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| Organelle | Description | Function | Diagram |
| Nucleus | * The Largest organelle (10-20μm in diameter). * Roughly spherical. * It is double membrane bound | * Contains chromatin – mixture of DNA and associated proteins. * It controls protein synthesis (makes mRNA) * It will always divide before the cell itself divides | cell_nucleus1.gif |
| Nucleolus | * Area of dense chromatin within the nucleus * It is a granular structure and is not membrane bound | * The nucleolus makes ribosomal RNA (rRNA) and assembles ribosomes | [http://t1.gstatic.com/images?q=tbn:ANd9GcSSuOLl9Dn5k4gxNmCUZ3PFnd8GgYAoCXvpcAnKJw20VU6YKSnJhQ](http://www.google.co.uk/imgres?q=smooth+er&um=1&hl=en&biw=531&bih=532&tbm=isch&tbnid=YaORHpG1PJhckM:&imgrefurl=http://wiki.pingry.org/u/ap-biology/index.php/Smooth_endoplasmic_Reticulum&docid=UwQKHUYX3gHADM&imgurl=http://wiki.pingry.org/u/ap-biology/images/8/8e/Smooth_er_em.gif&w=424&h=368&ei=F_RpUND7BoeX1AX9iYCoAg&zoom=1&iact=hc&vpx=27&vpy=2&dur=1105&hovh=209&hovw=241&tx=162&ty=77&sig=112964623004889063272&page=3&tbnh=158&tbnw=182&start=16&ndsp=10&ved=1t:429,r:3,s:16,i:150) |
| Nuclear Envelope | * Double layered membrane * Surrounds the nucleus separating the contents of the nucleus from the cytoplasm. | * Perforated with holes to allow the movement of substances between the nucleus and cytoplasm. | http://t3.gstatic.com/images?q=tbn:ANd9GcQh1W0pEyVTZi9HlJ8McQo2oIntq9SMN8g1htyF2fdspsBveSTV |
| Rough Endoplasmic Reticulum | * Consists of flattened sacs called cisternae * Continuous with the outer nuclear membrane. * Studded with Ribosomes | * The ribosomes make protein which is then transported within the ER’s flattened sac-like sheets called cisternae. * Some of the proteins are secreted by the cell, others are used within the cell. | http://z.about.com/d/biology/1/0/L/1/rougher.jpgcell_er2.jpg |
| Smooth Endoplasmic Reticulum | * Consists of flattened sacs called cisternae * Not studded with ribosomes | * Production of lipids | smooth er [http://t1.gstatic.com/images?q=tbn:ANd9GcSSuOLl9Dn5k4gxNmCUZ3PFnd8GgYAoCXvpcAnKJw20VU6YKSnJhQ](http://www.google.co.uk/imgres?q=smooth+er&um=1&hl=en&biw=531&bih=532&tbm=isch&tbnid=YaORHpG1PJhckM:&imgrefurl=http://wiki.pingry.org/u/ap-biology/index.php/Smooth_endoplasmic_Reticulum&docid=UwQKHUYX3gHADM&imgurl=http://wiki.pingry.org/u/ap-biology/images/8/8e/Smooth_er_em.gif&w=424&h=368&ei=F_RpUND7BoeX1AX9iYCoAg&zoom=1&iact=hc&vpx=27&vpy=2&dur=1105&hovh=209&hovw=241&tx=162&ty=77&sig=112964623004889063272&page=3&tbnh=158&tbnw=182&start=16&ndsp=10&ved=1t:429,r:3,s:16,i:150) |
| Golgi apparatus | * A stack of membrane bound flattened sacs. | * Receives proteins packaged in vesicles from the ER. * Modifies proteins e.g. by the addition of sugars. * Packages modified proteins into vesicles for transportation to the cell surface membrane and secretion out of the cell. | [http://t0.gstatic.com/images?q=tbn:ANd9GcQ636MnBILo0lhdpYY5lF0ri79qKt5pRc40cM7PXDiZNtd_8BQ2](http://www.google.co.uk/imgres?q=golgi+apparatus&um=1&hl=en&biw=531&bih=532&tbm=isch&tbnid=JIRIurcYtAxuKM:&imgrefurl=http://www.kidsbiology.com/biology_basics/cells_tissues_organs/cell_golgi_apparatus_13b.php&docid=vmE2Pec57VWDMM&imgurl=http://www.kidsbiology.com/images/golgi_apparatus3.jpg&w=300&h=200&ei=Q_RpUKSKNsqs0QWay4G4CQ&zoom=1&iact=hc&vpx=2&vpy=192&dur=1401&hovh=160&hovw=240&tx=196&ty=90&sig=112964623004889063272&page=3&tbnh=151&tbnw=240&start=16&ndsp=9&ved=1t:429,r:0,s:16,i:192) [http://t1.gstatic.com/images?q=tbn:ANd9GcQ6Lj4eliuU_f0l9tOCNOmu811XrFkaf-zugxnHTL4V7p_gebbn](http://www.google.co.uk/imgres?q=golgi+apparatus&um=1&hl=en&biw=531&bih=532&tbm=isch&tbnid=XBjJOnRgYn6CPM:&imgrefurl=http://www.sciencephoto.com/media/214898/enlarge&docid=kdyOHeazysIysM&imgurl=http://www.sciencephoto.com/image/214898/large/G4600114-Golgi_apparatus,_TEM-SPL.jpg&w=530&h=367&ei=Q_RpUKSKNsqs0QWay4G4CQ&zoom=1&iact=rc&dur=1&sig=112964623004889063272&page=3&tbnh=149&tbnw=216&start=16&ndsp=9&ved=1t:429,r:5,s:16,i:208&tx=93&ty=82) |
