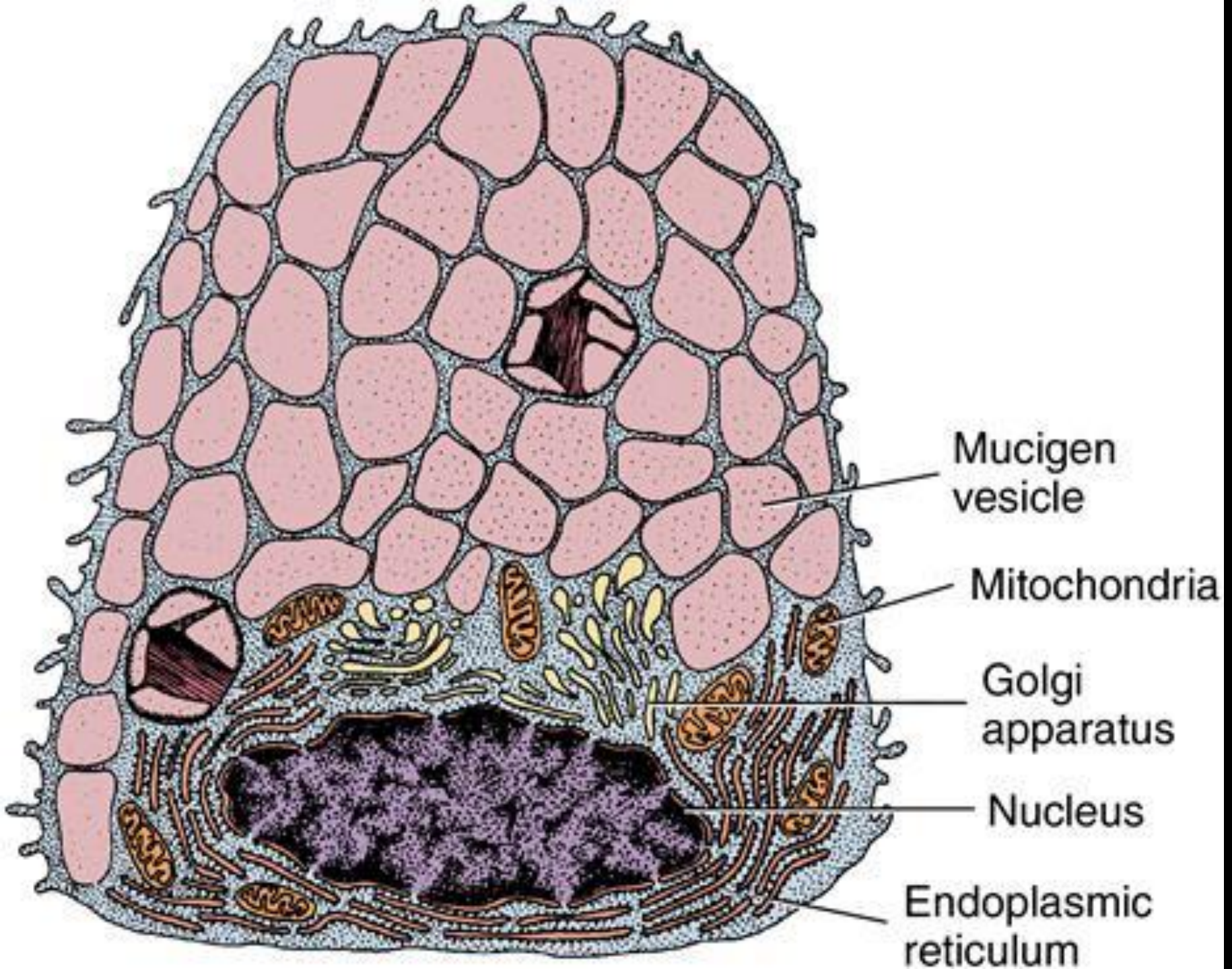
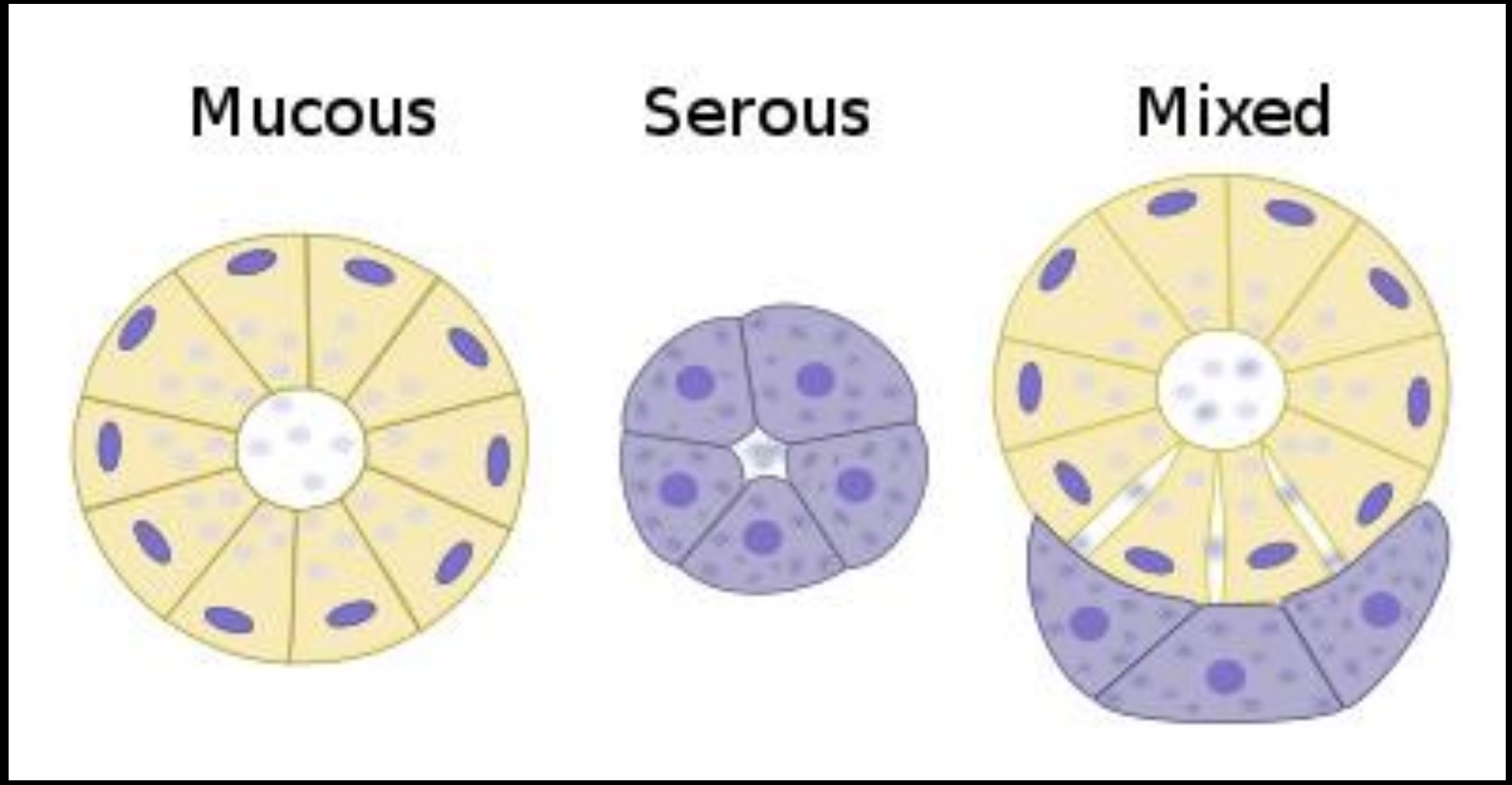
Salivary glands

