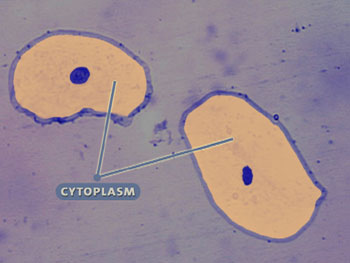
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**Cytoplasm**



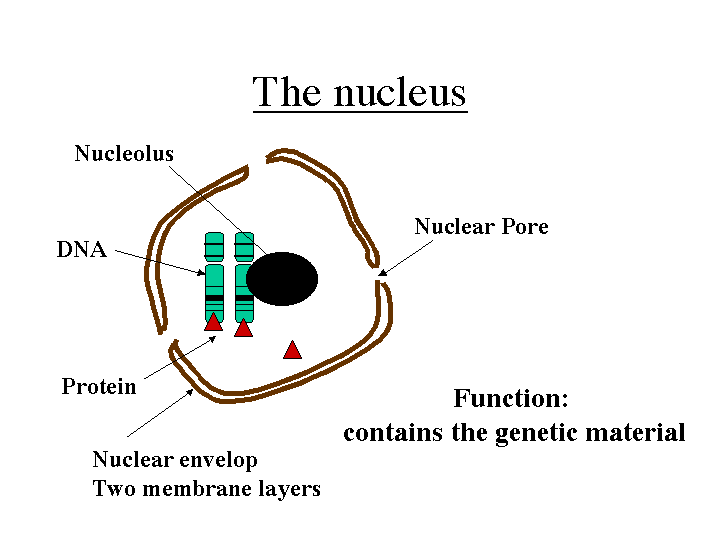
<http://www.learner.org/courses/essential/life/images/show1.cytoplasm.jpg>

* Functions:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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* What cells have cytoplasm?

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* Functions:
  + Gives the cell shape and structure.
  + Protects the organelles.
  + Helps with cellular movement (with pseudopods)
  + Thick enough to keep oragnelles generally in place but thin enough to allow subtances to move throughout the cell.
* What cells have cytoplasm?
  + All cells (both prokaryotic and eukaryotic)

**NUCLEUS**



<http://www.ucl.ac.uk/~sjjgsca/CellNucleus.gif>

* Functions of the nucleus:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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* Structure of the nucleus and nuclear membrane:

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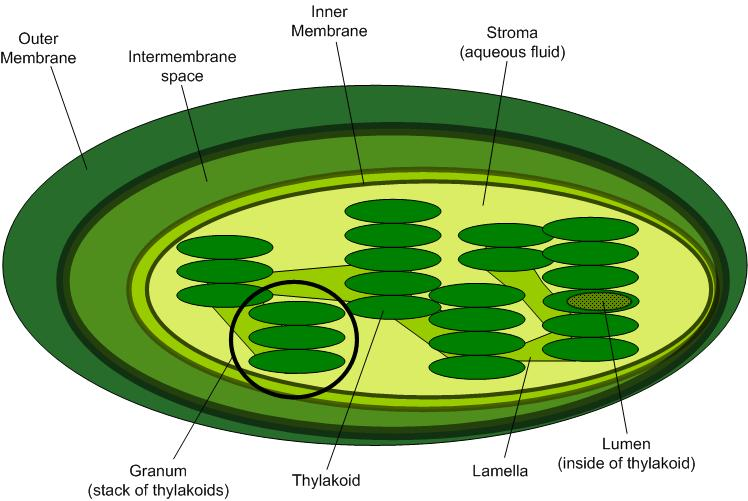
* What cells have a nucleus?

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* Functions of the nucleus:
  + Surrounds and holds the DNA of the cell.
  + “Control center” of “brain” of the cell.
  + Location where ribosomes are made.
* Structure of the nucleus and nuclear membrane:
  + Nuclear membrane surrounds the nucleus and is made of 2 layers (like cell membrane)
  + Pores (holes) allow for some substances to get in and out of the nucleus but not all (semi-permeable)
  + Nucleolus: Dark/dense region of nucleus where DNA is often concentrated.
* What cells have a nucleus?
  + Only eukaryotes.

**CHLOROPLAST**



<http://en.wikivisual.com/images/1/11/Chloroplast-new.jpg>

* Functions:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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* Structure:

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* What cells have chloroplasts? What about chlorophyll?

