

DEAD
Epidermis
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- layers of flat cornified cells = corneocytes surrounded by lipid layers
- prevent water loss and entry of foreign material
- natural sunscreen (urocanic acid)

- forms a cornified envelope from protein precursors crosslinked w/ large insoluble proteins which is surrounded by lipid envelope = cornium conyatum

- cell and intercellular elements desquamated = cornium disjunction

- so slow no scales visible

- 13um

- more calcium

Stratum corneum

NOT always present: prominent in v. thick epidermal regions

Stratum Lucidum

keratohyalin granules not present

- flat squamous cells
- most superficial living layer
- contain keratohyalin = aggregates of profilaggrin, keratin filaments, loricin

- At corneal surface, fused membranes of dead organelles lysosomal contents are secreted as lamellar (rod) bodies, that fuse to form lipid layers

- synthesize and hold "interfibrillary matrix" together

Stratum Granulosum

- thick in regions w/out hair
- thin in hairy layers
- produce glycoproteins and lipids

- polygonal to squamous

- appear spinous b/c of cytokeratin filaments at desmosomal junctions

- gap junctions = pores for communication

Stratum Spinosum

- cuboidal or polygonal
- rests on basement membrane
- most immature epidermal layer
- deepest layer of epidermis

Stratum Basale (germinativum)

- less calcium

- contacts epidermis
- conforms to contour of Stratum basale forming dermal papillae
- interdigitate w/epidermal projections into dermis called epidermal pegs

most superficial dermal layer

Papillary Layer

- contain fibroblasts, macrophages, plasma cells, mast cells fat
- dermal ridges = fingerprints

Dermis

- deeper layers
- abundant and large bundles of collagenous fiber

Reticular layer

Hypodermis

- large deposits of fat
- absorptive cushions/pads

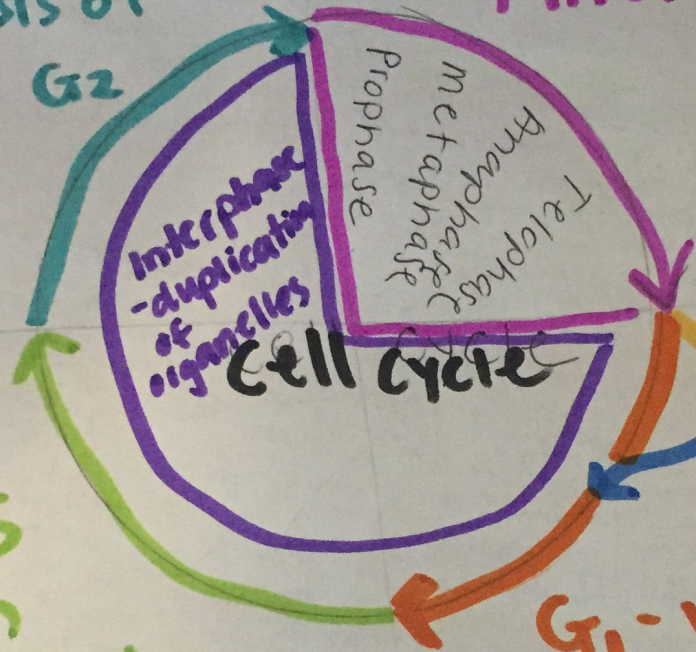
Panniculus adiposus

- cutaneous muscle for voluntary movement of skin

Panniculus carnosus

Post duplication stage; synthesis of nuclear histones G₂ & RNA

Synthetic Stage when DNA is duplicated



Mitosis

Prophase

Metaphase

Anaphase

Telophase

Chromatin condenses, coils, then supercoils to become chromosome
nuclear envelop begins to disappear

nuclear envelop gone, spindle form: form metaphase plate
microtubules attach to kinetochores

