

# Our Secret Universe

## The Hidden Life of the Cell

Name\_\_\_\_\_

### Introduction to the Cell

For each of the structures of the cell given in this part of the documentary, explain its purpose.

| Structure / Organelle   | Function |
|-------------------------|----------|
| Cytoskeleton (proteins) |          |
| Mitochondria            |          |
| Nucleus                 |          |
| DNA                     |          |
| Ribosomes               |          |
| DNA Polymerase Enzyme   |          |
| Proteasome              |          |

### Cell Infection

1. What exactly do white blood cells “inspect” to be sure that a cell belongs and is not infected?
2. What is the body’s first line of defense against pathogens? What are the weak points in this defense?
3. Describe what the antibodies do to interfere with the invasion of viruses.
4. What are two functions of the protein receptors covering the cell membrane?
5. How does the adenovirus use protein receptors to enter the cell?
6. Describe an argument **for** and **against** viruses being classified as “living”.
7. What are endosomes, and how do they affect the viruses within the cell? Which viruses are able to escape?

8. Most viruses helplessly float in the cell at this point. What are they unable to do as a result of their simple design?
  - a. What structure in the cell can the virus use to move it to the nucleus?
9. How does the cell use proteasomes as a last line of defense against the virus?
10. The virus must pass through nuclear pores in order to access the DNA inside the nucleus. Explain how it accomplish this in spite of being physically larger than the pores.
11. What does the virus do once it gains access to the cell's DNA?
12. What last resort does the cell have to defend the surrounding tissue from the virus?
13. What happens to the cell itself once all its processes are focused on building new viruses?
14. Why are viruses able to recognize a host cell, enter its membrane, and take over?
15. What does the Adenovirus death protein do?
16. Describe what response the body has once the viruses begin escaping the dead cell.
17. How is the body able to prevent future infections by the same virus?
18. Explain how viruses, over time and evolution, have actually made cells stronger and better.