CAN THIS BE READ?

CYTOLOGY – CELL BIOLOGY

CYTOS OLOGY

HISTOLOGY

HISTOS OLOGY

= WOVEN FABRIC.

~~HISTOL~~

HISTO PATH OLOGY

BASIC TISSUE TYPES

1. EPITHELIAL TISSUE
2. CONNECTIVE "
3. NERVOUS "
4. MUSCLE "
5. ADIPOSE - 'FAT' - LIPIDS

- ORGANS → O.SYSTEMS

MICROMETER - μm — 10^{-6} M

MILLI " MM 10^{-3} M

NANO " nM 10^{-9} M

5-20 μm

7 μm - RBC

CYTOLOGY

EUKARYOTIC CELLS — NUCLEUS —

PROKARYOTIC "

CYTOPLASM
- ORGANELLES

PLASMA MEMBRANE

GLYCOCALYX
SWEET COAT

FREEZE - FRACTURE
METHOD.

CYTOPLASM

- ORGANELLES
- CYTOSOL - CYTOPLASMIC MATRIX ('WATERY BIT')

CYTOSKELETON

① MICROTUBULES
- TUBULIN - 60K MW
- 24nM

② MICROFILAMENTS
ACTIN - 6nM
MYOSIN - 15nM

③ INTERMEDIATE FILS
7-10 nM diam

- CENTRIOLE
  - BASAL BODY → CICIA
  - PERI-CENTRIOLAR MATERIAL.
  - MASTER ORGANIZER

- RIBOSOME(S)
  - PROTEIN
  - rRNA
- rER –
  - POLY(RIBO)SOMES - mRNA

ENDOMEMBRANE SYSTEM

- NUCLEAR ENVELOPE
- GOLGI APPARATUS
- ENDOPLASMIC RETICULUM

- TUBULAR COMPONENTS
- CISTERNAE (SHEETS)
  - IRREGULAR -
  - REGULAR -

ROUGH ER (rER)
- GLYCOSYLATION

SMOOTH ER (sER)
- SYNTH. STEROIDS.
- DRUG DETOX.

- GOLGI APPARATUS
  - PACKAGE PROTEIN FOR SECRETION (FROM CELL)
  - SULPHATION -
  - PROCESSING FACTORY FOR MEMBRANES
- LYSOSOMES
  - INTRACELLULAR DIGESTION.
- TRANS GOLGI NETWORK.

INTRACELLULAR DIGESTION

↳ LYSOSOMES
TRANS GOLGI NETWORK

ENZYMES ~ PH 4
ACID ~~ACTIVABLE~~ PHOSPHATASE

HETEROPHAGY

RESIDUAL BODY

AUTOPHAGY

PEROXISOMES - CATALASE

H_2O_2

- COATED VESICLES
→ RECEPTORS
- RECEPTOR MEDIATED
ENDOCYTOSIS

CHOLESTEROL

MITOCHONDRION
(pl --- IA)

OUTER M. MEM - ~~CITRIC ACID~~

INNER M MEM - CRISTAE - ELECTRON TRANSFER

M. MATRIX - CITRIC ACID CYCLE

ATP

NUCLEUS

- NUCLEAR ENVELOPE
- NUCLEOPLASM
- NUCLEOLUS
- CHROMATIN

PERINUCLEAR SPACE 15nm

N. PORES - 70 nm

N. PORE COMPLEX (ANNULUS)

- NUCLEOPLASM

- NUCLEOLUS
  - rRNA RIBOSOMAL.
  - [redacted]A PROTEIN.

CHROMATIN — DNA

HETEROCHROMATIN - DARK - INACTIVE

EUCHROMATIN - PALE - ACTIVE DNA

NUCLEOSOME - 10X

SOLENOID - 30X

CHROMOSOME - 10,000 X

EPITHELIAL TISSUE
(THE EPITHELIUM OF __)

MESOTHELIUM - CLOSED INTERNAL
ENDOTHELIUM - BL. U.