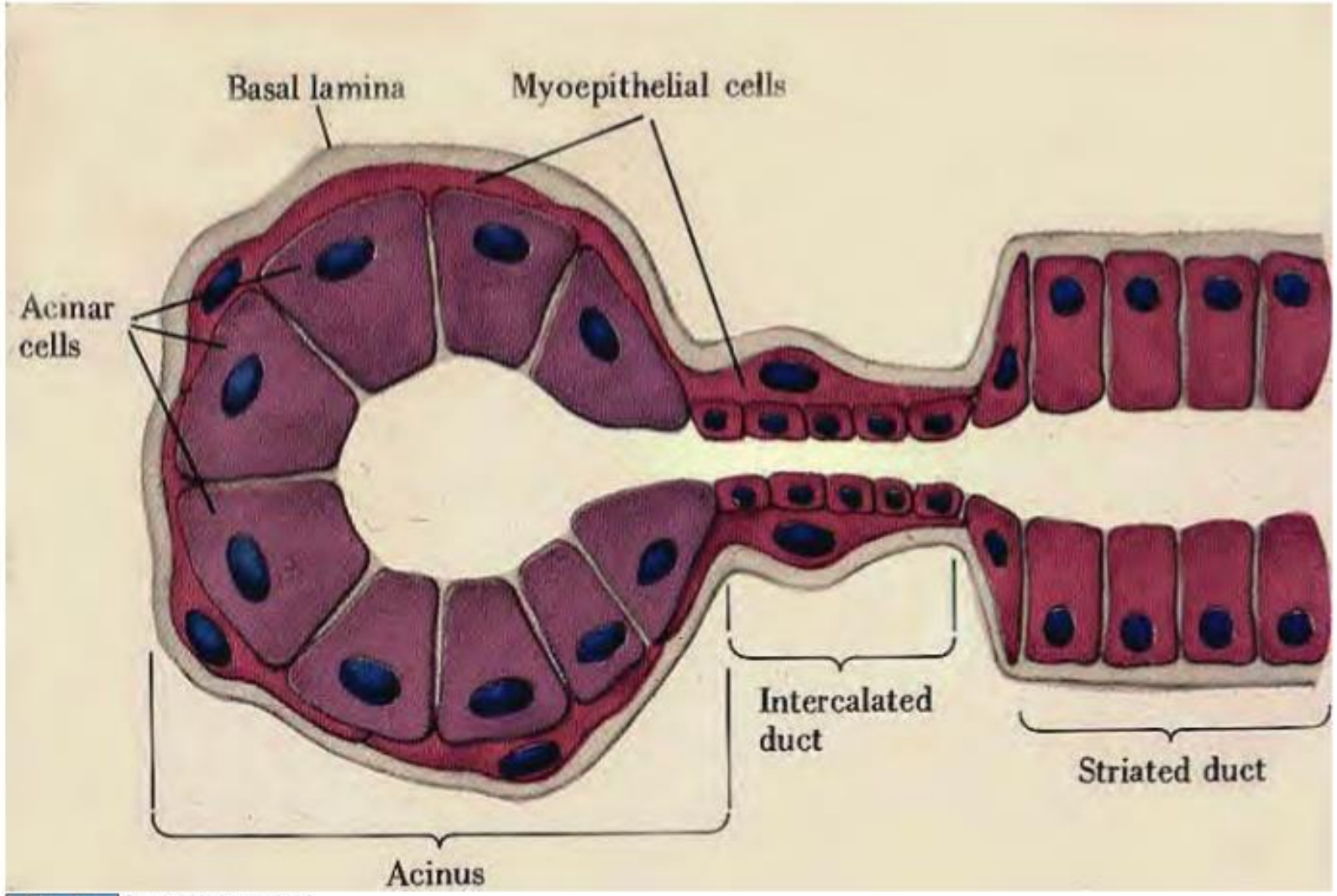

Time
Extrusion
Few minutes
Accumulation
Packing
Approximately 1 hour
ATP
Transport
Synthesis
Few minutes
Basal lamina of epithelium
Basal lamina of capillary
Seconds
Endothelium
Capillary lumen
Amino acids


Golgi apparatus
Nucleus
Mitochondria
Rough endoplasmic reticulum


Mucigen vesicle
Mitochondria
Golgi apparatus
Nucleus
Endoplasmic reticulum


Mucous
Serous
Mixed

Structural and functional Unit of Salivary Gland

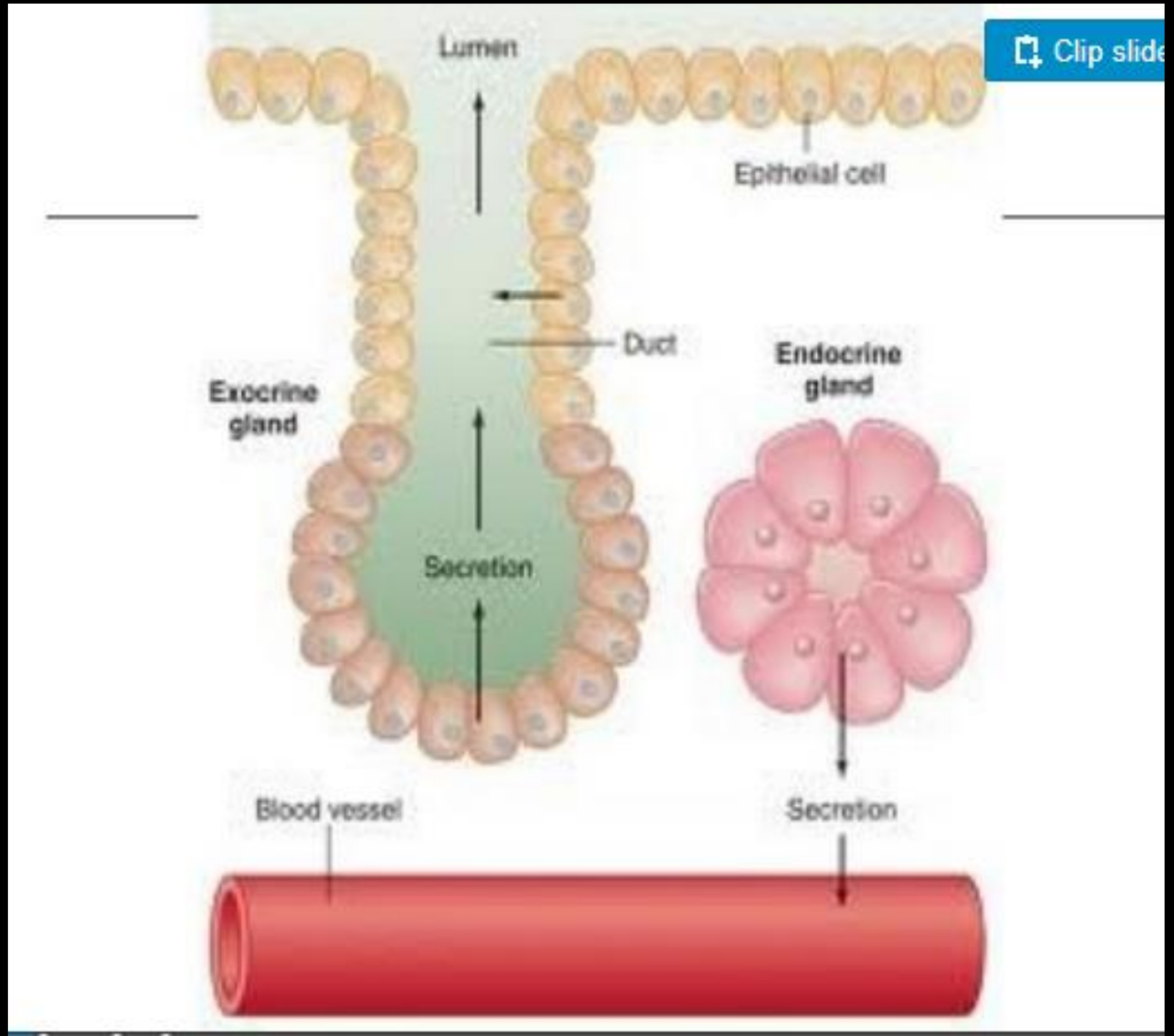


DEFINITONS

- ***GLAND**:* A GLAND IS A COLLECTION OF SPECIALISED CELLS INVOLVED IN THE PRODUCTION & DISCHARGE OF SECRETIONS REQUIRED FOR A PARTICULAR FUNCTION.
- ***SALIVARY GLANDS***: THEY ARE MULTICELLULAR, MEROCRINE, EXOCRINE GLANDS WHOSE SECRETIONS FLOW INTO THE ORAL CAVITY.

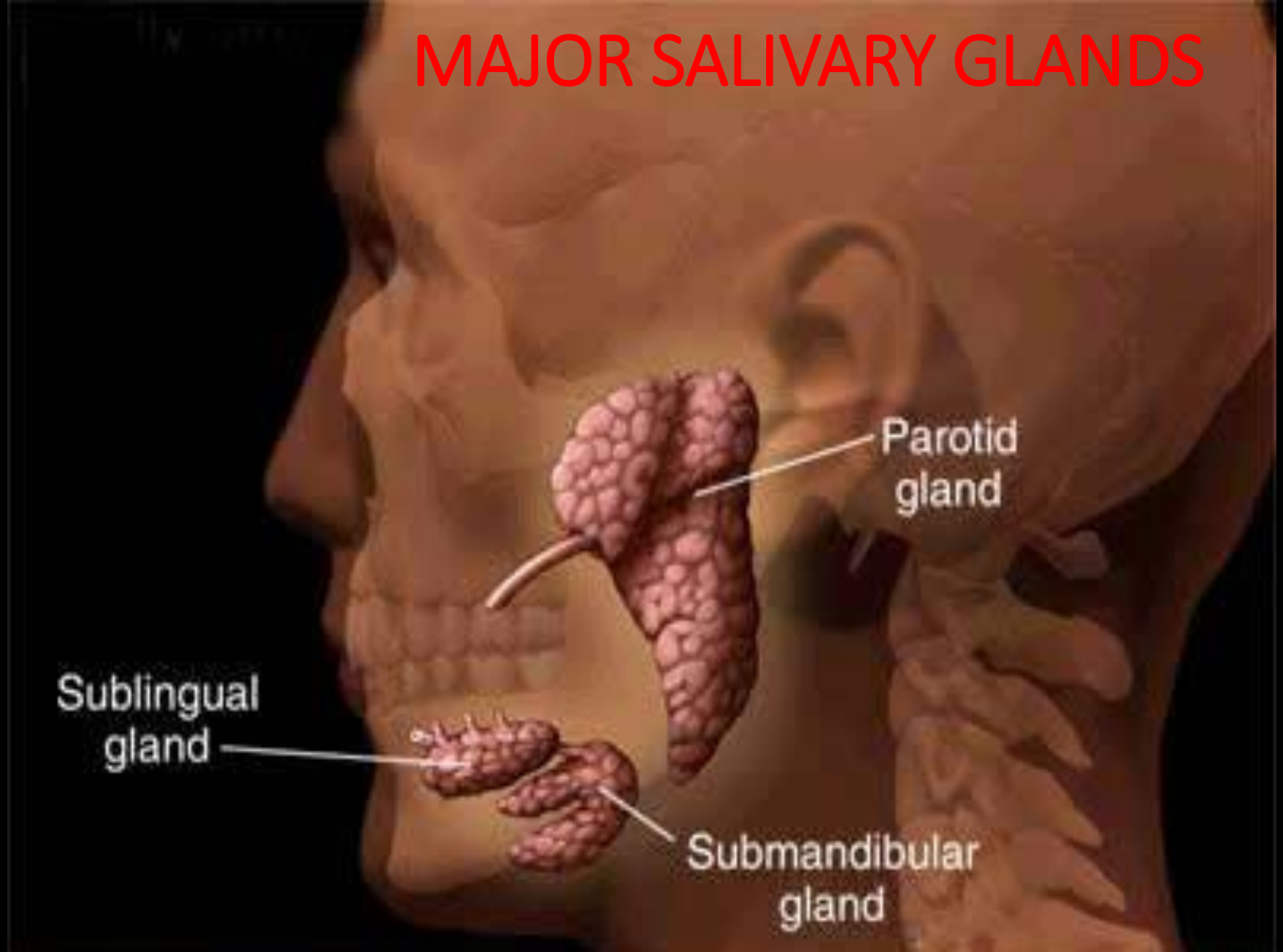
Classification of glands:

