

# Midterm Exam: Microbiology MGHHP

**There are 5 parts to this exam.**

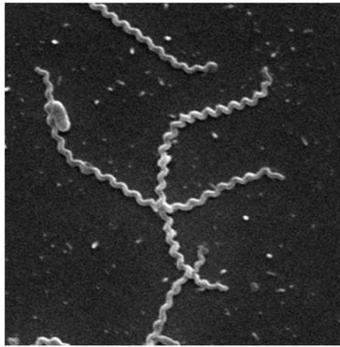
**Submit your answers on either a .docx or .pdf document.**

**You should cite sources you used at the end of each section. All answers must be in your own words! Do not use quotes or images from other sources.**

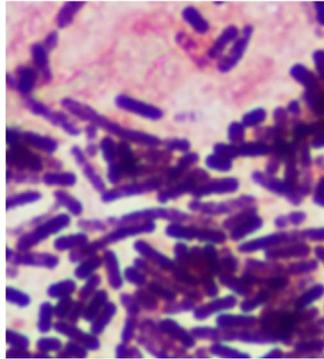
**Work on this assignment independently and do not post any questions to sites like Chegg, Quizlet, etc. Posting these questions to outside sources will be considered cheating.**

**Part 1. Identify cell features through microscopy and cellular features:** For each micrograph, describe the type of microbe as:

- (A) Bacteria, Virus, or Protozoa (you will **not** be able to identify genus or species from these images; do not use a reverse image search to find answers)
- (B) Describe the cell features that led you to this answer
- (C) Include cellular features that can be identified from this image. Think about what you can tell about the cell from the image.



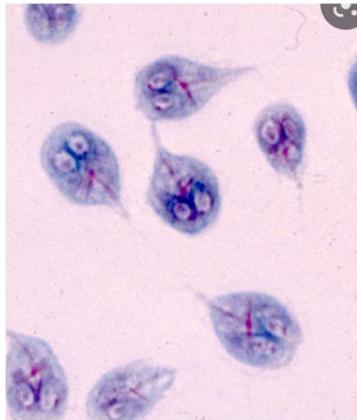
3. Dark-field micrograph (1000x)



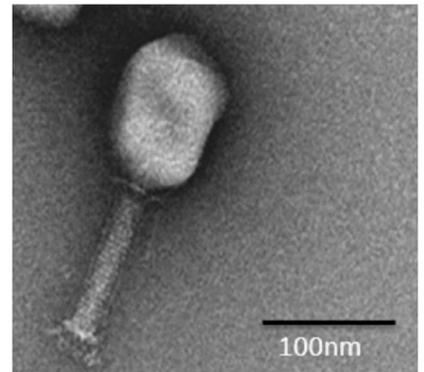
4. Gram Stain: Light Microscope (1000x)



2. Endospore stain: Light Microscope (1000x)



1 Trichrome Stain: Light Microscope (100x)



5. TEM (see bar for sizing)

**Part 2. Growing bacteria in the lab:** For each of the following bacteria, discuss the conditions that would be needed for growth in the lab. Include all the physical and chemical requirements discussed in the lecture slides.

1. *Escherichia coli*
2. *Clostridium botulinum*
3. An environmental bacteria isolated from marine sediments from the Massachusetts coastline in March
4. *Mycobacterium tuberculosis*

**Part 3. Constructing a growth curve:** using the following data (you can draw the curve or produce a graph on excel or google sheets). Make sure to label the x- and y-axis, and the different stages of the growth curve. You need to account for the dilution (do not just use the numbers provided).

	CFU counted from a plate with a 1:100 dilution of a 1ml solution
24 hours	25
36 hours	45
48 hours	55
72 hours	55
96 hours	55
120 hours	20
142 hours	10
164 hours	1
200 hours	1

**Part 4. Viral Replication:** Select a human virus:

- (A) Identify the type of virus (type of genetic material, presence of an envelope, any other unique features)
- (B) Discuss the type of cells it infects
- (C) Describe the replication cycle (use a numbered list to describe each step)

**Part 5. Epidemiology:** Choose an infectious disease and describe it using the following epidemiological criteria. You will need to use outside sources for this:

- (A) Transmission method
- (B) Incubation period
- (C) Incidence and Prevalence (within the US or global; you can pick, but be sure to indicate which population you are looking at)
- (D) Severity of disease (use the terms from the lecture)
- (E) Predisposing Factors/Population at Risk