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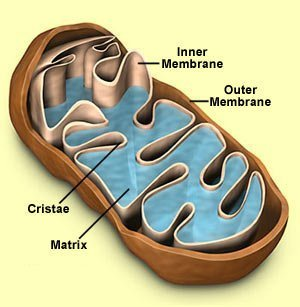
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* If a cell can make its own food what is it called?

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* Functions:
  + Take in water, carbon dioxide, and sunlight
  + Produce glucose (food) for cells and oxygen as a byproduct.
* Structure:
  + Three membrane layers
  + Inner most layer (3rd layer) stacked like coins or pancakes)
* What cells have chloroplasts? What about chlorophyll?
  + Chloroplasts = plants and some protists
  + Chlorophyll = plants and some protists (in the chloroplasts) as well as some bacteria and algae (without the chloroplast)
* If a cell can make its own food what is it called?
  + Autotrophic

**MITOCHONDRIA**



<http://giantshoulders.files.wordpress.com/2007/10/mitochondria.jpg>

* Functions:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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* Structure:

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* What cells have mitochondria?

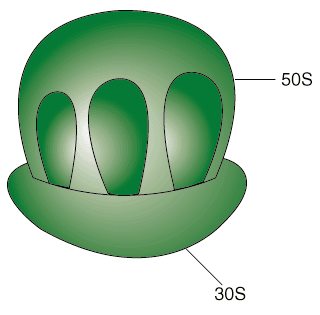
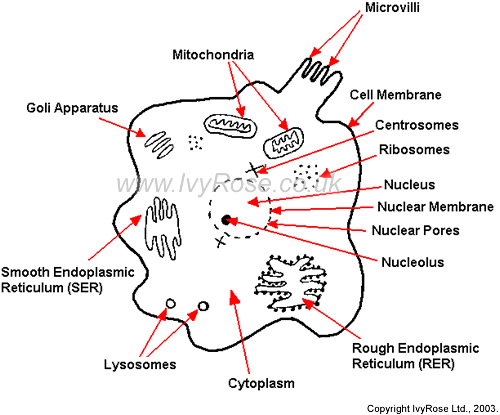
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* How do cells without mitochondria get energy?

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* Functions:
  + Breaks down glucose (food)
  + Produces energy for the cell.
* Structure:
  + Rod-like organelle (oval)
  + Has 2 membrane layers
    - Inner membrane is folded
* What cells have mitochondria?
  + Only eukaryotic cells
* How do cells without mitochondria get energy?
  + They have a more simplified process that does not require mitochondria.

**RIBOSOME**

<http://img.sparknotes.com/figures/F/f88cd44dc6a50ffa6b94cdb9d213894e/ribosome.gif>

* Functions:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Structure:

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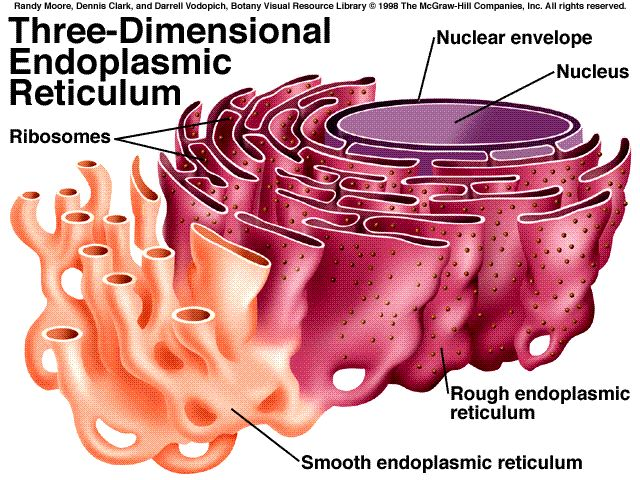
* What kind of cells have ribosomes?

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* Functions:
  + Produce proteins for the cell.
* Structure:
  + Made of 2 parts
  + DO NOT have a membrane around them.
  + Very small in comparison to other organelles.
* What kind of cells have ribosomes?

ALL cells (both prokaryotes and eukaryotes)

**ENDOPLASMIC RETICULUM**



<http://www-1.unipv.it/webbio/anatcomp/freitas/2006-2007/smooth%20&%20rough.jpg>

* Functions:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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* Structure:

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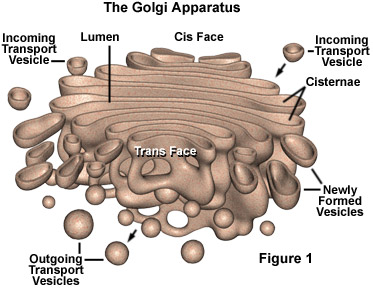
* What types of cells have endoplasmic reticulum?

