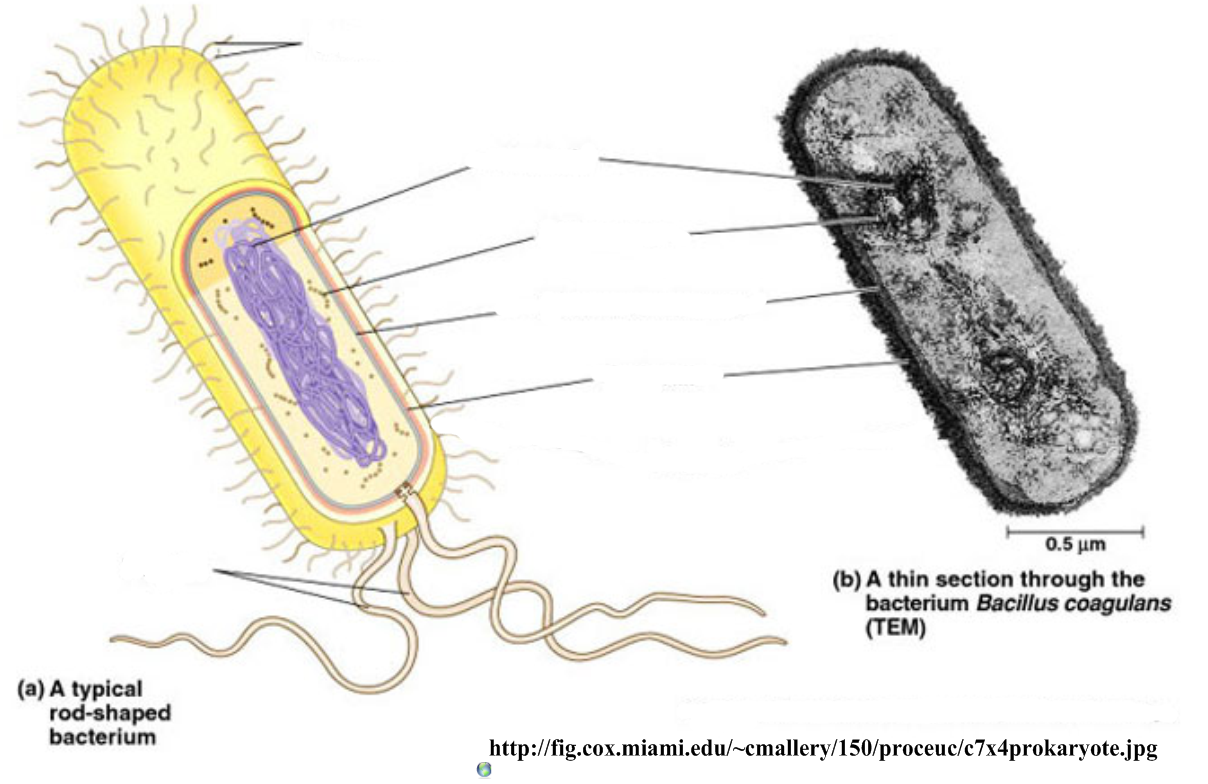
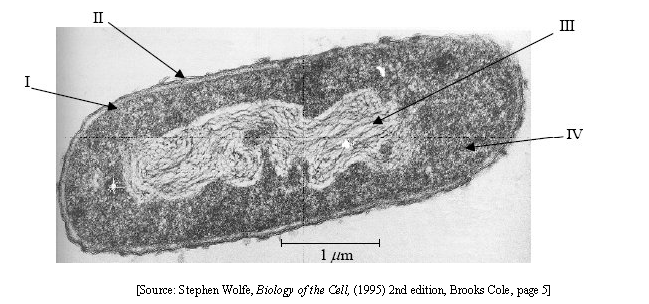
1. *S.typhi* and *Escherichia coli* are examples of prokaryotes.
2. Define *prokaryote*.
3. Draw and label the ultrastructure of a generalized prokaryote. *Include cell wall, plasma membrane, pili, flagella, nucleoid (naked DNA), ribosomes and a scale bar.*
4. State the function of each of the labeled parts.
5. This is an electronmicrograph of the bacterium *Salmonella typhi*.
6. Calculate the magnification of the image.
7. Calculate the length of the cell body.
8. State the name and function of this structure.
9. State the method by which prokaryote cells reproduce.
10. Identify the labeled structures in this diagram and transmission electron micrograph.



