**TRANSCRIPT FROM YOUTUBE VIDEO**

**“OVERVIEW OF CELL STRUCTURE”**

Cells are the smallest living units of an organism.

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All cells have three things in common

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no matter what type of cell they are.

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All cells have a cell membrane which separates the inside the cell from its environment,

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cytoplasm, which is a jelly-like fluid,

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and DNA which is the cell's genetic material.

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There are two broad categories of cells.

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The first category is eukaryotic cells.

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They have organelles

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which include the nucleus and other special parts.

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Eukaryotic cells are more advanced complex cells

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such as those found in plants and animals.

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The second category is prokaryotic cells.

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They don't have a nucleus or membrane enclosed organelles.

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They do have genetic material but it's not contained within a nucleus.

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Prokaryotic cells are always one celled

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or unicellular organisms such as bacteria.

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So what are organelles?

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Organelle means "little organ."

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are the specialized parts of a cell that have unique jobs to perform.

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Let's start with the nucleus, the control center of the cell.

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The nucleus contains DNA or genetic material.

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DNA dictates what the cell is going to do

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and how it's going to do it.

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Chromatin the tangled, spread out form of DNA found inside the nuclear membrane.

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When a cell is ready to divide

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DNA condenses into structures known as chromosomes.

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The nucleus also contains a nucleolus,

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which is a structure where ribosomes are made.

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After ribosomes leave the nucleus

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they will have the important job of "synthesizing",

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or making, proteins.

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Outside the nucleus the ribosomes and the rest of the organelles

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float around in cytoplasm, which is the jelly-like substance.

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Ribosomes may wander freely within the cytoplasm

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or attach to the endoplasmic reticulum, sometimes abbreviated as ER.

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There are two types of ER:

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rough ER has ribosomes attached to it

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and smooth ER doesn't have ribosomes attached to it.

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The endoplasmic reticulum

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is a membrane enclosed passageway for transporting materials

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such as the proteins synthesized by ribosomes.

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Proteins and other materials

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emerge from the endoplasmic reticulum

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in small vesicles

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where the Golgi apparatus, sometimes called the Golgi body

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receives them.

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As proteins move through the Golgi body they're customized

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into forms that the cell can use.

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The Golgi body does this by folding the proteins into usable shapes.

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or adding other materials on to them

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such as lipids or carbohydrates

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Vacuoles are sac-like structures that store different materials.

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Here in this plant cell the central vacuole

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stores water.

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Going back to the animal cell you'll see an organelle called a lysosome.

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Lysosomes are the garbage collectors

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that take in damaged or worn out cell parts.

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They are filled with enzymes that break down this cellular debris.

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The mitochondrion in is an organelle that is the powerhouse for both

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animal and plant cells.

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During a process called cellular respiration

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the mitochondria make ATP molecules

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that provide the energy for all the cells activities.

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Cells that need more energy

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have more mitochondria.

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Meanwhile the cell maintains its shape

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through a cytoskeleton.

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The cytoskeleton includes the thread-like microfilaments

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which are made of protein

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and microtubules which are thin hollow tubes

5:04

Some organisms

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such as plans that are photoautotrophic

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meaning they capture sunlight for energy

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have cells with an organelle called a chloroplast.

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The chloroplast is where photosynthesis happens

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It's green because it has a green pigment called

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chlorophyll.

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Plant cells also have a cell wall outside of their cell membranes

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that shape, support,and protect the plant cell.

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Animal cells never have a cell wall

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There are many other unique structures that only some cells have.

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Here are just a few.

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In humans for example the respiratory tract is lined with cells that have cilia.

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These are microscopic hair-like projections

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that can move in waves.

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This feature helps trap inhaled particles in the air and expels them when you cough.

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Another unique feature in some cells is flagella.

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Some bacteria have flagella.

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A flagellum is like a little tail that can help a cell move or propel itself.

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The only human cell that has a flagellum

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is a sperm cell.

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In summary remember eukaryotic cells

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are plant and animal cells with a nucleus and membrane-enclosed organelles

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While prokaryotic cells

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are unicellular organisms without these things.

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All cells have a cell membrane

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cytoplasm and genetic material.

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And even though only plant cells have chloroplasts

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both plant and animal cells have mitochondria.