Interesting facts

Longest cells in humans are motor neurons 1.37 meters

Every square inch in human average 32 billion bacteria

Human shed 600,000 particles of skin every hour

Humans regrow outer skin cells about every 27 days

Largest cell is female egg

Smallest cell in male body is sperm

Three hundred cells die every minute

Evolution of cells, Cell theory, Structure

Evolution of Cells

4.5 billion years ago

0.5 billion years ago

Cell theory

All living things are made up of cells

cell is the functional unit of life

All living cells come from pre-existing cells

Cell structure

the cell is the basic unit of life and contains internal structures called organelles

Nucleus

Nucleus

Dark granule in the center of the cell

Stores genetic information

Controls cell activities through protein synthesis

Controls cell division

It is the site of DNA replication and transcription

Nucleolus

This is the dark stained area in the nucleus

Made up of RNA

It has no membrane

Makes rRNA (ribosomal RNA) which then makes ribosomes

Nuclear Membrane/Envelope

Double layer of cell membrane, which contains very large pores

Pores allow RNA and proteins in and out of the nucleus

Chromatin

Densly coiled DNA wrapped around histone proteins

Contains the blueprint for all proteins in the body

Condensed into chromosomes before cell replication

Nucleus (cont)

Nucleoplasm

Cytoplasm of the nucleus

Supports and suspends the contents of the nucleus

Mitochondria

Furnace of the cell

Has double membrane, inner membrane is very folded = CIRISIAE(Increased surface area)

Have their own DNA

Used to convert chemical energy in food into ATP

Performs Cellular respiration

Ribosome

Small dark granules made of rRNA

Site of protein synthesis

Make sure the correct order of amino acids in the protein chain

Sometimes attached to the rough er, so that proteins made can be easily exported

Polysome

Join up to make copies of the same protein

Produce proteins to only be used inside the cell

Types of Cells

Prokaryotic

Pro=before

Karyotic=nucleus

These were the first cells

Were primitive small had no defined nucleus (no nucleus membranes) and no membrane bound cell organells

They have ribosomes

Eukaryotic

eu=true

karyotic=nucleus

modern cells

Have nucleus and membrane bound organells

Much larger up to 1000 longer.

Organelles

Organelles

Plasma Membrane

Universal structure same in each organism

Composed of a bilayer of phospholipids proteins embedded in it

Organelles (cont)

Most organelles inside cell also have bilayer membrane

Model used to explain cell membrane is called fluid mosaic model

Selectively permeable control what comes in and out of cell

does not let large, charged, or polar things through

Fluid Mosaic Model:The phospholipidsmove thus allowing small non-polar molecules to slip through

Phospholipid Bilayer = Double layered membrane

Glycolipids:Carbs attached to phospholipids.act as receptors

Glycoprotiens:Carbs attached to proteins.Act as receptors.

Integral Proteins:assists specific larger and charged molecules to move in and out of cell.Can act as tunnels and change shape

Peripheral proteins:Only go through a part of the membrane or sit on top of another protein

Cholesterol:Reduces membrane fluidity reducing phospholipid movement.Stops membrane from becoming solid at room temperatures.

Cytoskeleton:Acts as framework gives cell shape.Serves as monorail to transport organelles around the cell.

Rough Smooth ER

Endoplasmic Reticulum

Network of sheets of cell membrane.

Er connects the nuclear membrane to the plasma membrane

Transport system

Two types of ER

Rough ER

Smooth ER

Rough ER

Attached ribosomes

Sometimes connected to nuclear membrane

Ribosomes make proteins put them in rER

Sometimes modified here

rER packages proteins in a vesicle and sends them to the Golgi Body

Smooth ER

Rough Smooth ER (cont)

No ribosomes

Makes lipids and steroids

Deotoxifies harmful material or waste products

Lots of sER in liver cells and glands that make hormones

GolgiApparatusVessVacuoleLysosomeCytoskeleton

Golgi Apparatus

Made up of flattened saccules of cell membranes which are stacked loosely on top of each other

One side faces the ER and other faces plasma membrane

Usually vesicles at the edges of the golgi

To receive modify and temporarily store proteins and fats from the rough and smooth ER

These proteins are packaged into vesicles which pinch ff from the edges, and are distributed within the cell or shipped to the cell membrane for excretion

Vessicles

Storage sacks of the cell membrane

Smaller and are formed by pinocytosis (Cell drinking) at the plasma membrane or are made by the golgi body

Used to move substances around the cell that need to be separate from the cytoplasm

Stores food water and/or waste.

Vacuole

Larger and formed by phagocytoes(Cell eating)

Lysosome

Double membraned vacuoles with hydrolytic (digestive) enzymes

Made by gogli body

Known as suicide sacs

Lysosome--Hydrolysis

Attach to food vacuoles and digest their contents

Destroy old or malfunctioning cell parts

Capable of destroying bacteria

Cytoskeleton

Gives cell its shape and form anchors and supports cell organelles

Serves as monorail to transport organelles around the cell

GolgiApparatusVessVacuoleLysosomeCytoskeleton (cont)
Two components of cytoskeleton microtubes microfilaments
Microtubule
Larger than microfilaments
Cylinder shaped and made of a coiled protein called tubulin
they are used to make cilia, flagella, centroiles and spindle fibers
Cilia & Flagella
Are hair like projections, which use energy to produce movement/locomotion
Move as the pairs of tubules slide against each other
Cilia are short and there are many of them.Flagella are long and few
Made up of microtubles
Anchored to cell by a basal body
Centriole
Pair of basal bodies(microtubules) that grow spindle fibers
They attach to and move chromosomes during mitosis
Found in animal cells only
Microfilaments
Long and extremely thin protein fibres that occur in bundles made of 2 proteins called actin and myosin
Organelles more around the cytoplasm with the help of these
Cytoplasm
Watery gell it supports all organelles to provide water for all of the cells biochemistry
Mainly water with dissolved salts, proteins and other organic compounds.