1. This image is a transmission electron micrograph of a bacterium.
2. Identify the labeled structures



1. Calculate:
2. The magnification of the image
3. The maximum length of the bacterium.
4. Plant and animal cells are eukaryotic.
5. Define *eukaryot*e.
6. Evidence for Cell Theory: Outline the role of Robert Brown in forming cell theory.
7. Compare prokaryote and eukaryote cells.

|  |  |
| --- | --- |
| **Prokaryote** | **Eukaryote** |
| 70S (small) ribosomes  No mitochondria  Cell parts | 80S (large) ribosomes  True nucleus contains DNA  Organelles in discrete membranes  Internal membranes enclose organelles  10-15µm in diameter |

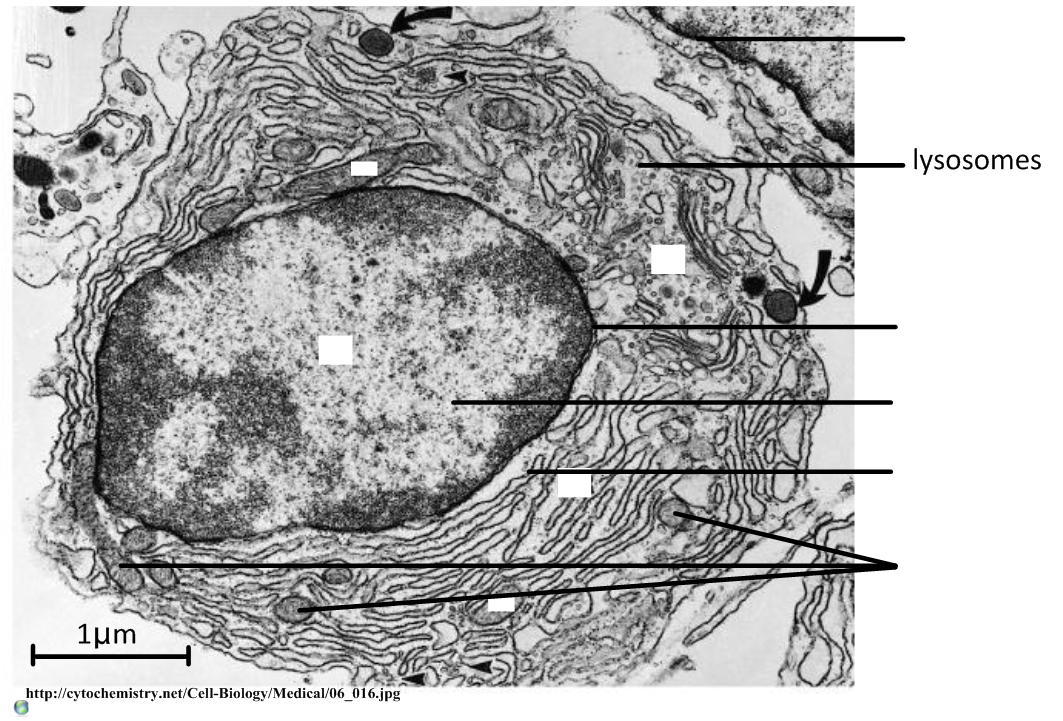
1. Compare the structures of plant and animal cells, using clear, labeled diagrams.

Include *annotations on the functions of each organelle* and *scale bars* to show size.

1. Outline the functions of these eukaryotic organelles:

|  |  |  |  |
| --- | --- | --- | --- |
| **Organelle** | **Structure (description)** | **Function of organelle** | **Draw it** |
|  | Region of the cell containing chromosomes, surrounded by a double membrane, in which there are pores. | Storage and protection of genetic information on chromosomes. |  |
| Ribosome | Small spherical subunit consisting of two subunits, some attached to membranes, others free. |  |  |
|  | Spherical organelles surrounded by a single membrane, containing hydrolytic enzymes. | Digestion of structures ad molecules that are not needed in the cell. |  |
|  | Organelles surrounded by two membranes, the inner of which is folded inwards. |  |  |
|  | Double-membrane containing layers of membranes (thylakoid stacks) and the pigment chlorophyll. |  |  |
|  | Large, folding membrane structure found close to the nucleus, with ribosomes attached to some surfaces. |  |  |
|  | Large, folded membrane structure found close to the plasma membrane, often with vesicles budding off the outer edge. |  |  |

1. The image below shows a TEM micrograph of a liver cell.
2. Identify the labeled structures.



1. Calculate the magnification of the image.
2. Calculate the maximum diameter of the nucleus.
3. *Extracellular components* are materials or structures which extend beyond the plasma membrane. Outline the role of an extracellular component in a *plant cell* and an *animal cell*.

*Plant:*

*Animal:*

1. Specialised cells are adapted to suit their function.
2. In the space below, draw and label three specialized cells (two animal, one plant), outlining the relationship between *structure and function* in each case.

|  |  |
| --- | --- |
| **Diagram** | **Structure vs function** |
|  |  |
|  |  |
|  |  |

1. Explain how cells differentiate from stem cells to become specialized.