| Ribosome | * Small organelle * Not membrane bound * Consists of two subunits | * The site of protein synthesis. * mRNA from the nucleus is read and used to assemble amino acids. | [http://t1.gstatic.com/images?q=tbn:ANd9GcRk18tWogqooa_BMIOY-PTd62H4GDg5VhiCkAeb8ch3gm1oZhCP](http://www.google.co.uk/imgres?q=ribosome+micrograph&um=1&hl=en&biw=1088&bih=538&tbm=isch&tbnid=ypQ58oO5G4lqVM:&imgrefurl=http://www.sciencephoto.com/media/209669/enlarge&docid=NUyS1ms69CQ5hM&imgurl=http://www.sciencephoto.com/image/209669/large/G1100168-False-colour_TEM_of_ribosomes-SPL.jpg&w=530&h=354&ei=g_RpUNOIH5Sa1AXe3oFw&zoom=1&iact=hc&vpx=336&vpy=240&dur=7802&hovh=183&hovw=275&tx=99&ty=113&sig=112964623004889063272&page=4&tbnh=163&tbnw=212&start=41&ndsp=15&ved=1t:429,r:1,s:41,i:208)cell_ribosome2 |
| Lysosome | * Spherical sacs surrounded by a single layer of membrane. * Contain powerful digestive enzymes. | * Protects the cell from enzymes contained within. * Enzymes are used in the breakdown of materials e.g. cells taken up by white blood cells taken up in phagocytosis. | cell_lysosome1[http://t2.gstatic.com/images?q=tbn:ANd9GcRCboZzAVa6IQlbeTh0tNPZSS65oSVwkrhPNU6UYaauv3l_xT2i](http://www.google.co.uk/imgres?q=lysosome+micrograph&um=1&hl=en&biw=1088&bih=538&tbm=isch&tbnid=WFhGXhfxgLqITM:&imgrefurl=http://missbakersbiologyclasswiki.wikispaces.com/5th+Period's+Cell&docid=8hf6Rzn3fGZMwM&imgurl=http://www.healthvalue.net/files/gaucher.gif&w=600&h=400&ei=HPVpUJv9F5G20QWD84GgDw&zoom=1&iact=hc&vpx=111&vpy=144&dur=2632&hovh=183&hovw=275&tx=142&ty=123&sig=112964623004889063272&page=4&tbnh=155&tbnw=220&start=40&ndsp=15&ved=1t:429,r:10,s:40,i:261) |
| Vesicle | * Membrane bound sac | * Used to move substances around cells. |  |
| Plasma Membrane (Cell surface membrane) | * Present in all living cells * Provides a selective barrier between the cells contents and the external environment | * Controls the passage of substances into and out of the cell . * Regulates the internal environment of the cell. | [http://t1.gstatic.com/images?q=tbn:ANd9GcRLQDf5IN2RZG9Dy1-HOem3F71dp1zZPzlwyo--KC0zYLsFuxiS4Q](http://www.google.co.uk/imgres?q=membrane+micrograph&start=89&um=1&hl=en&biw=1088&bih=538&tbm=isch&tbnid=ECXhb2MFHcKOjM:&imgrefurl=http://www.sciencephoto.com/media/214914/enlarge&docid=JKbgSPPT7HfaSM&imgurl=http://www.sciencephoto.com/image/214914/large/G4600130-Cell_Membrane-SPL.jpg&w=530&h=378&ei=ifZpULGMLMq_0QWByoHIDw&zoom=1&iact=hc&vpx=303&vpy=144&dur=852&hovh=190&hovw=266&tx=83&ty=66&sig=112964623004889063272&page=7&tbnh=161&tbnw=226&ndsp=16&ved=1t:429,r:12,s:89,i:44) |
| Mitochondria | * Spherical sausage shaped organelle formed from two membranes. * The inner membrane is highly folded to form cristae. | * Site of aerobic respiration * Produce adenosine triphosphate (ATP) | mitochondriaemmitochondria |
