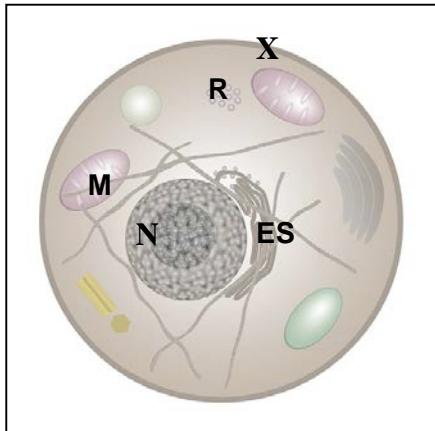


The key: 7.013 Recitation 1 – Spring 2018

1. The following is the schematic of a cell.



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a) Does the schematic represent a prokaryotic or a **eukaryotic** cell? **Note:** Does the cell have a nucleus and membrane bound organelles?

b) Put an “X” on the plasma membrane.

c) Put an “N” on the organelle that has the genome.

d) The Mitochondrion (shown as M) produces **ATP**, which is the energy currency of the cell.

e) The endomembrane system (shown as ES) is comprised of **ER**, **Golgi** and **Lysosomes**.

f) **Circle** the correct option(s). Ribosomes (shown as R) are involved in **DNA/protein** synthesis. They are found in **cytoplasm/nucleus/nucleolus/ER/Golgi/Mitochondria**.

g) **Autophagy** is the process of **orderly degradation and recycling of cellular components** and it occurs in **lysosomes**.

2. Answer the questions using the following keywords: *Extracellular matrix (ECM), nucleus, mitochondria, organelles, cytoskeleton, cytosol, plasma membrane, endoplasmic reticulum (ER), lysosomes, prokaryotic, eukaryotic, nucleolus, ribosomes, Nuclear membrane, RNA, DNA, proteins*

a) A component of the cell that is involved in the synthesis of ribosomes. **Nucleolus**

b) Composition of ribosomes: **RNA (or rRNA) and proteins**

c) A dynamic fibrous network that maintain cell shape and motility and participates in intracellular transport and cell division. **Cytoskeleton**

d) Filamentous structure that is present in between TWO cells and provides them with anchorage and is involved in intercellular communication. **ECM**

e) Organisms that do not contain a nucleus. **Prokaryotes**

f) Locations of the enzymes that digest the toxic substances produced within a cell. **Lysosomes**

g) Location of a protein that transports water in and out of cells. **Plasma membrane**

h) Part of eukaryotic cell where DNA is synthesized and stored. **Nucleus (and mitochondria)**

3. You label a eukaryotic cell with a nonradioactive chemical that specifically binds to its DNA. You remove the nucleus of this cell. Would you expect to see any label in the cell **AFTER** its nucleus has been removed? Why or why not?

Yes, the genomic DNA is in the nucleus but the mitochondria (and chloroplasts in plants) also contain the DNA. You will see the label due to mitochondrial DNA.

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