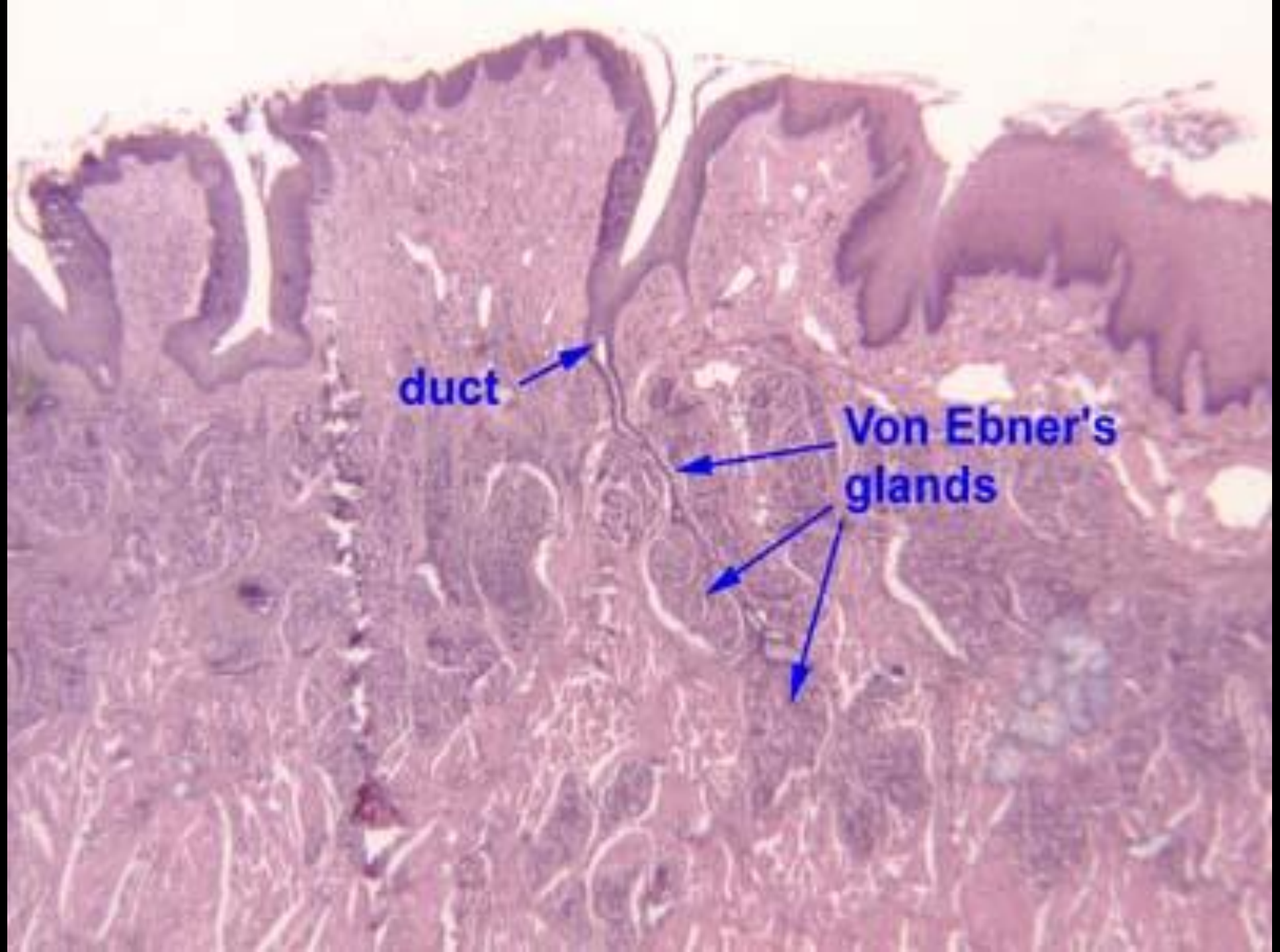
- Glands are generally classified into two major groups:
- Exocrine glands (Gr. Exo, outside,+ krinein, to separate) release their products onto an epithelial surface, either directly or through a duct e.g; the salivary glands.
- Endocrine glands (Gr, endon, within,+ krinein) release their products into the blood stream, e.g; thyroid gland.
- Mixed variety: some glands possess both exocrine and endocrine function e.g; pancreas.


Clip slide
Lumen
Epithelial cell
Duct
Exocrine gland
Endocrine gland
Secretion
Blood vessel
Secretion

- SALIVARY GLANDS ARE EXOCRINE GLANDS, WHOSE SECRETION FLOW INTO THE ORAL CAVITY.
- 3 PAIRS OF LARGE GLANDS- EXTRA ORALLY CALLED AS ***MAJOR SALIVARY GLANDS***
- NUMEROUS SMALL GLANDS– MUCOSA & SUBMUCOSA OF ORAL CAVITY– ***MINOR SALIVARY GLANDS***

MAJOR SALIVARY GLANDS




duct
Von Ebner's
glands


Labial salivary glands

FUNCTIONS OF SALIVA

I . ***PROTECTION***

- ***A. Lubrication***
- ***B. Lavage***
- ***C. Pellicle formation***
- ***D. Water proofing***

FUNCTIONS OF SALIVA

II. ***DIGESTION***

A. Bolus formation

B. Digestion of starch

C. Neutralization of esophageal contents

FUNCTIONS OF SALIVA

III. BUFFERING

A. Maintenance of P^H

B. Neutralization of acids

FUNCTIONS OF SALIVA

IV. TASTE

A. Solution of molecules

B. Taste bud growth and maturation

FUNCTIONS OF SALIVA

V. ANTIMICROBIAL

A. Antibodies

B. Hostile environment

FUNCTIONS OF SALIVA

- ***VI. TOOTH INTEGRITY***

A. Enamel maturation

B. Remineralization

C. Decreased susceptibility

FUNCTIONS OF SALIVA

VII. SOFT TISSUE REPAIR

A. Reduction in bleeding tissue

B. Increase in rate of wound contraction

C. Rate of wound healing enhances

D. Formation of blood clot

CLASSIFICATIONS

- **ACCORDING TO SIZE**:

a) **MAJOR**- PAROTID, SUBMANDIBULAR & SUBLINGUAL.

b) **MINOR**- LABIAL & BUCCAL GLANDS, GLOSSOPALATINE GLANDS, PALATINE GLANDS, LINGUAL GLANDS.

CLASSIFICATIONS

- **ACCORDING TO THE LOCATION**:

GLANDS WHOSE DUCTS OPEN IN THE VESTIBULE:

A***) LIP***- i) SUPERIOR LABIAL. ii) INFERIOR LABIAL

B***) CHEEK***– i) PAROTID ii) BUCCAL

CLASSIFICATIONS

- II) **GLANDS WHOSE DUCTS OPEN IN THE ORAL CAVITY PROPER:**

A) FLOOR OF THE MOUTH i)SUBMANDIBULAR ii) SUBLINGUAL iii)GLOSSOPALATINE

B) TONGUE a) BODY: ANTERIOR LINGUAL b) POSTERIOR LINGUAL (VON EBNER)

C) PALATE

CLASSIFICATIONS

- **ACCORDING TO SECRETION**

A) ***SEROUS***: i) PAROTID ii) VON EBNER

B) **MUCOUS** : i) PALATINE ii) GLOSSOPALATINE

C) **MIXED:** i)SUBMANDIBULAR ii) SUBLINGUAL iii) BUCCAL iv) LINGUAL

INTRODUCTION

- BOTH MAJOR & MINOR SALIVARY GLANDS ARE COMPOSED OF PARENCHYMAL ELEMENTS INVESTED IN & SUPPORTED BY CONNECTIVE TISSUE.

