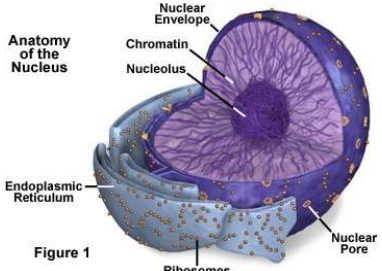
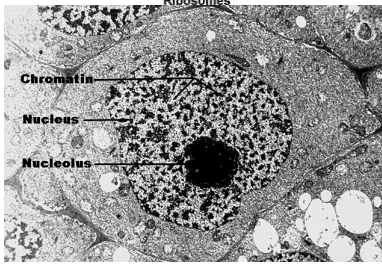
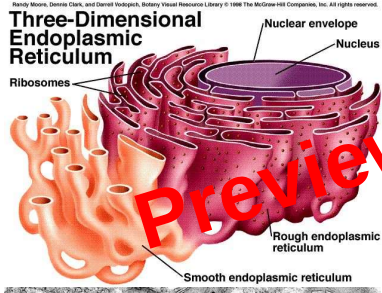
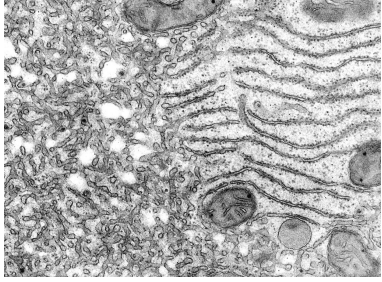


Cell Organelles

Sunday, 13 July 2014 9:41 AM

Describe and interpret drawings and photographs of typical animal and plant cells as seen under the electron microscope, recognising the following membrane systems and organelles: rough and smooth endoplasmic reticulum, Golgi body, mitochondria, ribosomes, lysosomes, chloroplasts, cell surface membrane, nuclear envelope, centrioles, nucleus and nucleolus. (Knowledge of the principles of TEM and SEM are not required.) (For practical assessment, students may be required to operate a light microscope, mount slides and use a graticule.)

Outline the functions of the membrane systems and organelles listed in (a).

Organelle	Structure	Function
Nucleus  	Largest organelle within the eukaryotic cell; spherical or ovoid in shape Nuclear envelope - Double-membrane bound - Outer membrane fused with <i>rough endoplasmic reticulum</i> - Presence of <i>nuclear pores</i>, which act as channels whereby molecules can move between the nucleus and cytoplasm Nucleoplasm - Semi-fluid matrix that fills the nucleus Chromosome/Chromatin - Most DNA is located here and are organised with proteins called <i>histones</i> - Chromatin - highly elongated threads of DNA - form chromosomes during nuclear division - Number of chromosomes in the nucleus varies according to species of organism Nucleolus - One or more may be found - Responsible for the synthesis of <i>ribosomal RNA (rRNA)</i>	- Contains hereditary material - Essential for cell division - Controls and directs activities within the cell by regulating protein synthesis
Endoplasmic Reticulum  	Rough Endoplasmic Reticulum - Originates from outer membrane of nuclear envelope - Consists of a network of flattened membrane-bound sacs called <i>cisternae</i> (cisternae with ribosomes attached on the outer surface) - Typically appears as pairs of parallel lines running through the cytoplasm Smooth Endoplasmic Reticulum - Consist of a series of interconnected tubules - Lack ribosomes Internal cisternae of both endoplasmic reticulum are continuous	Rough Endoplasmic Reticulum - Proteins are synthesised by attached ribosomes and are transported through cisternae to their destinations or packaged in vesicles and dispatched to other parts of the cell or across the membrane (exocytosis) Smooth Endoplasmic Reticulum - Folding and modification of proteins here - Synthesis of lipids - Metabolism of carbohydrates - Detoxification of drugs and poisons - Storage of calcium ions for contraction in muscle cells
Ribosome	Composed of ribosomal RNA and ribosomal protein to form a ribonucleoprotein	Site of protein synthesis