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* Functions:
  + Overall: produce substances and transport them to other cell parts (often the golgi appartus)
  + SMOOTH: produce lipids and phospholipids
  + ROUGH: produce proteins (due to presence of ribosomes)
* Structure:
  + Interconnected network of tubules and vesicles.
  + Membrane bound with the same type of membrane as other membrane bound organelles (and the cell membrane)
  + Smooth = has no ribosomes
  + Rough = has ribosomes
* What types of cells have endoplasmic reticulum?
  + All eukaryotes

**GOLGI APPARATUS/BODY**



<http://micro.magnet.fsu.edu/cells/golgi/images/golgifigure1.jpg>

* Function:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Structure:

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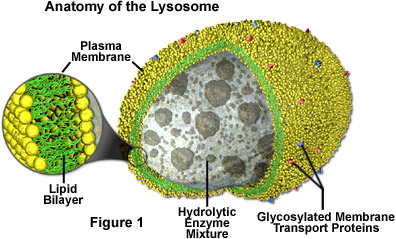
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* What kind of cells have golgi apparatus?

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* Function:
  + Receives and *modifies* substances from other parts of the cell.
  + *Packages* the newly modified materials
  + *Ships* these materials to other parts of the cell or outside of the cell.
* Structure:
  + Stacks of membrane bound sacks.
  + Shape always changing slightly with the pinching off and rejoining of vesicles from other parts of the cell.
* What kind of cells have golgi apparatus?
  + All eukaryotes

**LYSOSOME**



<http://www.molecularexpressions.com/cells/lysosomes/images/lysosomesfigure1.jpg>

* Function:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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* Structure:

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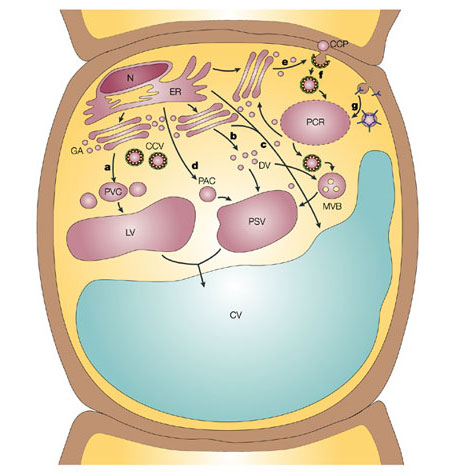
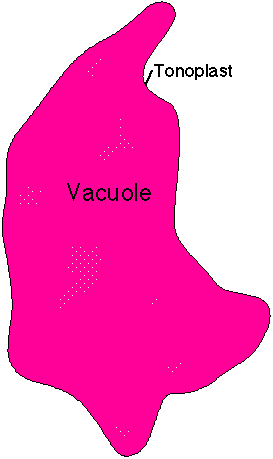
* What kinds of cells have lysosomes?

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* Function:
  + Breakdown large food particles into smaller ones
  + Break down waste/harmful substances
  + Break down old cell parts so pieces can be recycles.
* Structure:
  + Small, round, membrane bound organelle.
  + Contain enzymes that help in breaking down substances.
* What kinds of cells have lysosomes?
  + In eukaryotic cells because they are membrane bound, however they are more typically found in animal cells then other eukaryotic cells.

**VACUOLE**



<http://www.cartage.org.lb/en/themes/sciences/botanicalsciences/PlantsStructure/TypicalPlant/vacuole/vacuole.gif>

<http://www.cepceb.ucr.edu/images/members/raikhel/Fig1_031504.jpg>

* Functions:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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* Structure:

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* What kinds of cells have vacuoles?

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* Functions:
  + Stores water for the cell
  + Stores food for the cell
  + Stores wastes/harmful substances for the cell
* Structure:
  + Depends on the type of cell
    - Plants: usually one large vacuole (can take up to 90% of the cell’s capacity) usually for storing water and dissolved minerals.
    - Animals: multiple smaller vacuoles (each one can store different substances)
* What kinds of cells have vacuoles?
  + Eukaryotes, however the shape and number depend on the type of cell.