INTRODUCTION

- **PARENCHYMAL ELEMENTS** ARE DERIVED FROM ORAL EPITHELIUM

↓

TERMINAL SECRETORY DUCTS

↓

DUCTS

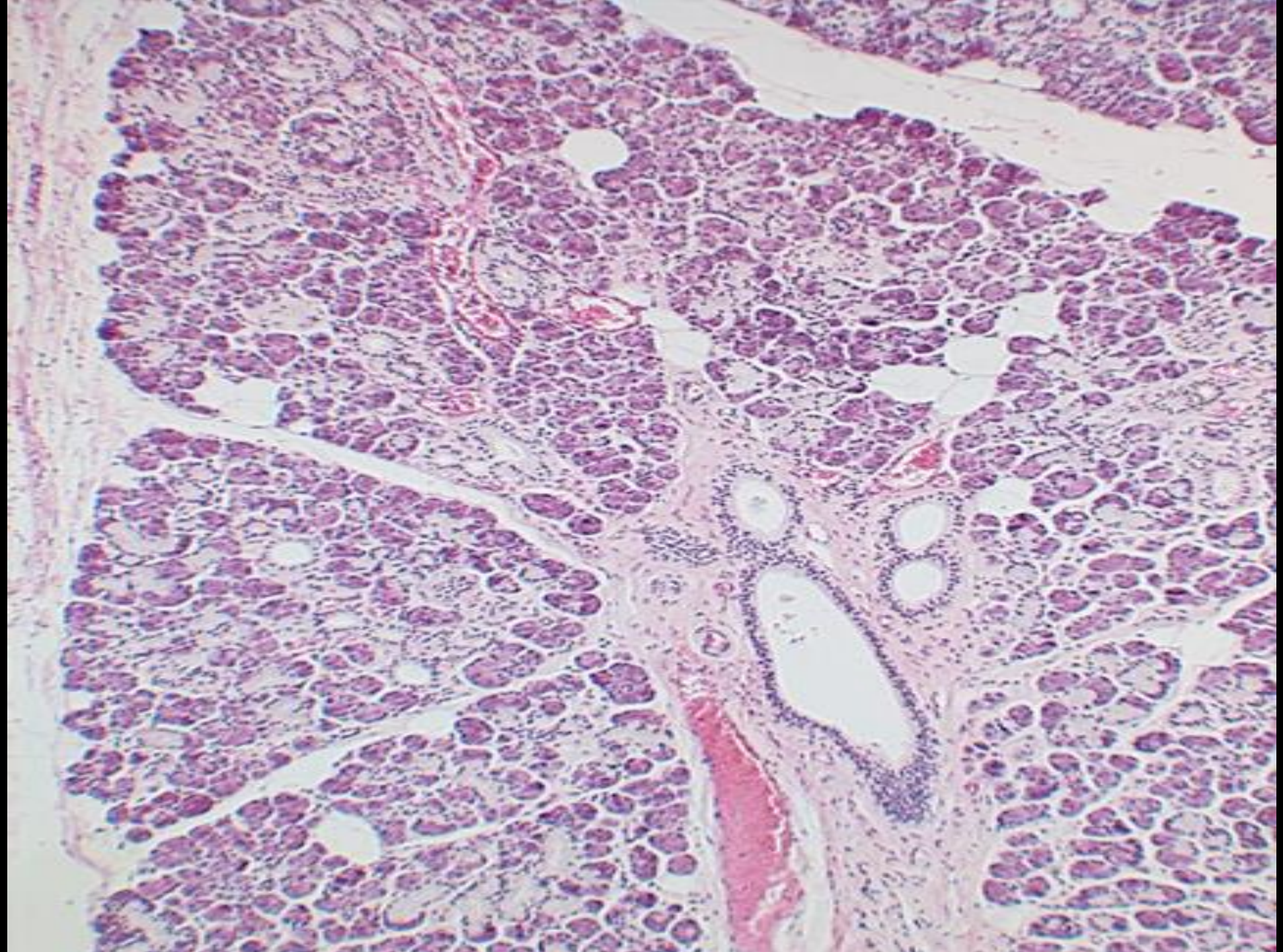
↓

OPEN INTO ORAL CAVITY

INTRODUCTION

- **CONNECTIVE TISSUE** FORMS A CAPSULE AROUND THE GLAND & EXTENDS INTO IT, DIVIDING GROUPS OF SECRETORY UNITS & DUCTS INTO LOBES & LOBULES.

BLOOD & LYMPH VESSELS & NERVES ARE PRESENT IN THE CONNECTIVE TISSUE.



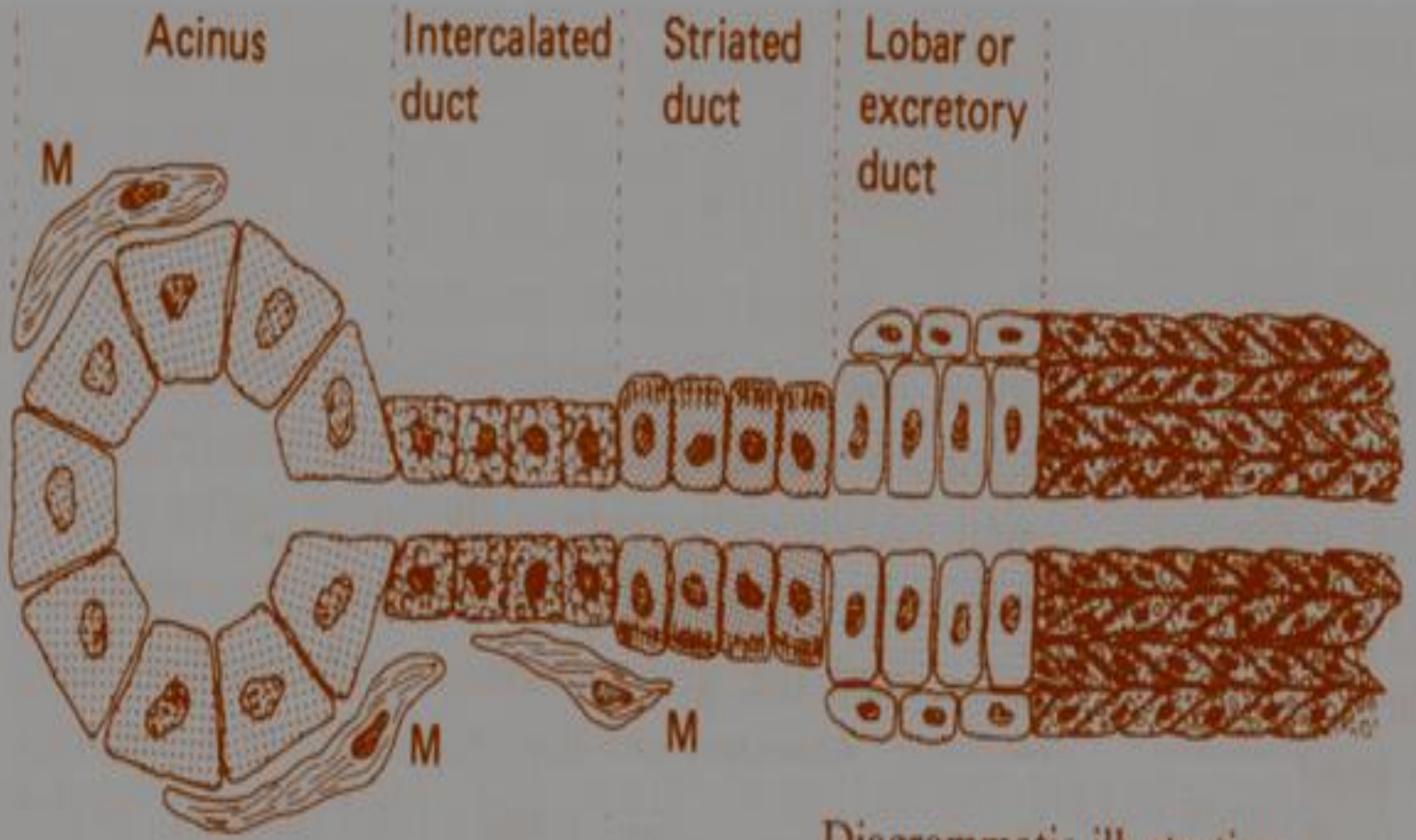
INTRODUCTION

- MAIN FUNCTION OF SALIVARY GLANDS IS TO PRODUCE SALIVA

SALIVA CONTAINS ORGANIC & INORGANIC SUBSTANCES PROVIDES NATURAL PROTECTION FOR THE TEETH & SOFT TISSUES OF THE ORAL CAVITY & ASSISTS IN MASTICATION, DEGLUTITION & DIGESTION OF FOOD.

MICROSCOPIC STRUCTURE

- **ACINAR REGION** : COMPRISES OF SERIES OF SECRETORY UNITS (ACINAR CELLS)
- DUCTS
- MYOEPITHELIAL CELLS



Diagrammatic illustration of a component of a major salivary gland. M, myoepithelial cell.

