

Case Studies in Microscopy

Name _____

The Fatal Flu

The purpose of this activity is for you to use the information presented in the results and the references to determine the cause of an outbreak. Think about the information, and answer these questions as you go through case. (max. length = 2 pages)

Part 1: The Disease

1. What types of pathogens could be responsible for this seemingly fatal flu? (1 pt)

Part 2: The Gram Stain Results

- 2a. The Gram stain uses light microscopy. Of the potential pathogens you listed in question 1, which ones could be seen in a Gram stain? What could you NOT see? (1 pt)
- 2b. How big is the typical bacterial cell? How big are the cells you see in the patients' results? Are those cells likely bacteria? Why or why not? (1 pt)

Part 3: The Direct Fluorescent Antibody Results

- 3a) The direct fluorescent antibody assay is useful because it allows one to look for the presence of specific pathogens. What makes this technique so specific? (1 pt)
- 3b) What do the DFA results indicate about what might be causing this disease? (1 pt)

NOTE: it may help you to fill in the test results below.

	Human RSV	Rhinovirus	Influenza	Human Adenovirus
Patient 1				
Patient 2				
Patient 3				
Patient 4				

Part 4: The Electron Microscopy Results

- 4a) What is one advantage of using electron microscopy over the DFA? What is one disadvantage? (1 pt)
- 4b) What do the EM results indicate about what might be causing this disease? (1 pt)

NOTE: it may help to fill in the test results below.

	Cell line A	Cell line B	Cell line C
Patient 1			
Patient 2			
Patient 3			
Patient 4			

Part 5: Your Conclusion

- 5a) What is causing the Fatal Flu? **Explicitly state what you think is causing the outbreak and present evidence that supports your hypothesis.** Your argument must refer to your results and include information from the references as needed. (2 pts)
- 5b) **Describe one more diagnostic test** that you could you perform on the sputum samples to further confirm your suspicions about the pathogen. NOTE: Assume that you cannot purposefully infect humans. (1 pt)