

CHEM1200 Tutorial 1: Biology of Cells & Microbiology

(I) Concepts to review:

1. Organization of biological systems
2. Light vs. electron microscopy
3. Characteristics of different cell types (prokaryotic/eukaryotic; plant/animal; etc.)
4. Characteristics of different microbial species (virus/bacteria/yeast etc.)

(II) Exercise:

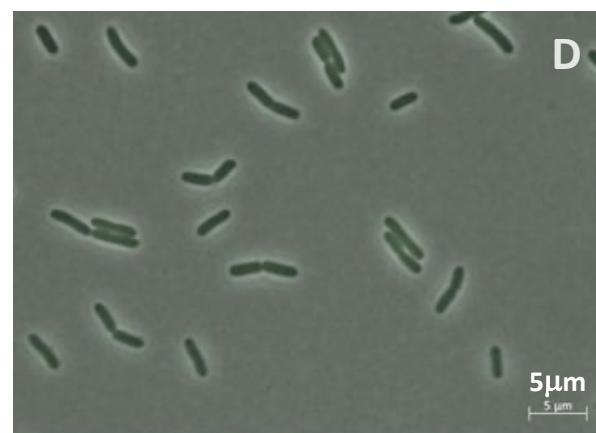
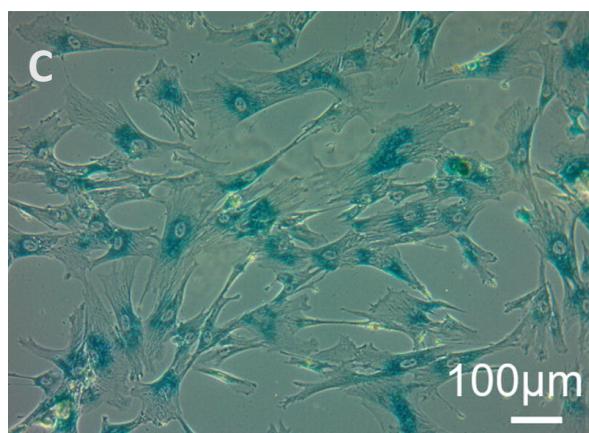
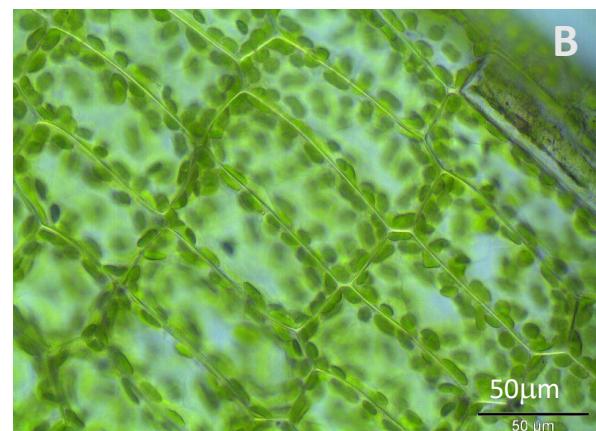
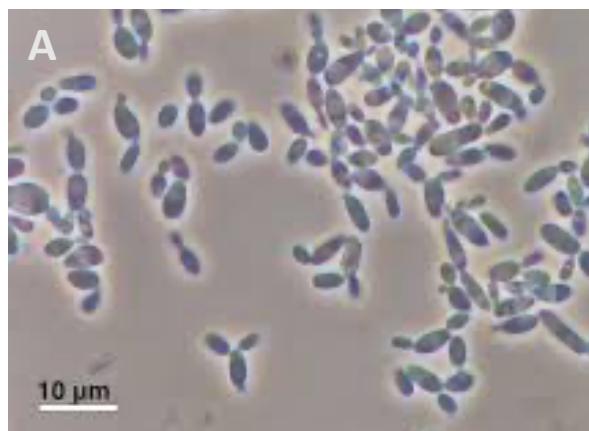
1. Complete the following table by writing the name of the cell organelle in the right hand column that matches the structure/function in the left hand column.

| Structure/Function | Cell Part |
|--|------------------|
| Stores material within the cell | |
| The sites of protein synthesis | |
| Organelle that manages or controls all the cell functions in a eukaryotic cell | |
| The membrane surrounding the cell | |
| Contains chlorophyll, a green pigment that traps energy from sunlight and gives plants their green color | |
| Digests excess or worn-out cell parts, food particles and invading viruses or bacteria | |
| Firm, protective structure that gives the cell its shape in plants, fungi, most bacteria and some protists | |
| Produces a usable form of energy for the cell | |
| Packages proteins for transport out of the cell | |
| Transports materials within the cell | |
| Longer whip-like structures used for movement | |
| Small hair-like structures used for movement or sensing things | |
| Site where ribosomes are made | |
| Consist of tubes that provide support for the cell and tracks for organelles and vesicles to move on | |

2. You are given four plates, each contains cells from a different organism. One plate contains **bacterial** cells, one contains **yeast** cells (eukaryotic), one contains **human** cells, and one contains **plant** cells.

A. You are given a simple light microscope. What characteristics will you look for to identify each cell type? Explain your answer.

B. You look under the light microscope and see the following images. Notice the scale bar in each image. Label the cell type as best as you can.



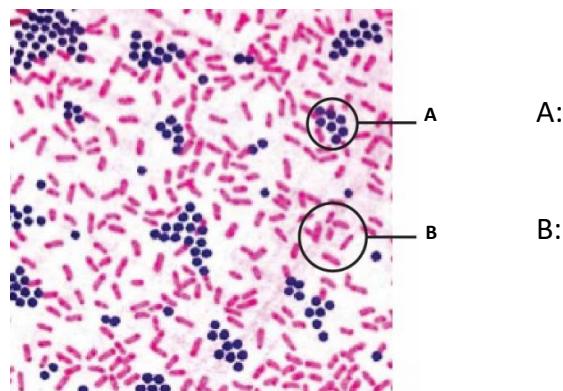
A:

B:

C:

D:

3. Describe the bacteria indicated in the following microscopy image by their gram staining status and shape:



4. Which of the following sequences is the best representation of the organizational hierarchy (from complex to simple) found in an individual animal?

- A. Brain, Cerebellum, Nerve cell, Nervous tissue
- B. Cerebellum, Nervous tissue, Molecule, Cell
- C. Organism, Organ system, Tissue, Cell, Organ
- D. Nervous system, Nerve cell, Brain, Cerebellum
- E. Nervous system, Cerebellum, Cell, Molecule