(1) CELLULARITY.

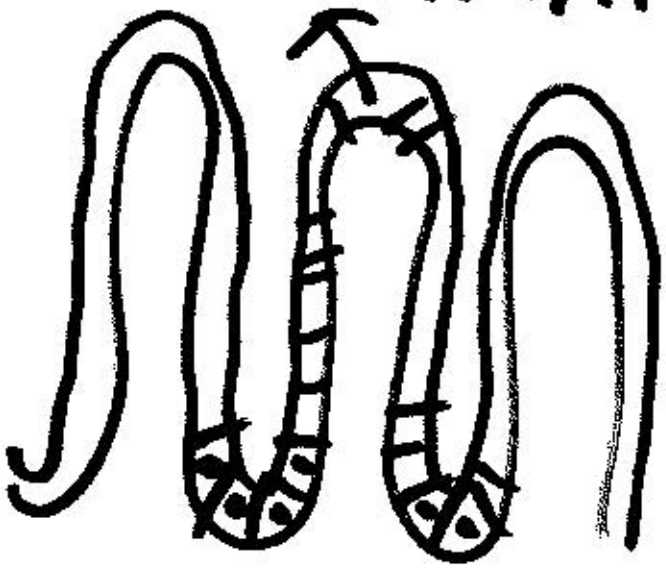
(2) POLARITY - APICAL
- LATERAL
- BASAL

(3) SPECIALIZED CONTACTS
- JUNCTIONS
  - PLASMA MEMB.
  - TIGHT J
  - DESMOSOMES

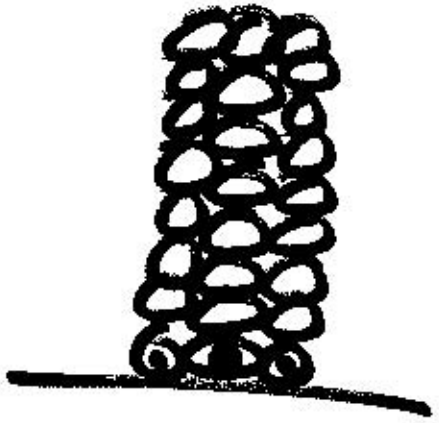
(4) LATERAL COMMUNICATION
GAP J.

(5) BASAL LAMINA
- LIMITS CONTACT
- 'DEFINES SPACE'