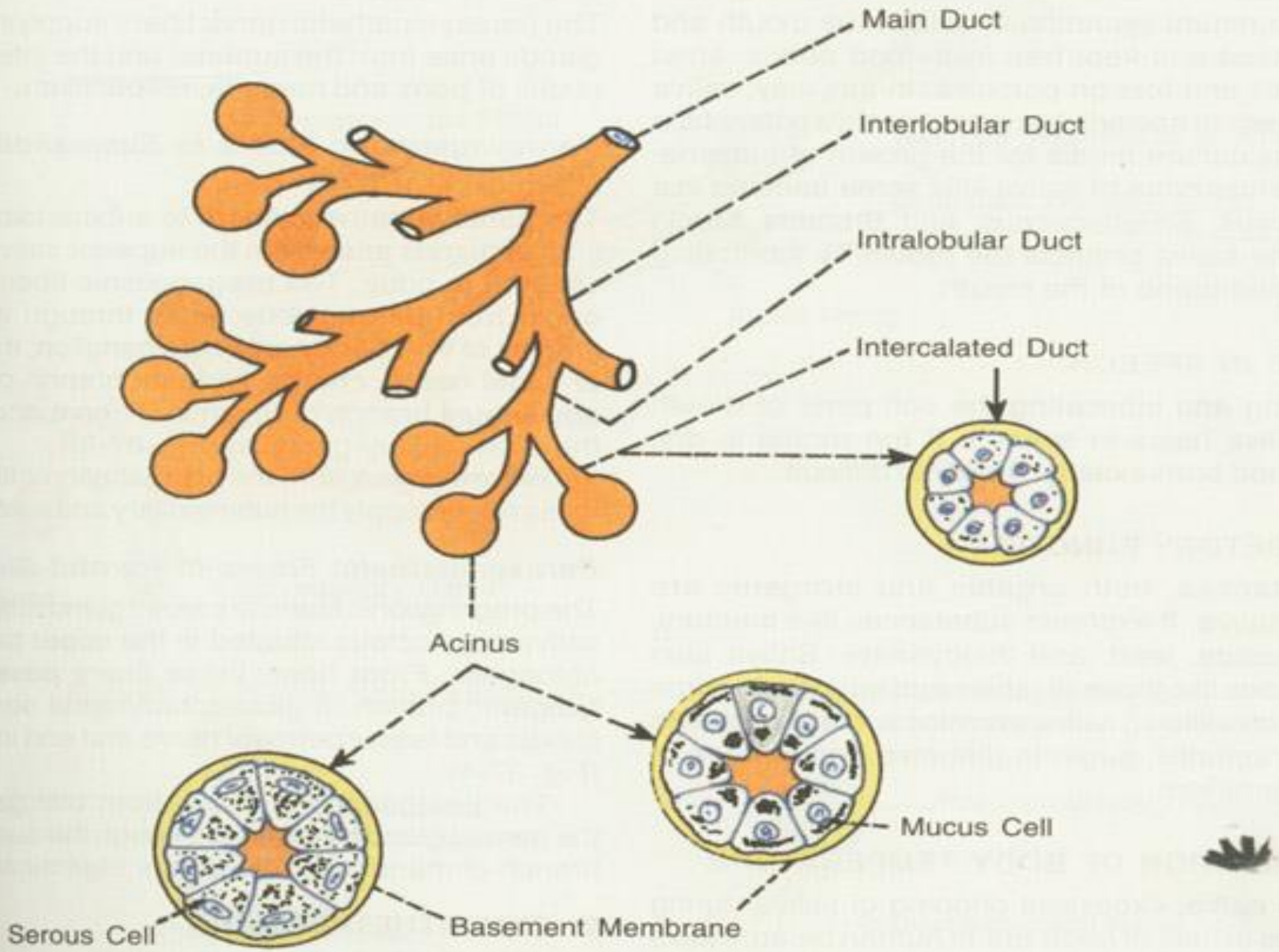


Diagram showing acini and racemose type of duct system in salivary glands

ACINAR CELLS

- CLUSTERED AROUND A CENTRAL LUMEN. ACINI COMPRISE THE TERMINAL OR SECRETORY END PIECE OF THE GLAND , SITUATED FARTHEST FROM ORAL CAVITY.
- POLYGONAL CELLS ON BASEMENT MEMBRANE CENTERED AROUND A CENTRAL DUCTAL LUMEN.

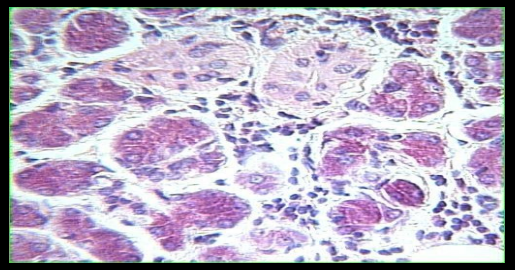
CONT..

- ACINAR CELLS OF SUBMANDIBULAR &SUBLINGUAL CONTAINS MUCOUS CELLS . THEY CONTAIN LARGE SECRETORY VACUOLES AND AREAS OF SMOOTH PARALLEL CISTERNAE. OTERWISE SIMILAR TO SEROUS CELLS.

CONT..

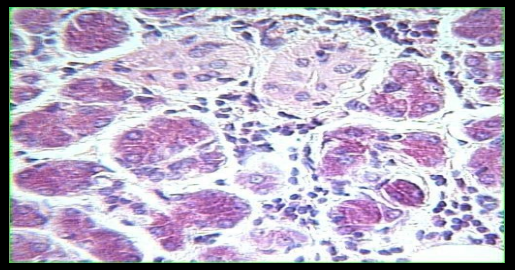
- SEROUS CELLS COMPRISE THE MAJORITY OF THE ACINAR CELLS OF THE PAROTID & GLANDS OF VON EBNER. ALSO SEEN IN ANTERIOR LINGUAL, SUBMANDIBULAR GLANDS.

SEROUS CELLS

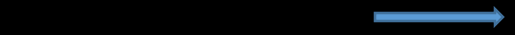


- SPECIALIZED FOR SYNTHESIS, STORAGE & SECRETION OF PROTEINS.
- PYRAMIDAL IN SHAPE
- BROAD BASE RESTING ON A THIN LAMINA WITH ITS NARROW APEX BODERING LUMEN.

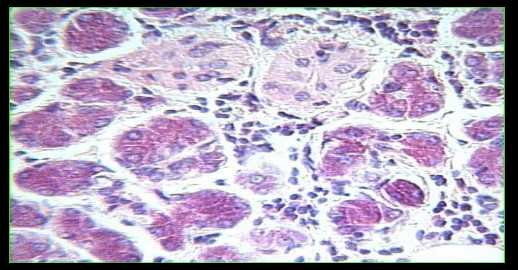
SEROUS CELLS



- SPHERICAL **NUCLEUS,** LOCATED IN THE BASAL REGION OF THE CELL, USUALLY BINUCLEATED.
- ACCUMULATION OF SECRETORY GRANULES IN THE APICAL CYTOPLASM PROMINENT FEATURE

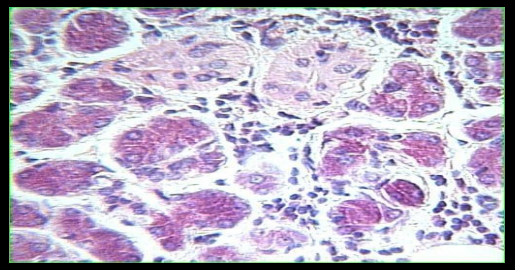


SEROUS CELLS



- GRANULES CLOSELY APPOSED TO ONE ANOTHER, THE PLASMA MEMBRANE, OR OTHER ORGANELLES
- BASAL PORTION OF THE CYTOPLASM FILLED WITH **RIBOSOME- STUDDED (ROUGH) ER**, A CLOSED SYSTEM OF MEMBRANEOUS SACS OR CISTERNAE.

SEROUS CELLS



- **RIBOSOMES,** CONSISTING OF RNA & PROTEINS, ARE THE BASIC UNITS OF PROTEIN SYNTHESIS.

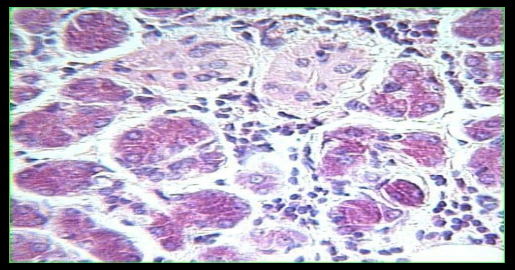
EXOCYTOSIS

- THE COMPLETED SECRETORY PROTEINS ARE STORED IN THE SECRETORY GRANULES IN THE CELL APEX.
- SECRETION & DISCHARGE OF THE GRANULE CONTENT OCCURS BY A PROCESS CALLED **EXOCYTOSIS**.

EXOCYTOSIS

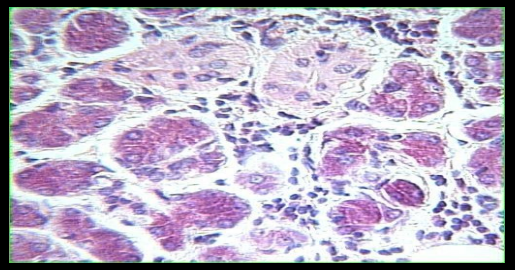
- EXOCYTOSIS INVOLVES FUSION OF GRANULE MEMBRANE WITH THE PLASMA MEMBRANE AT THE LUMEN OR INTRACELLULAR CANALICULUS,FOLLOWED BY THE OPENING OF THE FUSED PORTION.
- THE GRANULE MEMBRANE BECOMES CONTINOUS WITH THE PLASMA MEMBRANE & THE GRANULE CONTENT IS EXTERIORIZED WITHOUT LOSS OF CYTOPLASM.

