

# Final Exam

---

Name:

Matriculation Number:

This course has focused on developing your writing skills when using scientific English. Consequently, we will grade your answers not only on correctness, but also on your grammar and use of correct expressions when writing your answers. Please ask us if you have any questions.

## *Section 1: Listening Comprehension (35 points total)*

This listening passage can be found at  
([http://www.ted.com/index.php/talks/laurie\\_garrett\\_on\\_lessons\\_from\\_the\\_1918\\_flu.html](http://www.ted.com/index.php/talks/laurie_garrett_on_lessons_from_the_1918_flu.html))

Answer the following questions about this short passage. Please listen carefully, as we will only play the passage once. Answer in complete sentences.

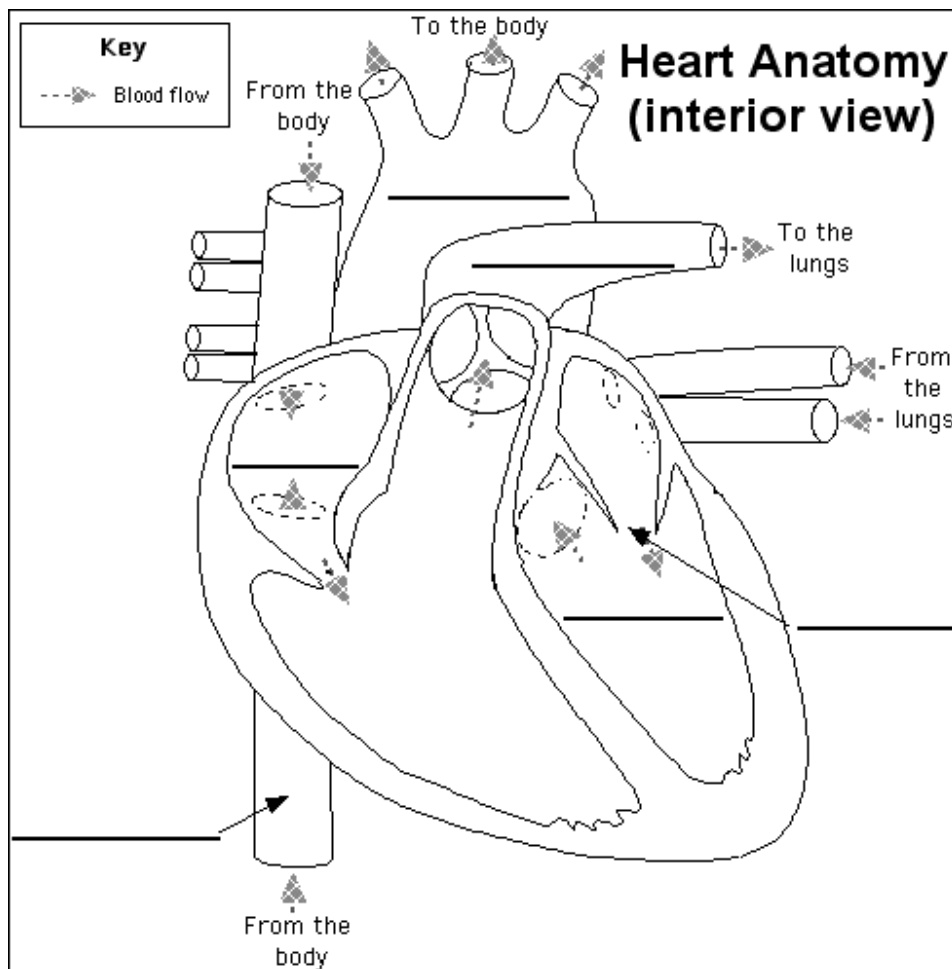
1. Why are pandemics a greater threat in today's world than they previously have been? Is preventing international a good way to prevent the spread? Why/why not? (7 pts)
  
  
  
  
  
  
  
  
  
  
2. Explain some of the risk factors of the H5N1 flu. What specific factors make H5N1 so deadly? (7 pts)
  
  
  
  
  
  
  
  
  
  
3. You are a member of your town council. Since you are the only biologist on the council, they ask you for help during the next pandemic. Describe two measures that you would implement and explain why. (10 points)