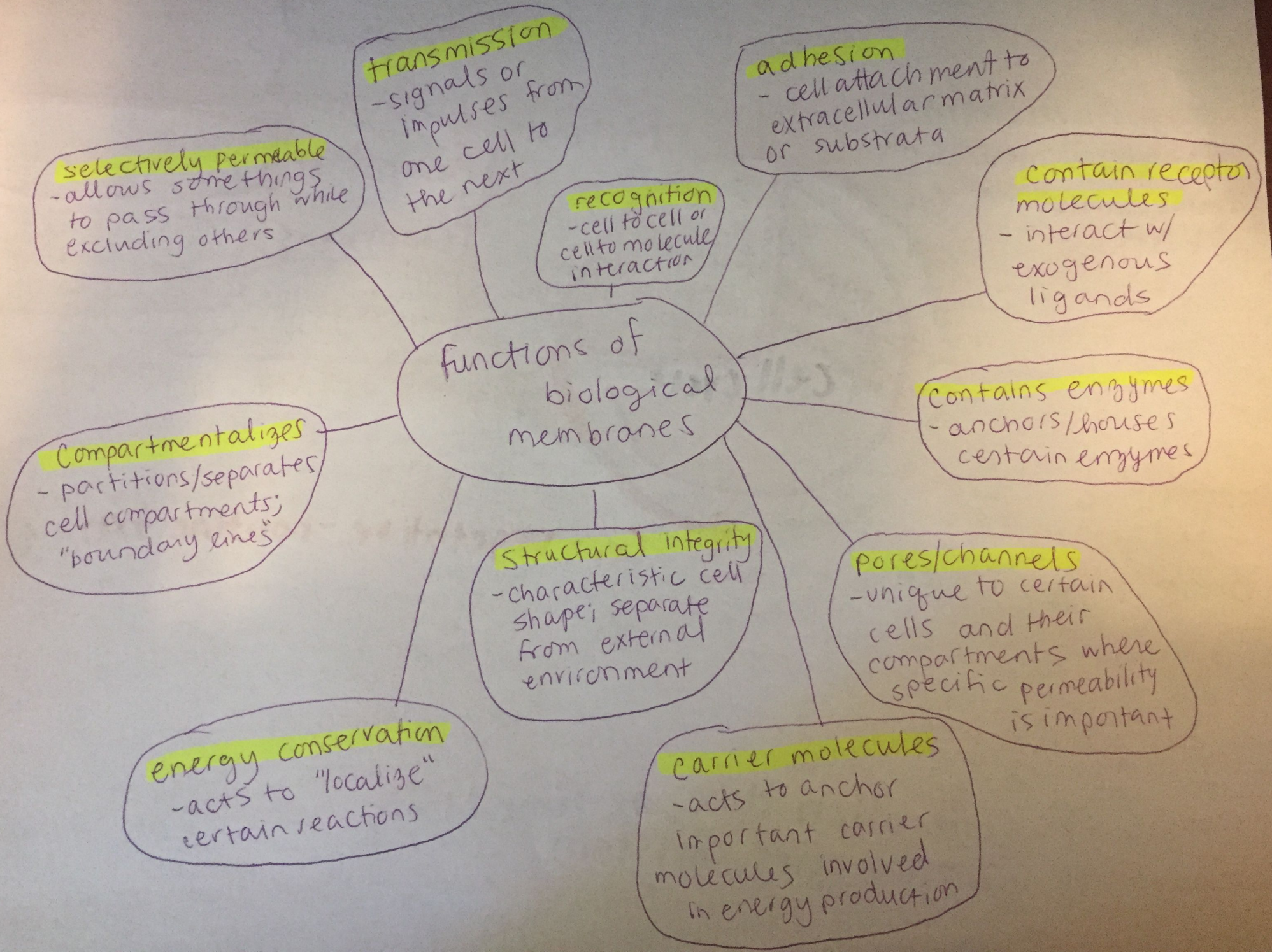
kinetochore splits: each daughter chromosome migrates to opposite poles
karyokinesis complete

chromatin uncoils, nuclear envelop reforms
cytokinesis aided by actin forming ring, results in cleavage furrow

G₀ - "R" phase - arrested

G₁ - vegetative - routine fxn

T: generation time, or time btwn 2 successive divisions



Cell Feature	Structure	Function
Ribosomes Ribosomes	<ul style="list-style-type: none"> 60% RNA, 40% protein only visible by microscopy when active Free or attached 	<ul style="list-style-type: none"> translate mRNA into protein if protein is to be used w/in cell, free if protein is for export → attached
Rough Endoplasmic Reticulum Rough Endoplasmic Reticulum	<ul style="list-style-type: none"> Flattened bag or cisternae or lamellae ribosomes attached, nascent protein is inserted into RER 	<ul style="list-style-type: none"> provide an alternate space for protein production to prepare protein for export
Smooth Endoplasmic Reticulum Smooth endoplasmic Reticulum	<ul style="list-style-type: none"> tubular membranous cisternae - branching and anastomosing 	<ul style="list-style-type: none"> contains enzymes (e.g. glucose 6 phosphate) fatty acid conversion to fats synthesis of steroid hormones? lipoproteins
Peroxisome Peroxisome	<ul style="list-style-type: none"> on edge of SER smaller than lysosomes 	<ul style="list-style-type: none"> metabolism? detoxification regulates O₂ tension oxygen sink
Golgi Complex golgi complex	<ul style="list-style-type: none"> Flattened stacks → contain ordered enzymes - does not stain - polarized w/ regions of entry and exit 	<ul style="list-style-type: none"> condense/concentrate synthesized products membrane trafficking - renews old membrane? appropriately targets new
Lysosome Lysosome	<ul style="list-style-type: none"> small oval to spheroid structure - bigger than peroxisomes contain enzymes for protein turnover primary, secondary, residual 	<ul style="list-style-type: none"> recycling center of the cell; protein metabolism, destruction of ingested material

cell

<p>Mitochondrion Mitochondrion</p>	<p>tubular, spheroid, oval internal and external membranes w/ cristae (folds) internal contains own DNA in matrix Acetyl</p>	<p>convert energy released into ATP thru oxidation of carbs, lipid SO_4^{2-} AT to $\text{CO}_2 + \text{H}_2\text{O}$ Acetyl CoA produced in matrix</p>
<p>Microtubules microtubules</p>	<p>structural protein \rightarrow contribute to cytoskeleton "tiny tubes" - move organelles or hold in place</p>	<p>morphogenesis, maintenance of cell shape/polarity, control/ stabilize intracellular organelle traffic motility of specific structures</p>
<p>Centrioles centrioles</p>	<p>structural fused triplet of microtubules 2 in diploid cells, many in multinucleated 9 subunit arrays</p>	<p>center of microtubule assembly/movement -important in mitosis, genesis of cilia, mitochondria? new centrioles</p>
<p>Intermediate filaments Intermediate filaments</p>	<p>structural proteins -wide variety of protein subunits -contributes to cytoskeleton (stress protein) structural "keratins"</p>	<p>structural orientation of other structural elements, anchoring of structures to cell surface</p>
<p>Microfilaments microfilaments</p>	<p>contractile proteins -smaller in diameter actin + myosin to generate motile forces</p>	<p>cell locomotion muscle cell contraction cell surface ruffling and invagination</p>
<p>Nucleus</p>	<p>outer? inner membranes \rightarrow selectively permeable outer is continuous w/ ER nuclear pores allow interchange</p>	<p>hold euchromatin? heterochromatin -transcription</p>
<p>Nucleolus</p>	<p>distinct nuclear region circular</p>	<p>transcription, processing, and packaging of ribosomal RNA</p>