SEROUS CELLS

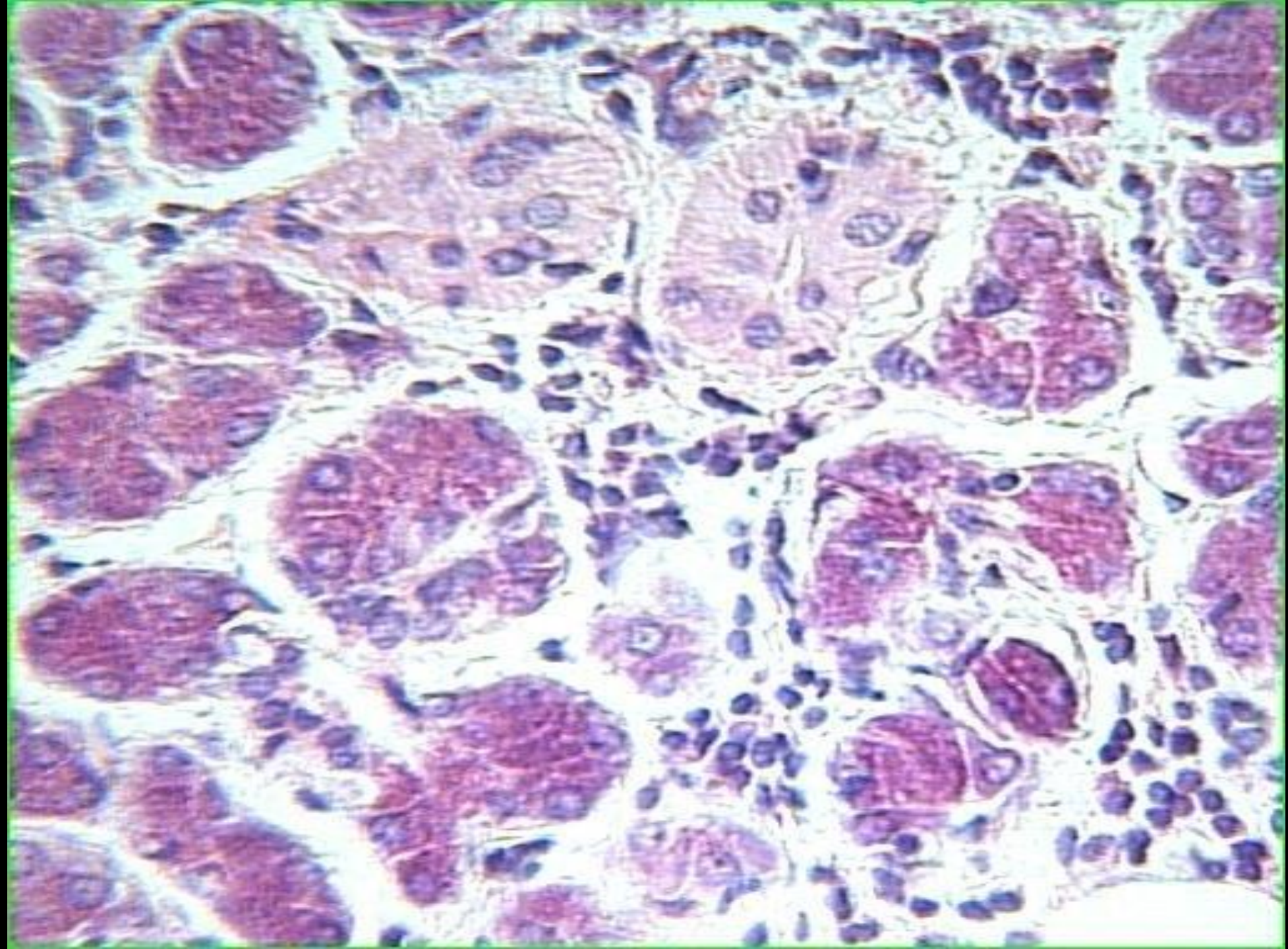


- **FREE OR UNATTACHED RIBOSOMES**---- SYNTHESIS OF NON SECRETORY CELLULAR PROTEINS.
- **MITOCHONDRIA**---CONTAIN THE ENZYMES OF CITRIC ACID CYCLE, ELECTRON TRANSPORT & OXIDATIVE PHOSPHORYLATION--- SOURCE OF HIGH ENERGY COMPOUNDS NECESSARY FOR NUMEROUS SYNTHETIC & TRANSPORT PROCESS THAT OCCUR IN THE CELL.

SEROUS CELLS



- **LYSOSOMES**----POTENT HYDROLYTIC ENZYMES---- TO DESTROY FOREIGN MATERIALS TAKEN UP BY THE CELLS, AS WELL AS CELLS THEMSELVES, SUCH AS WORN OUT MITOCHONDRIA OR OTHER ORGANELLS.



- WHERE SEROUS CELLS PREDOMINATE IN AN ACINUS, THEY ARE LARGE, POLYGONAL IN SHAPE.
- WHEN THE GLAND IS PREDOMINANTLY **MUCOUS,** THE SEROUS CELLS HAVE A CRESCENT (DEMILUNE) OR FLATTENED SHAPE. THEY HAVE A NUCLEUS TOWARDS BASEMENT MEMBRANE. ALSO CONTAIN ENDOPLASMIC RETICULUM . NUMEROUS GRANULES & VACUOLES IN THE LUMINAL REGION.

MUCOUS CELLS

DUCTS

- THE SECRETION PASS FROM THE ACINUS TO A SHORT INTERCALATED DUCT, LINED BY CUBOIDAL CELLS HAVING LARGE NUCLEUS & MANY MITOCHONDRIA BUT VERY FEW ENDOPLASMIC RETICULUM. THE CELLS HAVE SMALL CYTOPLASMIC VILLI EXTENDING IN LUMEN.

CONT..

- INTERCALATED DUCTS THEN PASS ABRUPTLY INTO ANOTHER SHORT, BUT WIDE, STRIATED DUCT. THEY ARE LINED BY COLUMNAR CELLS WITH MARKED CELLULAR MEMBRANE INTERDIGITATIONS PROJECTING TOWARDS THE LUMEN.

CONT..

- CYTOPLASM CONTAINS NUMEROUS LINEARLY ARRANGED MITOCHONDRIA PROVIDING THE STRIATED APPEARANCE.
- STRIATED DUCTS THEN PASS ABRUPTLY INTO TWO EPITHELIAL CELL LAYERED EXCRETORY DUCTS & FINALLY TO A STRATIFIED SQUAMOUS EPITHELIAL CELL LINED TERMINAL DUCT.

MYOEPITHELIAL CELLS

- THESE CELLS CONSTRICT THE ACINI & DUCTS TO FACILITATE SALIVARY SECRETORY FLOW.
- THESE STELLATE CELLS HAVE LONG THIN CYTOPLASMIC PROCESSES THAT INTERDIGITATE AROUND ACINI & DUCTS .
- THEY RESEMBLE SMOOTH MUSCLE CELLS

MECHANISM OF SALIVARY SECRETION

- **ACINAR FLUID FORMATION**: ACINAR FLUID COSISTS OF WATER, IONS, SMALL MOLECULES & SECRETORY PRODUCTS SYNTHESIZED BY THE CELLS. THE FLUID IS DERIVED FROM THE INTERSTITIAL FLUID, WHICH IN TURN IS DERIVED FROM THE BLOOD IN THE ADJACENT CAPPILLARIES.

CONT..

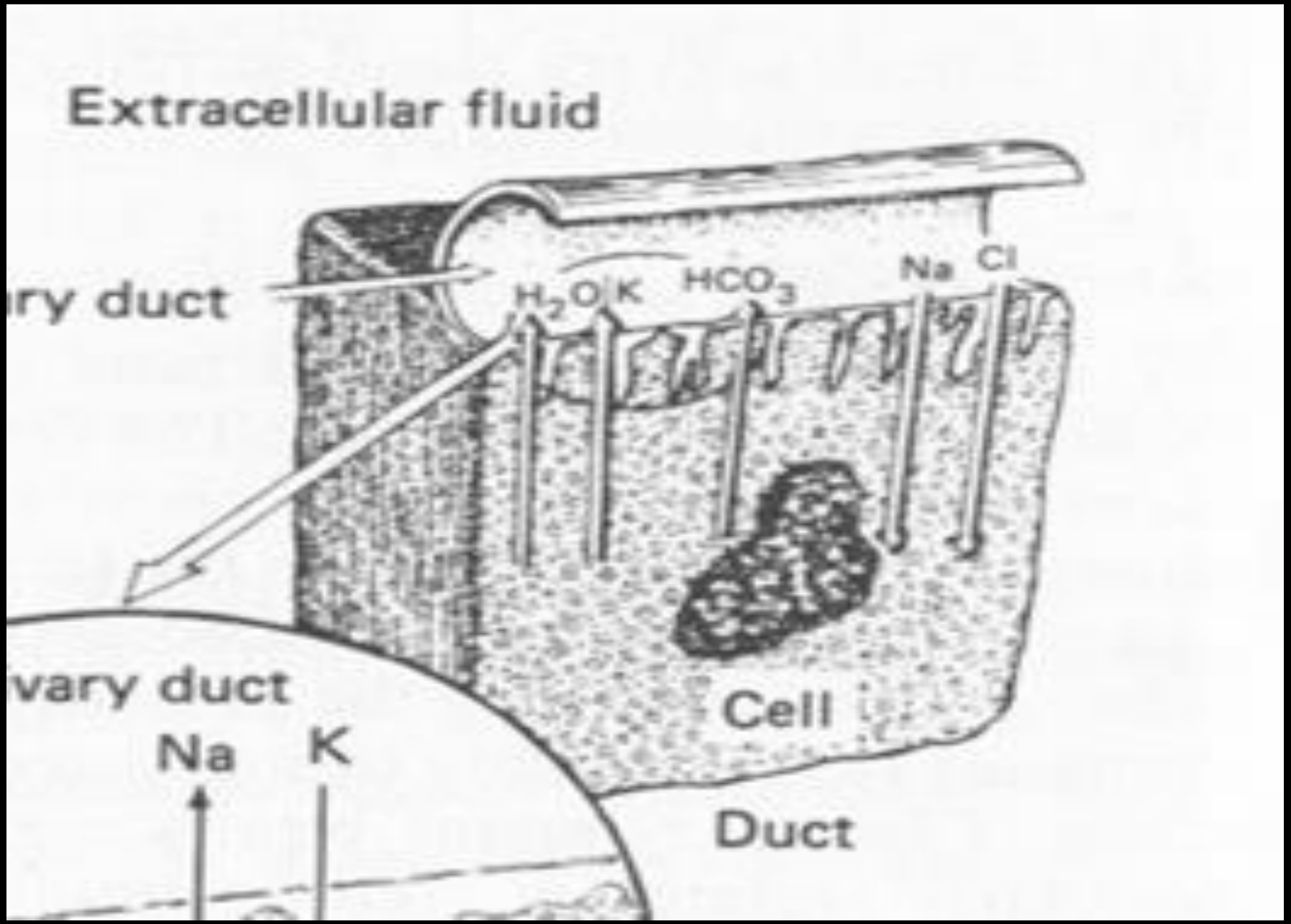
- AS SECRETION IS STIMULATED , THE BLOOD FLOW TO THE ACINAR REGION IS INCREASED, WITH THE PRESSURE GRADIENT TOWARDS THE ACINUS FACILITATING PRIMARY ACINAR FLUID FORMATION.