(6) CELL REPLACEMENT
- HIGH RATE OF



1-CELL THICK



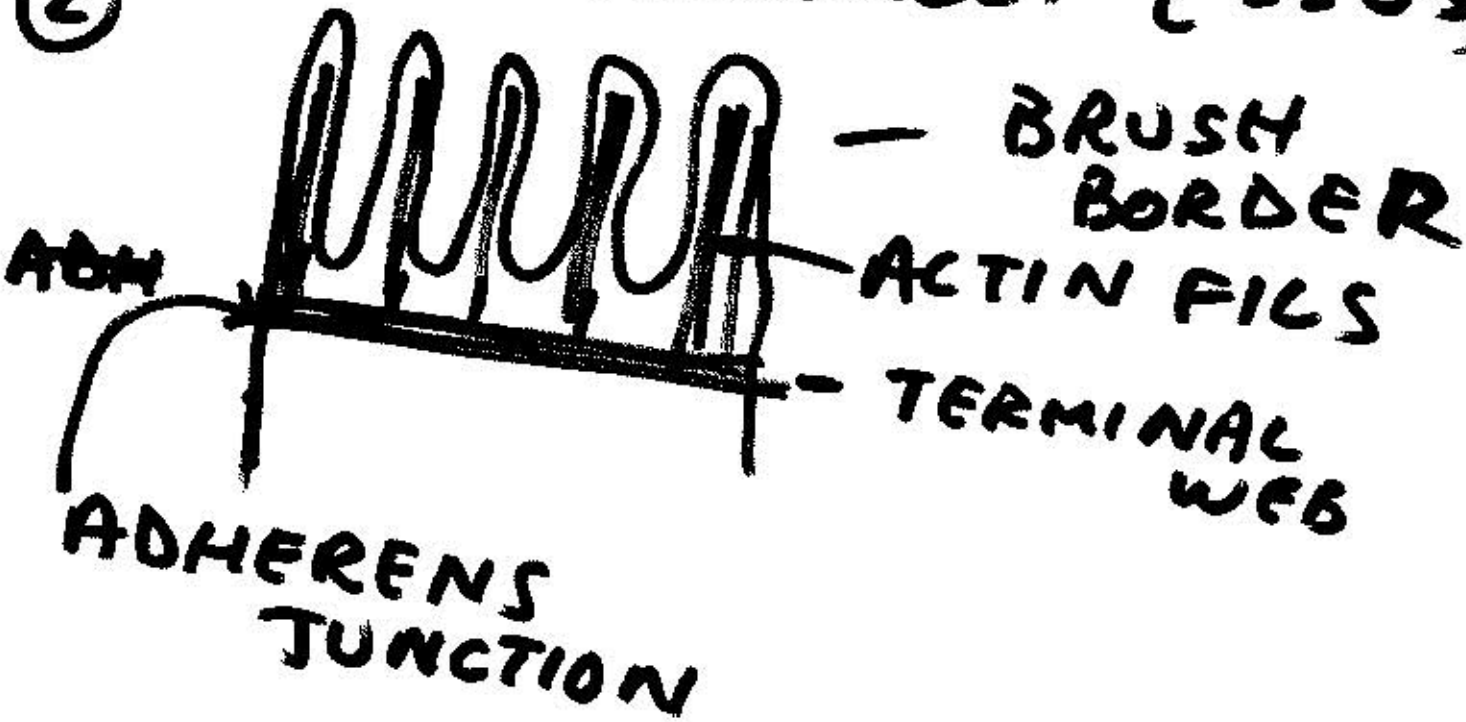
MANY THICK

— ALL HAVE SOME - NOT ALL HAVE ALL

① PROTEIN COMPLEMENT
- GLYCOPROTEINS
- EG. ALKALINE PHOSPHATASE
- GLYCOCALYX (SWEET COAT)
- SIALIC ACID → -VE

INTEGRAL

② -MICROVILLI (--US)



③ STEREOCILIA (LONG MU)

~10 μm

- SENSORY RECEPTORS

CILIA & FLAGELLA
(CILIUM) (-- UM)

BASAL BODY - AXONEME
9 OF 3 MTs 9+2
MTs

DYNEIN - 'ATPASE'

BEAT - 'MOTILE'

LATERAL ('SIDE') PM

JUNCTIONS
JUNCTIONAL COMPLEX.

1 TIGHT J
2 ADHERENS J
3 DESMOSOME
4 GAP JUNCTION

TIGHT J. - OCCLUDIN
('TIGHT' TJ
'LEAKY' ..

ADHERENS J
- CADHERINS.

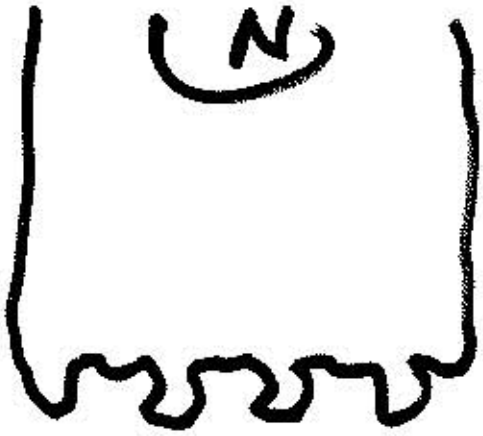
DESMOSOME
(SPOT)
- DESMOCOLLINS
'SPOT WELDS'