| Chloroplast | * Found only in plant cells * Two layers of membranes * The inner layer is continuous and forms flattened membrane sacs called thylakoids. | * Site of photosynthesis a process in which Glucose is produced. * Contain chlorophyll: a photosynthetic pigment. | chloroplast[http://t0.gstatic.com/images?q=tbn:ANd9GcQFC30oy8M2dxaP7T6xmXkf80NZOaIfe8dGdwe9h333_SbckrJqww](http://www.google.co.uk/imgres?q=chloroplast+micrograph&um=1&hl=en&biw=1088&bih=538&tbm=isch&tbnid=wcBMIE2qUHaRPM:&imgrefurl=http://www.uic.edu/classes/bios/bios100/lecturesf04am/lect10.htm&docid=epciiife_iCA4M&imgurl=http://www.uic.edu/classes/bios/bios100/lecturesf04am/em-chloroplast1.gif&w=239&h=196&ei=p_VpUKjPBsm80QX6-YGYCw&zoom=1&iact=hc&vpx=229&vpy=207&dur=447&hovh=156&hovw=191&tx=115&ty=76&sig=112964623004889063272&page=1&tbnh=144&tbnw=176&start=0&ndsp=10&ved=1t:429,r:1,s:0,i:85) |
| Cellulose cell wall | * On the outside of the plant cells plasma membrane. | * Supports the cell * Helps maintain sell shape | [http://t2.gstatic.com/images?q=tbn:ANd9GcRnANoOnWKtc4FtNTmz6nz02rjF3lIl88zLLCwCLs08HzJxTLzK](http://www.google.co.uk/imgres?q=cell+wall+micrograph&um=1&hl=en&biw=1088&bih=538&tbm=isch&tbnid=9tKydmJBceVWAM:&imgrefurl=http://doctortee.com/dsu/tiftickjian/plant-anat/cell-wall.html&docid=sCXeOLg4SemezM&imgurl=http://doctortee.com/dsu/tiftickjian/cse-img/botany/plant-anat/cell/microfibrils.jpg&w=380&h=304&ei=6fZpUPrEIoTF0QWVsYCQDg&zoom=1&iact=hc&vpx=236&vpy=149&dur=1961&hovh=201&hovw=251&tx=177&ty=91&sig=112964623004889063272&page=2&tbnh=154&tbnw=192&start=10&ndsp=15&ved=1t:429,r:6,s:10,i:150) |
| Centrioles | * Small tubes of protein fibres. * There is a pair of them next to the nucleus in animal cells and some protocists. | * Take part in cell division. * The spindle fibres used to move chromosomes grow from this organelle. | centrioles |
| Vacuole | * A large membrane bound sac containing water and solutes. * Found in plant cells | * Storage of water and solutes. * Maintenance of cell turgidity. | [http://t2.gstatic.com/images?q=tbn:ANd9GcRCM-QdSqV3FZwWNm7Ip04vzEkTnrAyAPaQQ9UOEv3Ji_rt3YnqQw](http://www.google.co.uk/imgres?q=vacuole&um=1&hl=en&biw=1088&bih=538&tbm=isch&tbnid=HIzWcrqpzL696M:&imgrefurl=http://www.eahall.pvusd.net/staff/levy/PlantCell.htm&docid=lBmsu3NhhB_O3M&imgurl=http://www.eahall.pvusd.net/staff/levy/PlantCell_files/image012.jpg&w=416&h=413&ei=DPZpUMm4IOG50QWLu4GQBw&zoom=1&iact=hc&vpx=113&vpy=199&dur=1321&hovh=224&hovw=225&tx=175&ty=145&sig=112964623004889063272&page=3&tbnh=161&tbnw=162&start=25&ndsp=15&ved=1t:429,r:10,s:25,i:251) |
| Flagella | * Made of protein, these extend from the cell surface. * The Latin term *flagellum* means whip. | * Allow the cell to swim. * Usually found on bacterial cells. * Also sensitive to chemicals and temperatures outside the cell. | http://textbookofbacteriology.net/S.enterica.jpeg |
| Cilia | * Cilia are slender, microscopic, hair-like structures. * They extend from the surface of nearly all mammalian cells. | 2 Types:   * Motile cilia: they have a rhythmic waving or beating motion. These keep airways clear of mucus and dirt, for example. * Non-Motile or Primary cilia. These do not move. Some act as sensory organs for the cell eg in the eye they are found in photoreceptor cells. | http://t0.gstatic.com/images?q=tbn:ANd9GcR4mCjOjo-s-DsIhPwPQ4VbAbPImcfbeiOoUemLWjmiq1q9IW6U |

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| Animal cell  Nucleolus  Nuclear envelope with pores  Rough endoplasmic reticulum  Smooth endoplasmic reticulum  Mitochondrion  Golgi body  Vesicle  Lysosome  Centriole  Nucleus  Cell/plasma membrane |
| Plant cell  Nucleus  Nucleolus  Nuclear envelope with pores  Rough endoplasmic reticulum  Smooth endoplasmic reticulum  Mitochondrion  Golgi body  Chloroplast  Cell wall  Central vacuole |

Cell/plasma membrane