ROLE OF THE DUCTS

- ON PASSING THROUGH THE DUCTS , THE ACINAR FLUID IS TRANSFORMED FROM AN **ISOTONIC FLUID** WITH ANALOGOUS IONIC CONC TO PLASMA , TO A **HYPOTONIC FLUID** WITH LOW CHLORIDE & SODIUM ION CONC. THIS IS RESTICTED TO STRIATED DUCT, FACILITATED BY MARKED INTERDIGITATIONS OF LUMINAR CELLULAR WALLS.

CONT..

- THERE IS ACTIVE TRANSPORT OF SODIUM OUT OF THE FLUID WITH ACTIVE POTASSIUM TRANSPORT IN THE OPPOSITE DIRECTION, PASSIVE CHLORIDE DIFFUSION MAINTAINING AN ELECTROCHEMICAL BALANCE. BICARBONATE IS ALSO ACTIVELY SECRETED IN THE FLUID.


Extracellular fluid
ry duct
H_2O K
HCO_3
Na
Cl
Cell
vary duct
Na
K
Duct

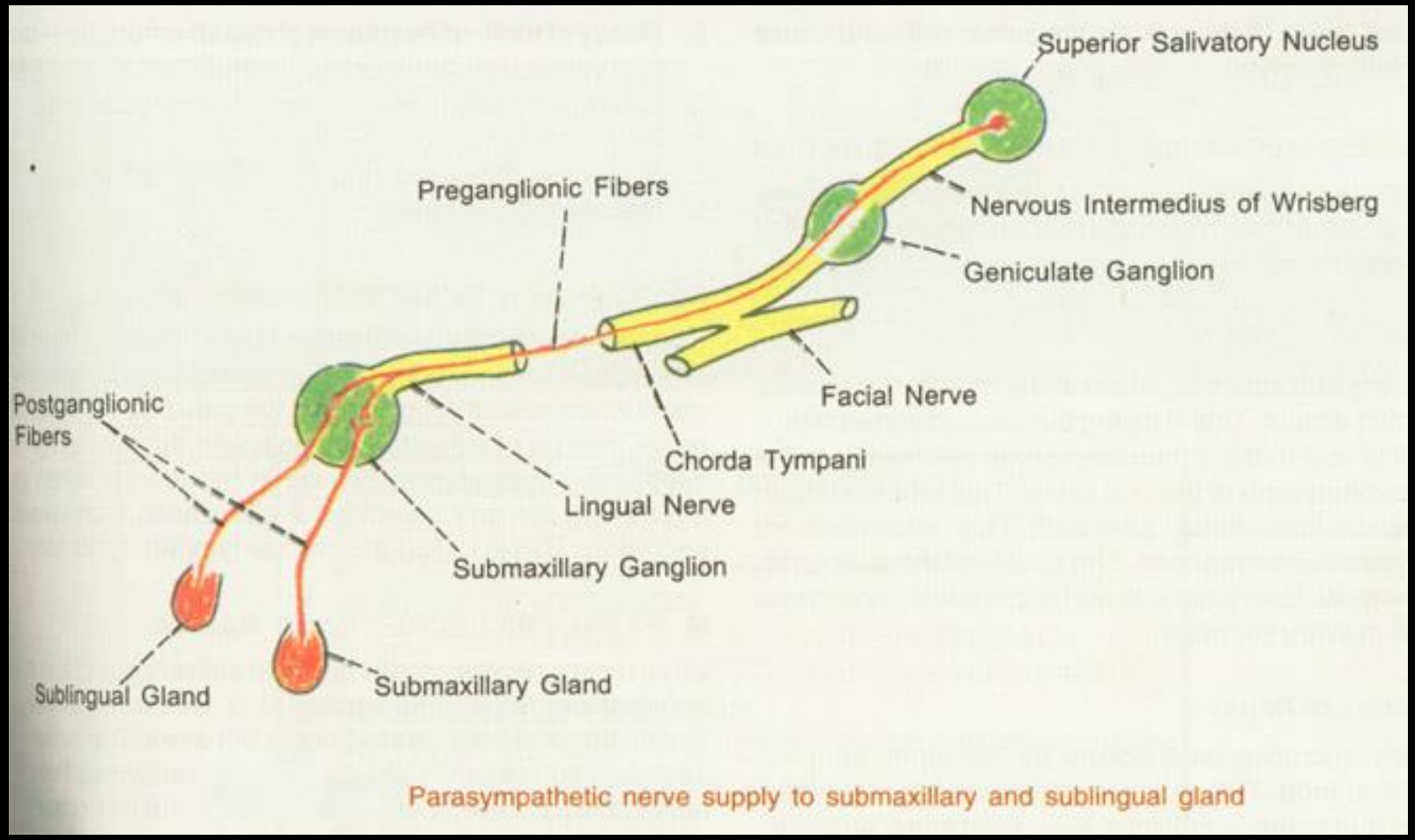
NERVE SUPPLY

- SALIVARY GLANDS ARE UNDER THE CONTROL OF AUTONOMIC NERVOUS SYSTEM & RECEIVE EFFERENT NERVE FIBERS FROM BOTH PARASYMPATHETIC & SYMPATHETIC DIVISIONS OF AUTONOMIC NERVOUS SYSTEM.

PARASYMPATHETIC FIBERS

- **ARISE FROM SUPERIOR & INFERIOR SALIVATORY NUCLEI OF PONS & MEDULLA.**

PARASYMPATHETIC NURVE SUPPLY TO SUBMANDIBULAR & SUBLINGUAL GLANDS



Parasympathetic nerve supply to submaxillary and sublingual gland

SYMPATHETIC FIBRES

- SYMPATHETIC FIBRES TO SALIVARY GLANDS ARISE FROM THE LATERAL HORNS OF FIRST & SECOND THORACIC SEGMENTS OF SPINAL CORD. THE FIBERS LEAVE THE CORD THROUGH THE ANTERIOR NERVE ROOT & END IN SUPERIOR CERVICAL SYMPATHETIC GANGLION.

FUNCTION OF NERVE FIBRE

- **PARASYMPATHETIC** : ACTIVATE THE ACINAR CELLS & DILATE THE BLOOD VESSELS OF SALIVARY GLANDS. WHEN PARASYMPATHETIC FIBERS ARE STIMULATED , PROFUSE & WATERY SALIVA IS SECRETED . THE ORGANIC COMPONENTS ARE LESS. NEUROTRANSMITTER IS ACETYLCHOLINE

REFLEX MECHANISM

- TWO TYPES : 1) UNCONDITIONAL REFLEX 2)CONDITIONAL REFLEX

UNCONDITIONAL REFLEX

- WHEN ANY SUBSTANCE IS PLACED IN THE MOUTH , THE SALIVARY SECRETION OCCURS. THIS IS DUE TO THE STIMULATION OF NERVE ENDINGS IN THE MUCUS MEMBRANE OF THE ORAL CAVITY. THS REFLEX IS INBORN & OCCURS IMMEDIATELY AFTER BIRTH.

CONDITIONAL REFLEX

- SALIVARY SECRETION ALSO OCCURS BY THE SIGHT, SMELL, OR THOUGHT OF FOOD.THIS IS DUE TO IMPULSES ARISING FROM EYES, NOSE ETC. THIS IS NOT INBORN REFLEX BUT IT IS AN ACQUIRED REFLEX.

SALIVA

- THE SALIVA CIRCULATING IN THE MOUTH AT ANY GIVEN TIME IS TERMED **WHOLE SALIVA**.
- IT COMPRISES A MIXTURE OF SECRETIONS FROM THE MAJOR & MINOR SALIVARY GLANDS.

CONT…

- SOME SALIVARY COMPONENTS IMMEDIATELY ATTACH TO TOOTH SURFACES, WHEREAS OTHERS INTERACT WITH ORAL SOFT TISSUES, BACTERIA & FOOD.

PROPERTIES OF SALIVA

- VOLUME: 1000 TO 1500 ml OF SALIVA IS SECRETED PER DAY & APPX ABOUT 1ml PER MIN.
- REACTION: MIXED SALIVA FROM ALL THE GLANDS IS SLIGHTLY ACIDIC WITH ph 6.35 TO 6.85
- SPECIFIC GRAVITY: 1.002 TO 1.012
- OSMOLALITY: SALIVA IS HYPOTONIC TO PLASMA

COMPOSITION OF SALIVA

- 99% - WATER
- 1% - LARGE ORGANIC MOLECULES LIKE PROTEINS, GLYCOPROTEINS & LIPIDS
- SMALL ORGANIC MOLECULES LIKE GLUCOSE, UREA.
- ELECTROLYTES LIKE Na, Ca, Cl2, PHOSPHATES.