(4) GAP J. (NEXUS)
CONNEXONS - CONNEXIN

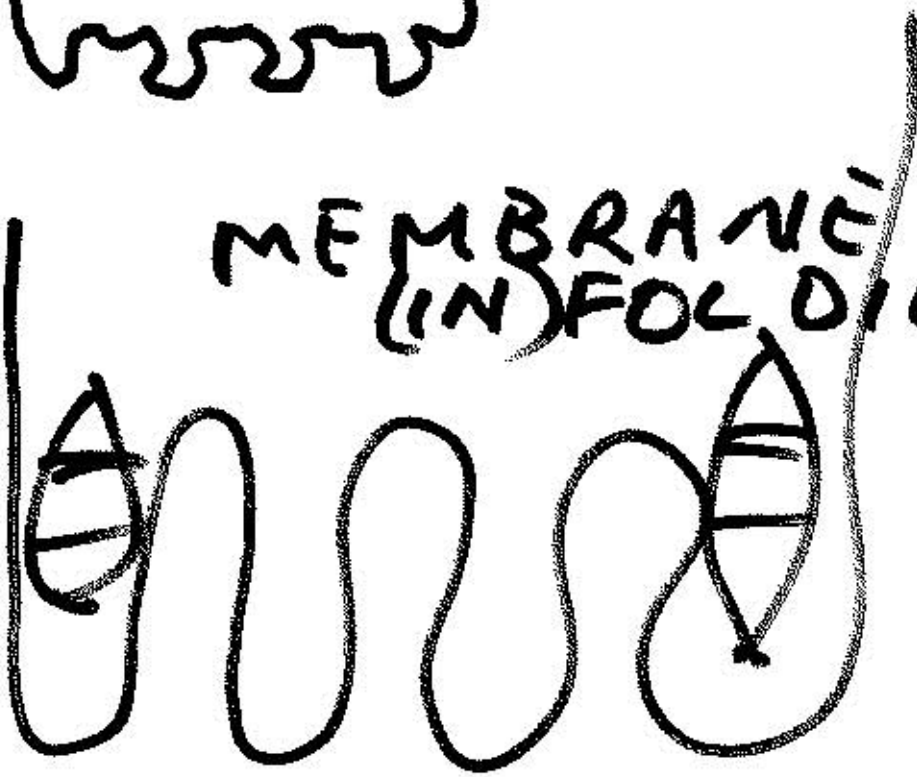
BASAL (AM)

(1) HEMI DESMOSOME (EPIDERMOLYSIS BULLOSA)

(2) PEDICLES ('LITTLE FEET')



(3) MEMBRANE (IN)FOLDING

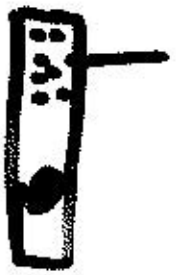


TYPES/FUNCTIONS OF EPITHELIA

THE BARRIER FUNCTION
- SEPARATION OF ENVTS

PLUS —

- SIMPLE SQUAMOUS
  - " CUBOIDAL
  - " COLUMNAR
    - SECRETORY
    - ABSORPTIVE



MIXED

- MV - TYPICAL - 'COMMON'

- GOBLET - MUCUS

- CILIATED CELLS.
- + 'SO OTHERS'

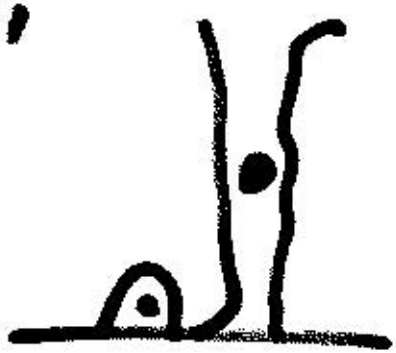
- STRATIFIED SQUAMOUS.
'WEAR & TEAR'
- KERATINIZATION
- S-S-
- SQUAMES
'HORNY'

NON-K ST. SQ. EPITH.

STRAT. CUB + COLUMN.

PSEUDOSTRATIFIED

↳ = 'FALSE'



TRANSITIONAL EPITH

↳ TRANSITORY = CHANGES.

REFRACTILE BORDER