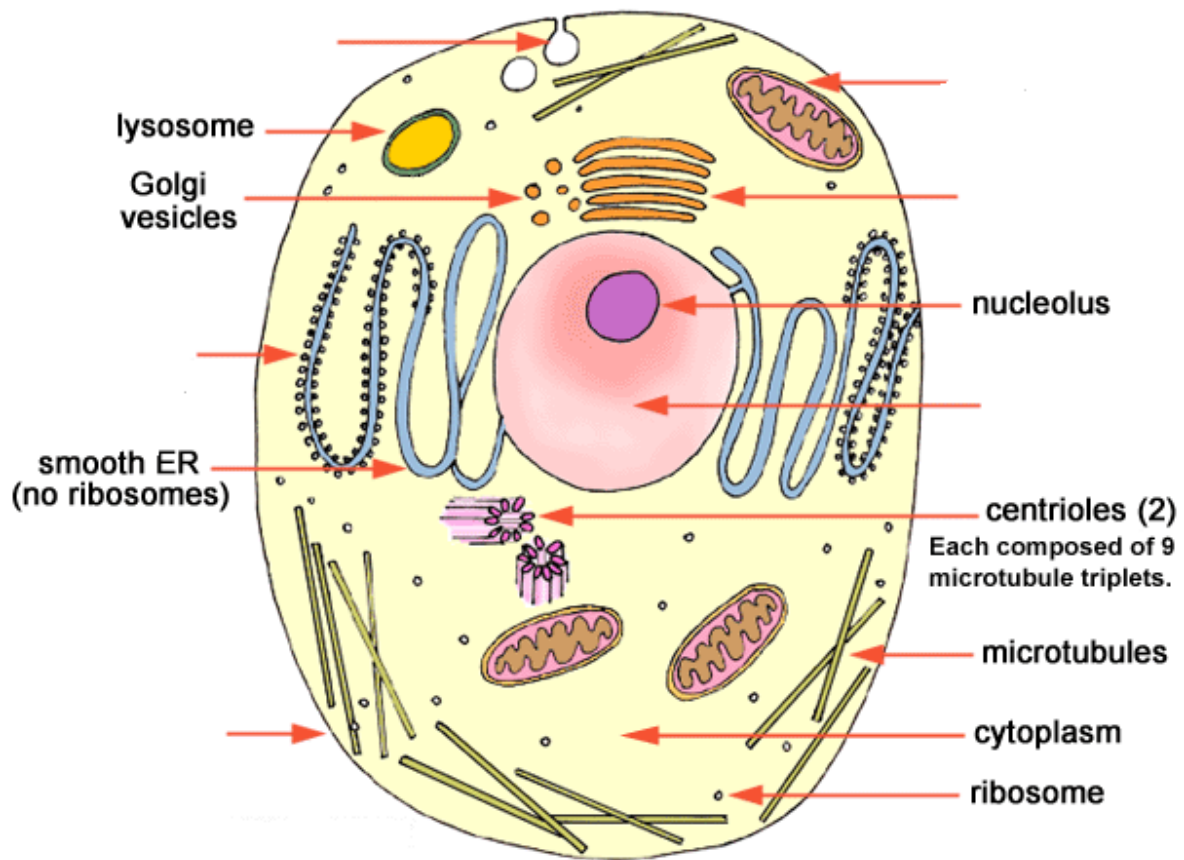
4. Why was the second wave of the 1918 flu so much more deadly? Whom did it target? (6 pts)

5. What is the intended audience of this presentation? Suggest an appropriate title. (5 pts)

*Section 2: Vocabulary (30 pts total)*

1. Please label the following structures, using the vocabulary we have learned in class (12 pts)





2. Fill in the Blank (12 pts)

1. \_\_\_\_\_ are small particles which contain nucleic acids surrounded by a \_\_\_\_\_, which is shell composed of proteins. \_\_\_\_\_, such as those against Hepatitis C and chickenpox, can provide the body with \_\_\_\_\_.
2. If the body's oxygen supply is depleted, cells will begin \_\_\_\_\_. In humans, this process breaks \_\_\_\_\_ down to \_\_\_\_\_, which is the product that makes your \_\_\_\_\_ sore after exercising.
3. There are three phases of matter: solid, \_\_\_\_\_, and gas. Most common elements, especially metals, are \_\_\_\_\_ at room temperature, but they will \_\_\_\_\_ if heated. The most important element in the human body is \_\_\_\_\_.

3. State some characteristics of acids and bases in the correct columns. (6 pts)

<b>Acids</b>	<b>Bases</b>

*Section 3: Reading Comprehension (35 pts total)*

*Techniques in the Study of Cell Structure*

Microscopic anatomy can be divided into two main parts: the study of tissues taken after death and the study *in vivo* or *in vitro* of living tissues. In the study of tissues taken after death the use of stains is of fundamental importance. Because particular types of cells and structures within the cells attract particular dyes, the physical characteristics of many cellular elements is easily differentiated. Structures which are invisible because their refractility equals that of their surrounding medium may often be defined by staining.

Histochemistry is the study of the chemical constituents of cells and tissues, its distribution and function. It depends in large part on the use of selective stains. For example, acid substances in the nucleus of a cell attract basic dyes. It is said that these acids have the property of basophilia. Further distinction can be made between deoxyribonucleic acid and ribonucleic acid. The former can be traced by the Feulgen Method, while the latter reacts with an enzyme. Spectrographic methods can be used to determine the quantity of these chemicals and changes in their distribution during cell activity. Rates of absorption, solubility and actual chemical combination provides valuable data. In addition to selective staining, it is possible to study certain tissues with the help of metallic salts. Some elements attract deposits of these salts, but since reagents act both by staining and by impregnation with deposits, it is difficult to separate the two processes.

Tissues fixed and stained after death are usually studied in the form of film preparations or sections. The specimen is freezeed or sealed in paraffin or celloidin. A microtome is used to cut the extremely thin sections required for microscopic examination. The preparation of a microscopic section necessarily involves some distortion of the cell from its living counterpart.

Histological techniques involved in the investigation of the detailed anatomy of organs and tissues and especially of embryonic development often depend on the use of serial sections and enlarged models reconstructed from the sections. Serials sections can be prepared of embryos at different stages of development. Each series of sections records one particular phase. When placed in order the series shows the progressive elaboration of an embryo at different ages. Large scale models can then be made of each section and these can be fitted together to give a three-dimensional reconstruction of the embryo.

1. What is the intended audience of this article? Whom do you think the author was writing for? (5 pts)
2. Why might some structures be invisible, and how could they be visualized? (5 pts)
3. If you wanted to stain the nucleus of a cell, would you use benzoic acid (pH<7) or would you use DAPI (pH >7)? Why? (10 pts)
4. Describe, in your own words, how to construct a model of an embryo from tissue sections. (10 pts)
5. Find five grammatical mistakes in the above passage and underline them. (5 pts)

*Extra Credit (+2 points per correct answer)*

1. Give a few reasons for why cholera spread through London so quickly in the 19<sup>th</sup> Century. Use complete sentences.
2. Why are sewer covers round?