PROTEINS

- MAJOR & PRIMARY CONTRIBUTION : ACINI.
- MINOR CONTRIBUTION : DUCTS & PLASMA CELLS.
- PAROTID : Avg 2.3 +/- 1.7 gm/lt
- SUBMANDIBULAR: 1.2 +/- 0.8 gm/lt
- SUBLINGULAL : 2.6 +/- 0.7 gm/lt

PROTEINS OF ACINAR ORIGIN

- AMYLASE
- LIPASE
- MUCIN
- PROLINE- RICH PROTEINS
- TYROSINE- RICH PROTEINS
- HISTIDINE- RICH PROTEINS
- CYSTEINE- RICH PROTEINS

CONT…

- PEROXIDASE
- LACTOFERRIN
- SECRETORY COMPONENTS
- GUSTIN
- PAROTID AGGREGINS
- EPIDERMAL GROWTH FACTOR

PROTEINS OF DUCTAL ORIGIN

- LYSOZYME
- SECRETORY IgA
- KALLIKREIN
- FIBRONECTIN
- VITAMIN- BINDING PROTEIN
- NERVE GROWTH FACTOR
- RIBONUCLEASES

CONT…

- CARBOHYDRASES
- ESTERASES
- PHOSPHATASE

PROTEINS ANALOGOUS TO THOSE FOUND IN BLOOD

- FACTOR VII (PROACTIVATOR)
- FACTOR IX (CHIRSTMAS FACTOR)
- FACTOR VIII (ANTI HEMOPHILIC FACTOR)
- PLATELET FACTOR

SERUM PROTEINS

- α - β GLOBULIN
- ALBUMIN
- Ig G, Ig m , Ig A

ELECTROLYTES

- SODIUM
- POTASSIUM
- CALCIUM
- PHOSPHOROUS
- CHLORIDE
- THIOCYNATE
- FLUORIDE
- BICARBONATES

SECRETORY IgA

- PREVENTS BACTERIA COLONIZATION BY AGGLUTINATION.
- BINDS TO SPECIFIC BACTERIAL ANTIGENS INVOLVED IN ADHERENCE.
- AFFECTS SPECIFIC ENZYMES ESSENTIAL FOR BACTERIAL METABOLISM

AMYLASE

- 30% OF THE PROTEIN FOUND IN SALIVA IS α-AMYLASE (PTYALINE) IS CALCIUM DEPENDENT & IS ACTIVATED BY CHLORIDE IONS. THIS ENZYME HYDROLYSES COOKED STRACH TO MALTOSE.

LYSOZYME

- PRESENT IN ALL MAJOR BODY FLUIDS BUT OCCURS AT HIGH CONC IN SALIVA, IN ADDITION TO LACRIMAL FLUID & NASAL & BRONCHIAL SECRETION.
- LYSOZYME ACTS ON THE B(1-4) BOND BETWEEN N- ACETYL-MURAMIC ACID & N-ACETYL-GLUCOSAMINE IN THE GRAM- POSITIVE BACTERIAL CELL WALL COMPONENT PEPTIDOGLYCAN LEADING TO ITS SUBSEQUENT DISRUPTION &MICROBIAL DEATH.

ACID PHOSPHATASE,CHOLINESTERASE, RIBONUCLEASE.

- THESE ENZYMES ARE PRESENT IN SIMILAR CONC IN PAROTID & SUBMANDIBULAR SALIVA , WITH PHOSPHATASE HAVING AN OPTIMUM Ph of 4.0

LIPASE

- A SPECIFIC LIPASE OCCURS IN PAROTID SALIVA.

PEROXIDASE

- IT IS AN ANTIBACTERIAL , OCCURS IN PAROTID SALIVA . IT INHIBITS GROWTH & ACID PRODUCTION OF A VARIETY OF MICRO-ORGANISMS, INCLUDING STREPTOCOCCI, LACTOBACILLI, FUNGI & ENTERIC BACTERIA.

KALLIKREIN

- IT SPLITS SERUM β GLOBULIN IN BRADYKININ, WHICH THEN PASSES BACK INTO THE GLAND & INTO THE BLOOD VESSELS. KALLIKREIN MAY THEREFORE CAUSE FUNCTIONAL VASODILATION TO SUPPLY AN ACTIVELY SECRETING GLAND.

MISCELLANEOUS ENZYMES

- PROTEASES
- AMINO-PEPTIDASES
- CARBOXYPEPTIDASES
- LIPASES
- UREASE
- GLUCURONIDASE
- HYALURONIDASE
- NEURAMINIDASE
- ESTERASES
- PHOSPHATASES
- SULPHATASE

MISCELLANEOUS ENZYMES CONTD…

- ACID & ALKALINE RIBONUCLEASES
- GLYCOLYTIC PATHWAY ENZYMES:
- SUCCINIC DEHYDROGENASE
- MALATE DEHYDROGENASE
- LACTATE DEHYDROGENASE
- GLUTAMATE DEHYDROGENASE
- β-HYDROXYBUTYRATE DEHYDROGENASE

MUCOPROTEINS AND GLYCOPROTEINS

- THE MAJORITY OF SALIVARY PROTEINS CONTAIN A LARGE PROPORTION OF CARBOHYDRATE IN THEIR MOLECULES,INCLUDING GALACTOSE, MANNOSE, HEXOSAMINE AND FUCOSE. PROLINE,GLYCINE AND GLUTAMIC ACID COMPRISE THE MAJOR AMINO ACID COMPONENTS.

CONTD…

- THESE NEGATIVELY CHARGED PROTEINS PROBABLY INTERACT WITH THE POSITIVELY CHARGED CALCIUM ON HYDROXYAPATITE SURFACES. THEY ALSO PROBABLY CONTRIBUTE TO THE ENAMEL PELLICLE, ENAMEL REMINERALIZATION AND PREVENTING TOOTH SURFACE BACTERIAL COLONIZATION.

BLOOD GROUP SUBSTANCES

- A,B,AB,OR THE GLYCOPROTEIN H SUBSTANCE , OTHER BLOOD GROUP ANTIGENS EX. THE LEWIS ANTIGEN FAMILY HAVE BEEN DESCRIBED IN SALIVA.

HORMONES

- TWO HORMONE LIKE SUBSTANCES ARE PRESENT : PAROTIN, WHICH FACILITATES CALCIFICATION AND HELPS TO MAINTAIN SERUM CALCIUM LEVELS, AND A NERVE GROWTH FACTOR THAT AFFECTS GROWTH AND DEVELOPMENT OF SYMPATHETIC NERVE FIBRES.

CARBOHYDRATES

- IN ADDITION TO CARBOHYDRATES BOUND TO PROTEINS, PAROTID SALIVA ALSO CONTAINS GLUCOSE AT A SIMILAR CONCENTRATION TO BLOOD. IN ADDITION TO GLUCOSE, SUBMANDIBULAR SALIVA ALSO CONTAINS HEXOSE AND FUCOSE WITH SMALL AMOUNTS OF HEXOSEAMINE AND SIALIC ACID.

LIPIDS

- DIGLYCERIDES, TRIGLYCERIDES, CHOLESTROL , CHOLESTROL ESTERS, PHOSPHOLIPIDS , IN ADIITION TO CORTICOSTEROIDS (MAINLY CORTESONE).THESE LIPIDS MAY PLAY A ROLE IN SALIVARY PROTEIN BINDING, BACTERIAL ADSORPTION TO APETITE AND PLAQUE MICROBIAL AGGREGATION

LACTOFERRIN

- LACTOFERRIN FUNCTIONS WITH OTHER ANTIMICROBIAL AGENTS, EXAMPLE, LYSOZYME AND LACTOPEROXIDASE TO MONITOR THE ORAL MICROBIAL FLORA.

INORGANIC SUBSTANCES

- SODIUM, POTASSIUM, CHLORIDE, BICARBONATE , HYDROGEN ION, IODINE FLOURIDE, THIOCYNATE, CALCIUM , PHOSPHATE.

FACTORS AFFECTING SALIVARY FLOWRATE

DIURINAL VARIATION…

PROTEIN CONCENTRATIONS HIGH IN THE AFTERNOON

SODIUM AND CHLORIDE CONC. ARE HIGH IN THE EARLY MORNING.

POTASSIUM HIGH IN THE EARLY AFTERNOON.

CALCIUM CONC. INCREASES AT NIGHT

CONTD…

- DURATION OF STIMULUS:
- IF SALIVARY GLANDS ARE STIMULATED LONGER THAN 3 MINUTES CONC. OF MANY COMPONENTS REDUCES . AFTER SHORT PERIOD BICARBONATE, CALCIUM AND PROTEIN CONC. BEGIN TO RISE AGAIN. MAGNESIUM PHOSPHATE AND POTASSIUM CONC. REMAINS STABLE AFTER INITIAL FALL.CHLORIDE CONC. FALLS . SODIUM AND IODIDE CONC. ARE UNAFFECTED BY THE DURATION OF THE STIMULATION AFTER THE FIRST FEW MINUTES.

CONTD…

- NATURE OF STIMULUS
- DIETERY FACTORS
- PLASMA CONC.
- HORMONAL INFLUENCES – ALDOSTERONE RESULTS IN INCREASED SODIUM REABSORPTION IN THE STRIATED DUCTS.

  ANTIDIURETIC HORMONE- IT FACILITATES WATER REABSORPTION BY STRIATED DUCT CELLS.

THANK YOU